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Dynamic Employee Stock Options

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Abstract

In this paper, we introduce a new type of employee stock options – dynamic employee stock options (DESOs). A cost-benefit analysis of DESOs is conducted against traditional employee stock options (TESOs). The results indicate that DESOs have many advantages over TESOs while they only cost the firm 4% more. We suggest that firms should choose DESOs over TESOs for the best interests of both the employers and the employees.

Keywords: *dynamic employee stock options, traditional employee stock options, cost-benefit analysis.*

1. Introduction

A traditional employee stock option is a non-standardized call option on the common stock of a company issued to an employee as a form of non-cash compensation. There are normally restrictions on the option, such as vesting and limited transferability that attempt to align the option holder's interest with those of the shareholders. A company issues employee stock options (ESOs), which can be exercised at a particular price, to an employee. The price is generally the company's stock price set on the grant date. The employee may exercise the option at some point after the vesting period, obligating the company to sell its stock to the option holder at the exercise price. The employee can then sell the stock to pocket profits, or hold on to it in the hope of further price appreciation, or hedge the stock position by selling listed call options or buying listed put options. The employee may also choose to hedge the ESOs prior to exercise with listed calls and puts to avoid forfeiture of time premium of the option back to the company and to reduce risks and delay taxes (Olagues & Summa, 2010).

The value of an ESO can be obtained using the same models used in valuing standardized options, such as Black-Scholes and the binomial lattice model. Hull and White (2004) were the first to value employee stock options for public companies using binomial lattice models. In their *Journal of Accountancy* article,

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Sellers et al. (2008) proposed a combination of binomial lattice model and bisection method to value employee stock options for private companies. Cvitanić et al. (2008) derived an analytical formula to price employee stock options. Leung and Sircar (2009) presented a valuation framework that captures characteristics of employee stock options, such as risk aversion, job termination, vesting, and multiple exercises. León and Vaello-Sebastià (2009) implemented a simulation-based approach for the valuation of employee stock options. Aboody et al. (2010) investigated firms' operating performance subsequent to the repricing of employee stock options and found that repricing has a larger increase in operating income and cash flows in subsequent periods.

Carpenter et al. (2010) conducted a comprehensive study of optimal exercise policy for employee stock options. In their *Journal of Banking & Finance* article, Palmon et al. (2008) evaluated the common practice of setting the strike prices of executive option plans at-the-money and simulated that it is optimal to award managers with options that will most likely to be highly valuable at expiration. Hand (2008) examined employee stock options in private entrepreneurial companies and found that 27% of U.S. venture-backed firms do not grant stock options to all employees. Also, Hayes et al. (2012) provided new evidence on the relation between option-based compensation and risk-taking behavior by exploiting accounting treatment of employee stock options. By analyzing the sensitivity of employee stock options to return volatility, Armstrong and Vashishtha (2012) found that stock options might not always encourage managers to pursue projects that are characterized by idiosyncratic risks.

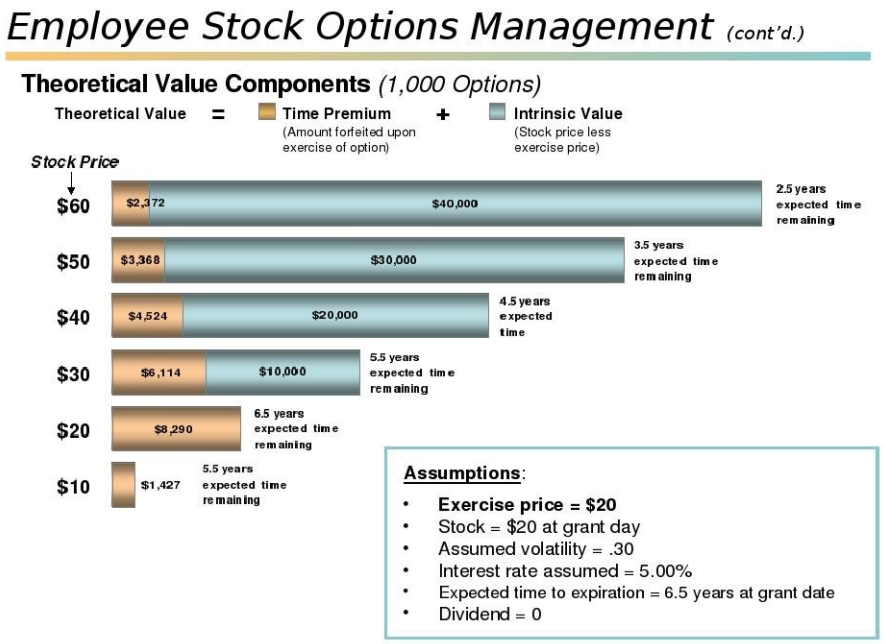

Figure 1. Time value and intrinsic value of ESOs

The majority of public and private companies apply the Black-Scholes model due to its simplicity. However, many companies start to apply the binomial lattice model. The value of an ESO consists of intrinsic value, which is the maximum of (stock price – exercise price) and 0, and time value. The time value of options is defined as the difference between the option price and intrinsic value. Intrinsic value is the difference between stock price and strike price if the option is in-the-money (i.e., stock price is greater than strike price), or zero, if the option is at-the-money (i.e., stock price is equal to strike price), or out-of-the-money (i.e., stock price is less than strike price). Figure 1 illustrates the concept of time value and intrinsic value, and how the two change with stock price and time to maturity.

Figure 2 is almost identical to Figure 1 except we separate the intrinsic value into two parts: one part that is paid as tax and the other part that the employee takes home after tax.

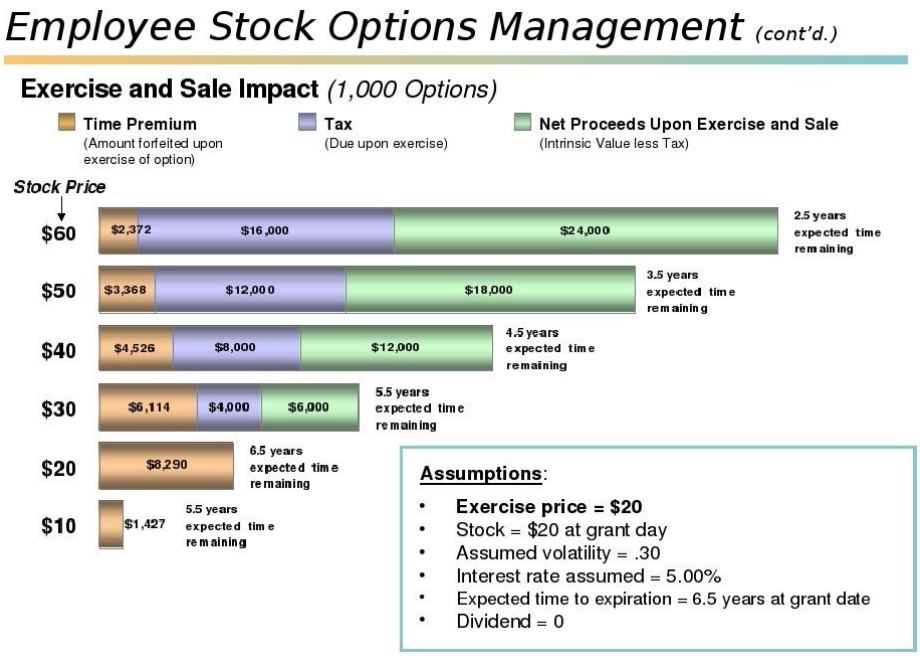

Figure 2. Time value, intrinsic value, and taxation of ESOs

2. Google Transferable Options

On December 12, 2006, Google announced that they would make certain employee stock options granted to non-executives to be transferable after vesting (Brown, 2006). In a release Google answered some questions, two of which are given below:

- "Why did Google create this program?" Google replied: "We want to permit Google employees to capture the 'time value' of their options.

Because the current option program does not allow the sale of employee stock options, employees are able to realize value from the options only by exercising them and then selling the stock at a price higher than the exercise price. With this program, employees will be able to realize not only the intrinsic value (the difference between grant price and market price for Google stock), but also the time value of their options. Financial institutions such as banks may be willing to pay a premium above the intrinsic value for many options because of the time value."

- "What is time value?" Google replied: "Time value is the value of the right to continue holding an option for potentially greater gains at a later date".

The Google Transferable Plan was established in April 2007 and had several provisions in it which affected the value that the employees would receive upon sale to four bidding banks arranged by Morgan Stanley. The two most important provisions were that (a) if the employee owned employee stock options with expiration dates of two or more years from the time of sale, the bidding buyers would, upon the purchase, own Transferable options with just two years to expiration; and (b) the bidding buyers must hold the Transferable options until expiration but could hedge their positions by selling calls and shorting stocks.

These two provisions made the bidders bid substantially less for the ESOs than the "fair value" of the employee stock options and made the net proceeds to the sellers to be lower. It is generally believed that the Google Transferable Plan is not a success. It is not a success because most employees do not think the "time value" that they "capture" is adequate, and hesitate to use it unless the ESOs are deep in-the-money, with very little time value remaining.

Since the employees generally considered substantially out-of-the-money ESOs worthless, they sold much of their out-of-the-money ESOs just to get the small amounts and lost all alignment with the company from those options and perhaps their opportunity to participate in the re-pricing of the ESOs that took place in March 2009.

If the employees sold in-the-money ESOs to the bidders, there would have been no early cash flow to Google, since Google would not receive the proceeds of the exercise of the ESOs until two years later if at all. So the only entity that may have fared well are the four bidding bankers. But the fact that Google was interested in having their employees to better manage their holdings of employee stock options by capturing the "time value" suggests that "time value" and the forfeiture thereof are in the consciousness of the holders of employee stock options and perhaps their advisers.

Turning in another direction, in a paper entitled "*Employee stock options and investment*" by Babenko et al. (2011), there is a discussion about how much capital is raised by companies through the exercise of employee stock options. It says: "Firms increasingly issue equity indirectly by granting stock options to their employees.... Moreover, for many firms, the proceeds (and associated tax benefits)

from options exercises have grown to become one of the largest items on the cash flow statement" (p. 981).

In another paper entitled "*Analyzing the tax benefits from employee stock options*," Babenko and Tserlukevich (2009) state: "Although tax benefits are unlikely to be the main motive for stock option grants, we do find that companies with greater potential tax benefits grant more stock options" (p. 1799). They also say further: "Our estimates for the year 2005 indicate that nonexecutives hold 89% of all outstanding options and tax deductions from stock options averaged 14.9% of earnings before interest and tax (EBITs) for S&P 500 firms and 77.9% for NASDAQ 100 firms" (p. 1797). They continued: "Our results indicate that stock option deductions reduced tax by $59.1 million per year for the average firm in the S&P 500 and NASDAQ 100" (p. 1819).

Apparently, some companies and their executives have become conscious of the penalties to the employees of early exercises and the benefits of early exercises to the companies in the form of tax deductions, cash flow, and reduced liability towards the optionees.

With the above in mind, we introduce a different type of ESO, which in our opinion is more effective in accomplishing the company objectives of ESO grants while at the same time allowing more flexibility for the holders of ESOs to decrease risk, add value, and reduce taxes. We call this different type of ESO, Dynamic Employee Stock Options (DESOs). Our motivation of this research is to propose DESOs as an alternative to TESOs, and carry out a cost-benefit analysis to show the advantages of DESOs over TESOs.

3. Dynamic Employee Stock Options

Dynamic employee stock options are employee stock options whereby the optionee has various additional choices as to how to settle the exercise of her options. For example, those choices could be:

- Settle the traditional way where she receives 100% of the stock only, or
- Settle in a manner whereby she recovers the "time value" that she would otherwise forfeit from early exercises. She then accepts less than 100% stock (perhaps 75% or 80%) and more ESOs according to a formula which has more positive benefits for the optionee and the employer, or
- Settle in a manner which allows her to recover the otherwise forfeited "time value" by accepting less than 100% stock (perhaps 75% or 80%) and receiving extra restricted stock in addition to the ESOs "time value" recovered.

In order to illustrate the advantages of the Dynamic Employee Stock Options (DESOs) over the Traditional Employee Stock Options (TESOs), we first set out the advantages and disadvantages of the TESOs to the optionee and to the share holders. Table 1 is a list of advantages (A) and disadvantages (D) of traditional employee stock options.

Table 1. Advantages and disadvantages of traditional employee stock options

To the optionee	To the employer
1 No tax to the optionee at grant (A) 2 No cash received at grant (D) 3 Tax liability upon exercise (generally) (D) 4 Optionee receives more "fair value" in ESOs than cash at grant (A) 5 Early exercise causes forfeiture of time value and an early tax (D) 6 Delayed exercises avoid forfeiture and an early tax (A)	1 No tax deduction at grant, even though a value is transferred (D) 2 No cash paid out at grant (A) 3 Cash flow from tax credit upon exercise by optionee (A) 4 Fair value calculation at grant for expense purpose (A) 5 Receives forfeited time value, receive cash flow from exercises, receive cash from tax credit (A) 6 Deprives company of early flows and maintains liabilities to optionee (D)

There are penalties of early exercises, and conflict between the employer and employee. We illustrate this below.

3.1. Penalties of Early Exercise

The "time premium" is quite large if the stock is not far from the exercise price and there is substantial time to expiration. There is a large amount of "time premium" in the options even when there are 4.5 expected years to expiration and the stock has doubled. There is even a reasonable amount of remaining "time premium" when the stock has tripled and the ESOs have 2.5 years expected time remaining. And a substantial amount of tax is paid on the early exercise and early receipt of the money. Both the forfeiture of the time premium and the payment of the early tax are substantial penalties of early exercise. So there are significant reasons for the optionee to avoid the penalties of premature exercise of the traditional ESOs.

3.2. Conflict between the Companies and Grantees

So the companies obviously want the early exercises and there becomes a conflict as to what is best for the company and what is best for the holder of ESOs. If the stock has advanced substantially, the risk-averse executive looks for ways to reduce risk. Given that the traditional options allow only one choice (i.e., to make early exercises), the only efficient course that is available is to hedge the position with exchange traded calls and puts in order to avoid a premature exercise with the penalties of forfeiture of "time premium" and an early tax. But hedging is discouraged by the company (even to the extent of making optionees think they are prohibited from hedging when they are permitted to hedge). And there are

transaction costs to the optionee associated with hedging which may be incidental, especially if done by non-professionals.

As shown above, companies benefit from and want early exercises with the resulting flows to the company in the form of tax credits and sales of stock at the exercise price. Hedging the ESOs delays those flows. Hedging also delays the cash flow to the optionee compared with early exercises.

The following question arises: Is it possible for the company to achieve the flows of cash from the tax deduction and the optionee paying the exercise price while the optionee does not forfeit the "time value"? The answer is yes. That can be done by making the "time value" that was forfeited to the company upon premature exercises returnable to the optionee in the form of new ESOs when she exercises.

Since recovering the forfeited "time premium" is a benefit, the optionee should be willing to accept a concession in the form of additional ESOs in payment of part of the intrinsic value (perhaps 25%) of the stock when she exercises. If she exercises and accepts just 75% of the stock and 25% in new options and also receives back the "time premium" that she would have otherwise forfeited, both the optionee and the company would be better off, as indicated in the DESOs-related benefits stated below.

3.3. DESOs Benefits to the Optionee

The DESOs benefits to the optionee include the following:

- The optionee receives immediate cash upon exercise and sale equal to 75% of the intrinsic value. She also receives ESOs equal to the remaining 25% value of the intrinsic value.
- She avoids forfeiture by premature exercise of the "time value."
- She avoids payment of an early tax on 25% of the options' intrinsic value.
- After she exercises and sells, she will hold sufficient ESOs to re-create an alignment with the shareholders compared with the traditional exercise and sale of 100% of stock with no subsequent ESOs.
- She has far less risk after exercise than before the exercise and sale of stock.
- She has little need of hedging to reduce risk.
- The optionee is more likely to understand the value of the options grants since she will understand the value of the "time premium" and the "intrinsic value." Thus the grantee's interest would be more aligned with the shareholders.

It can be seen in the sample example in Figures 1 and 2 that if the optionee chooses the traditional exercise (which is one of her available choices), she would

receive $12,000 after tax if the stock is trading at $40 with no additional ESOs. One of the new choices in this DESOs invention allows the optionee to receive the following upon exercise with the stock at $40:

- 75% of the ESOs' intrinsic value before tax = $15,000 ($9000 after tax) plus
- 25% of the ESOs' intrinsic value before tax = $5,000 of new ESOs plus
- New ESOs from the "time premium" forfeited and returned = $4,526 of ESOs

We analyze DESOs with more details illustrated in Tables 2, 3, and 4. Table 2 illustrates cash-inflow to company, new ESOs to optionee, and the theoretical value of DESO based on different scenarios of stock prices at the time of exercise. Table 3 illustrates change of risks when exercising DESOs, where Delta and Gamma are known as Greeks to measure the sensitivity of option price against quantifiable factors. Table 4 compares the alignment of interests between employee and employer upon exercise and sale of stocks received with DESOs and TESOs, which concludes that there is a substantial difference of alignments between DESOs and TESOs and thus DESOs are superior to TESOs.

Table 2. Analysis of the results of exercising 1000 DESOs

Price of stock	Cash received by optionee (before tax)	New ESOs received	Theoretical value of 2+3 (at exercise)
30	$7,500	687	$16,000
40	$15,000	583	$24,200
50	$22,500	533	$33,293
60	$30,000	505	$42,370
Note: Column 4 totals approximately equal to the theoretical values in Figure 1.			

Table 3. Analysis of change of risks of exercising 1000 DESOs

Price of stock	New ESOs received	Delta Decrease	Gamma Change
30	687	-421	+20
40	583	-571	+27
50	533	-661	+31
60	505	-675	+32

Table 4. Comparison of alignment of interests between employee and employer upon exercise and sale of stocks received with DESOs and TESOs

Price of stock	New ESOs received	Delta Decrease	Remaining Delta
30	687	-421	+450
40	583	-571	+360
50	533	-661	+330
60	505	-675	+320

It is obvious that a substantial alignment exists after exercise and sale with the DESOs and none with the exercise and sale of TESOs.

3.4. DESOs Benefits to the Employer

The DESOs benefits to the employer include the following:

- Since the optionees will probably exercise sooner than with the traditional ESOs (because the penalties upon early exercises are far less), cash flows from tax credits and tax deduction of 75% of the intrinsic value will come sooner as will the cash flow from the exercise and purchase of stock by the optionees from the company.
- The executive is incentivized to take upon new risky projects sooner since he now holds ESOs that are at-the-money with reduced overall delta risk.
- The company (and the executives) will worry less about the critics of hedging, because DESOs reduces the need for hedging.
- The company will be considered to have the best equity compensation plan and can more easily attract the best talent.
- It also reduces the gaming of the exiting and granting of the options by executives.
- Costs to the company may be less than if hedging is performed to preserve "time value" and delay taxes, when everything is considered.

Following is a list of the most recognizable executives that exercised their ESOs very close to when the ESOs were expiring:

- Steve Jobs of Apple exercised 120,000 on 8/12/2007, ESOs expiring on 8/13/2007
- Ron Johnson of Apple exercised 200,000 on 12/1/2009, ESOs expiring on 12/14/2009
- Paul Otellini of Intel exercised 800,000 on 11/9/2007, ESOs expiring on 11/12/2007
- Larry Ellison of Oracle exercised 10,000,000 on 4/3/2009, ESOs expiring on 6/4/2009

- John Chambers of CISCO exercised 2,000,000 on 2/8/2010, ESOs expiring on 5/14/2010
- John Chambers of CISCO exercised 1,350,000 on 2/13/2007, ESOs expiring on 5/1/2007
- James Dimon of JP Morgan exercised 3,478,000 on 2/3/2010, ESOs expiring on 3/17/2010
- James Dimon of JP Morgan exercised 1,261,000 on 7/17/2009, ESOs expiring on 8/15/2009

The amount of time premium forfeited and the penalty for early exercises in the above cases were near zero, making the actual cost to the shareholders the same for the TESOs as for DESOs.

Other executives did not wait to near expiration. For example, Mr. Keitel, CFO of Qualcomm (QCOM), exercised ESOs on 12/20/2010 to purchase 475,000 at $44.02, expiring on 11/3/2015. The stock was trading at $49.75. The exercise was 4 years and 10 months prior to expiration. He sold the stock pursuant to a SEC Rule 10b-5-1 plan. The "time value" forfeited was $3,980,500 and the penalty of the early tax payment was $206,000. Under the proposed DESOs, he would have recovered the forfeited "time value" by receiving an additional amount of ESOs with the strike price of $49.75 with 10 years to expiration, whose value equaled $3,980,500. He would also receive a 75/25 stock to new ESOs split.

On 2/8/2011, Kreins Scott, chairman of the board Juniper Networks (JNPR), exercised 750,000 ESOs which were set to expire on 1/29/2014. He sold the stock at an average price of $40.30. He forfeited $4.43 on 750,000 ESOs or $3,322,500 in "time value" and about $140,000 in early tax penalties. Under the proposed DESOs, he would have recovered the forfeited "time value" by receiving an additional amount of ESOs with the strike price of $40.30 and with 10 years to expiration, whose value equaled $3,322,500. He would also receive a 75/25 stock to new ESOs split.

4. Valuation of DESOs

We employ both the binomial lattice model and the Black-Scholes model to value DESOs and TESOs. Before we illustrate the methodology in detail, we would like to show you our findings: While the DESOs bring great benefits to both employees and the company, surprisingly, the cost to the company is only 4% more than TESOs.

We use an example with the inputs as shown in Figure 3. We start with building a binomial lattice of stock prices proposed by Cox et al. (1979), as shown in Figure 4. We value the TESOs at $13.66 per share, as shown in Figure 5, using rules at each node on Figure 6. We value the DESOs at $14.14 per share, as shown in Figure 7, using rules as shown in Figure 8.

Grant Date Stock Price	$ 30.00	
Grant Date Strike Price	$ 30.00	
Contractual Maturity	10	years
Risk-Free Interest Rate	5%	
Volatility	30%	
Vesting Period	3	years
Exercise Multiple	2	
Employee Exit Rate	0%	

Figure 3. General inputs for ESOs

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										$ 602.57
									$ 446.39	
								$ 330.70		$ 330.70
							$ 244.99		$ 244.99	
						$ 181.49		$ 181.49		$ 181.49
					$ 134.45		$ 134.45		$ 134.45	
				$ 99.60		$ 99.60		$ 99.60		$ 99.60
			$ 73.79		$ 73.79		$ 73.79		$ 73.79	
		$ 54.66		$ 54.66		$ 54.66		$ 54.66		$ 54.66
	$ 40.50		$ 40.50		$ 40.50		$ 40.50		$ 40.50	
$ 30.00		$ 30.00		$ 30.00		$ 30.00		$ 30.00		$ 30.00
	$ 22.22		$ 22.22		$ 22.22		$ 22.22		$ 22.22	
		$ 16.46		$ 16.46		$ 16.46		$ 16.46		$ 16.46
			$ 12.20		$ 12.20		$ 12.20		$ 12.20	
				$ 9.04		$ 9.04		$ 9.04		$ 9.04
					$ 6.69		$ 6.69		$ 6.69	
						$ 4.96		$ 4.96		$ 4.96
							$ 3.67		$ 3.67	
								$ 2.72		$ 2.72
									$ 2.02	
										$ 1.49

Figure 4. Stock price tree

										$572.57
									$416.39	
								$300.70		$300.70
							$214.99		$214.99	
						$151.49		$151.49		$151.49
					$104.45		$104.45		$104.45	
				$ 69.60		$ 69.60		$ 69.60		$ 69.60
			$ 43.79		$ 43.79		$ 43.79		$ 43.79	
		$ 30.33		$ 29.63		$ 28.56		$ 26.81		$ 24.66
	$ 20.56		$ 19.52		$ 18.01		$ 15.70		$ 11.96	
$ 13.66		$ 12.55		$ 11.05		$ 8.93		$ 5.80		$ -
	$ 7.90		$ 6.62		$ 4.96		$ 2.81		$ -	
		$ 3.89		$ 2.72		$ 1.36		$ -		$ -
			$ 1.47		$ 0.66		$ -		$ -	
				$ 0.32		$ -		$ -		$ -
					$ -		$ -		$ -	
						$ -		$ -		$ -
							$ -		$ -	
								$ -		$ -
									$ -	
										$ -

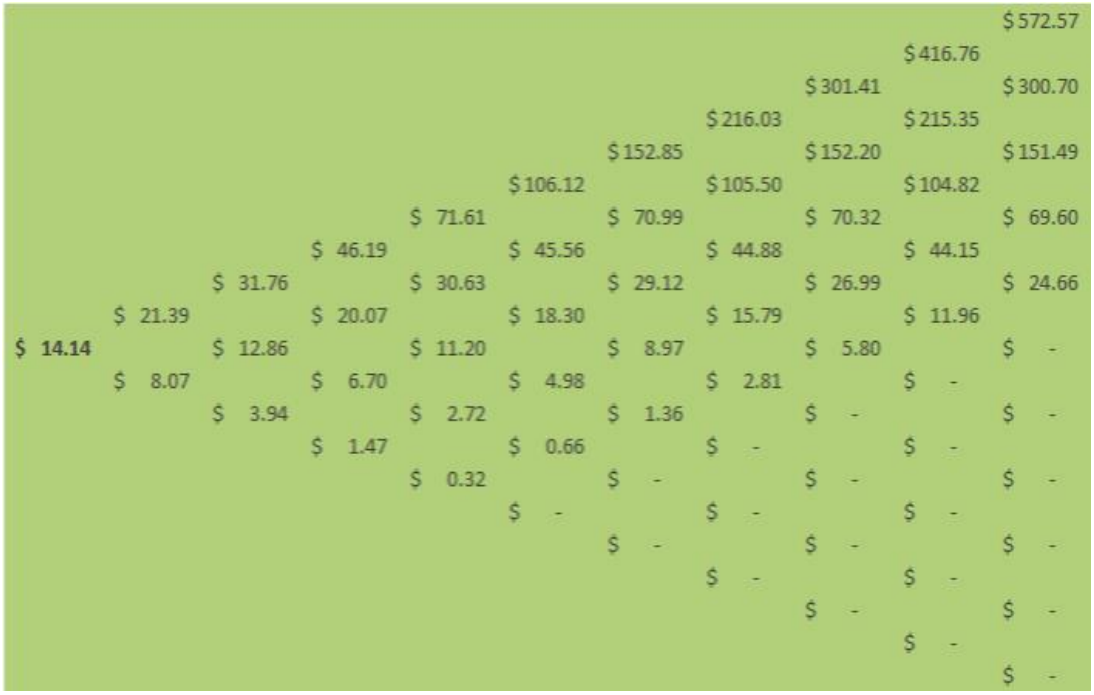
Figure 5. Valuation of TESOs using binomial tree model

Rules on each node (i, j):
if t<v, then f(i,j)=(1-e)*exp(-r)*(p* f(i+1, j+1)+(1-p)*f(i+1, j))
if t>=v and s(i,j) >=K*m, then f(i, j)=s(i,j)-K
if t>=v and s(i,j)<K*m, then f(i,j)=(1-e)*exp(-r)*(p*f(i+1,j+1)+(1-p)*f(i+1,j))+e*max(s(i,j)-K,0)

option price = f(0,0).

Where f(i,j) is option price at node (i,j), t is time period, v is vesting period in years, e is exit rate, K is exercise price (or strike price), r is risk-free interest rate, and p is the probability that stock price goes up.

Figure 6. Rules on each node of the stock price tree for determining the value of TESOs



													$572.57
												$416.76	
											$301.41		$300.70
										$216.03		$215.35	
									$152.85		$152.20		$151.49
								$106.12		$105.50		$104.82	
							$71.61		$70.99		$70.32		$69.60
						$46.19		$45.56		$44.88		$44.15	
					$31.76		$30.63		$29.12		$26.99		$24.66
				$21.39		$20.07		$18.30		$15.79		$11.96	
	$14.14		$12.86		$11.20		$8.97		$5.80		$-		$-
		$8.07		$6.70		$4.98		$2.81		$-		$-	
			$3.94		$2.72		$1.36		$-		$-		$-
				$1.47		$0.66		$-		$-		$-	
					$0.32		$-		$-		$-		$-
						$-		$-		$-		$-	
							$-		$-		$-		$-
								$-		$-		$-	
									$-		$-		$-
												$-	
													$-

Figure 7. Valuation of DESOs using binomial tree and Black-Scholes

Rules on each node (i, j): if exercised, 75% stocks and 25% new options including time premium
New options percentage=25% (this value can be changed)

if t<v, then f(i,j)=(1-e)*exp(-r)*(p* f(i+1, j+1)+(1-p)*f(i+1, j))
if t>=v and s(i,j) >=K*m, then f(i,j) = s(i,j)-K+25%*C(s(i,j),K,r,sigma,T)-(s(i,j)-K))
if t>=v and s(i,j)<K*m, then f(i,j)=(1-e)*exp(-r)*(p*f(i+1,j+1)+(1-p)*f(i+1,j))+e*max(s(i,j)-K,0)

option price = f(0,0).

Where f(i,j) is option price at node (i,j), t is time period, v is vesting period in years, e is exit rate, K is exercise price (or strike price), r is risk-free interest rate, p is the probability that stock price goes up, sigma is stock volatility, T is option maturity, and C is the Black-Scholes formula for calculating theoretical option price.

Figure 8. Rules at each node of the stock price tree for determining the valuation of DESOs

As shown above, we value the DESOs at $14.14 per share and the TESOs at $13.66 per share. The difference = $14.14 - $13.66 = $0.48 Or The DESOs cost the company $0.48/$13.66 = 3.52% more. It is clearly that the benefits outweigh the costs; therefore, it is a no-brainer for companies to implement DESOs.

5. Conclusion

The dynamic employee stock options (DESOs) benefit the company and the optionee. And the additional costs to the company are small compared to significant benefits to optionee and the company. According to the financial accounting standards (FAS 123R or ASC 718) to treat accounting of ESOs, the cost of ESOs must be expensed. We argue that the extra cost derived here is just accounting cost. At the time a company issues DESOs to a grantee who decides to exercise his/her options, there is no extra cost to the company since uncertainty is eliminated. If companies truly want to stop hedging and allow efficient management of the grants by the optionees, implementing DESOs is ideal and encouraged.

References

Aboody, D., Johnson, N. B., & Kasznik, R. (2010). Employee stock options and future firm performance: Evidence from option repricings. *Journal of Accounting and Economics, 50*(1), 74-92.

Armstrong, C. S., & Vashishtha, R. (2012). Executive stock options, differential risk-taking incentives and firm value. *Journal of Financial Economics, 104*(1), 70-88.

Babenko, I., Lemmon, M., & Tserlukevich, Y. (2011). Employee stock options and investment. *Journal of Finance, 66*(3), 981-1009.

Babenko, I., & Tserlukevich, Y. (2009). Analyzing the tax benefits from employee stock options. *Journal of Finance, 64*(4), 1797-1825.

Brown, A. (2006, December 12). About transferable stock options. http://googleblog.blogspot.com/2006/12/about-transferable-stock-options.html

Carpenter, J. N., Stanton, R., & Wallace, N. (2010). Optimal exercise of executive stock options and implications for firm cost. *Journal of Financial Economics, 98*(2), 315-337.

Cox, J. C., Ross, S. A., & Rubinstein, M. (1979). Option pricing: A simplified approach. *Journal of Financial Economics, 7*(3), 229-263.

Cvitanić, J., Wiener, Z., & Zapatero, F. (2008). Analytic pricing of employee stock options. *The Review of Financial Studies, 21*(2), 683-724.

Hand, J. R. M. (2008). Give everyone a prize? Employee stock options in private venture-backed firms. *Journal of Business Venturing, 23*(4), 385-404.

Hayes, R. M., Lemmon, M., & Qiu, M. (2012). Stock options and managerial incentives for risk taking: Evidence for FAS 123R. *Journal of Financial Economics, 105*(1), 174-190.

Hull, J., & White, A. (2004). How to value employee stock options. *Financial Analyst Journal, 60*(1), 114-119.

León, A., & Vaello-Sebastià, A. (2009). American GARCH employee stock option valuation. *Journal of Banking & Finance, 33*(6), 1129-1143.

Leung, T., & Sircar, R. (2009). Accounting for risk aversion, vesting, job termination risk and multiple exercises in valuation of employee stock options. *Mathematical Finance, 19*(1), 99-128.

Olagues, J., & Summa, J. F. (2010). *Getting started in employee stock options*. New York, NY: John Wiley & Sons.

Palmon, O., Bar-Yosef, S., Chen, R.-R., & Venezia, I. (2008). Optimal strike prices of stock options for effort-averse executives. *Journal of Banking & Finance, 32*(2), 229-239.

Sellers, K., Huang, Y., & King, B. A. (2008). Are your ESO values on target? Valuing employee stock options for closely held companies. *Journal of Accountancy, 205*(3), 44-47.