CASE STUDY: RISK-BASED EXECUTIVE COMPENSATION VALUATION

This case was written by Patrick Haggerty, a principal at the executive compensation consulting firm James F. Reda & Associates, LLC. As independent advisors to management and boards, the firm assists companies with designing and implementing executive compensation programs. The firm has significant expertise in valuing long-term incentive awards using guidance provided by FASB Statement No. 123 (Revised 2004), Share-Based Payment (FAS 123(R)), and related interpretations. Through partnering with Dr. Mun and using his option valuation software packages, James F. Reda & Associates, LLC, helps clients determine and understand the compensation expense impact of selecting alternative long-term incentive designs.

This case is based on actual projects performed, but for the purposes of maintaining proprietary information, we use a fictitious entity named Boris Manufacturing, Inc. (Boris). This case study is about the process that Boris used to evaluate alternative long-term incentive (LTI) plan designs and determine the fair value for expensing purposes, as required by the new financial accounting standards. Through the following steps, the management team and the compensation committee worked together to evaluate the advantages and disadvantages of the various LTI vehicles available. The steps undertaken included:

- Reviewing the historical LTI awards made to employees.
- Reviewing the company's LTI plan.
- Conducting a market study.
- Evaluating advantages and disadvantages of each LTI vehicle available.

Ultimately, Boris decided to award restricted stocks that vest on achieving a total shareholder return target. Because the performance condition is total shareholder return, an option-pricing model can be used to determine fair value based on a barrier option, where the stock vests only after breaching a predetermined upper performance barrier. A simple Black–Scholes is not designed to value these types of awards. Instead, Monte Carlo and binomial lattice models like Dr. Mun's Real Options Super Lattice Solver and Risk Simulator software are most appropriate because they include the necessary input factors. FAS 123(R) considers the vesting criteria on Boris's restricted stock award a "market condition," meaning it is stock-price related. This distinction is important because if Boris designed a plan that vests on achieving a non-stock price-related measure (i.e., earnings per share, or EPS, and earnings before interest, taxes, depreciation, and amortization, or EBITDA), the company could not factor the performance condition

into the fair value of the award (FAS 123(R) calls this type of performance measure a "performance condition"). For more technical details on valuing regular employee stock options based on the 2004 revised FAS 123, see Dr. Johnathan Mun's case study in Chapter 14 on valuing employee stock options.

Background

Boris Manufacturing Inc. is a publicly traded billion-dollar manufacturer of chemical products. The company has 2,000 employees with approximately 200 management- and executive-level employees. The compensation committee at Boris is responsible for determining executive pay levels and awarding LTIs to all employees. The compensation committee evaluated pay practices among its peer group companies and determined that LTIs should be a significant and important part of total compensation. Accordingly, the company has awarded its management- and executive-level employees LTIs. Historically, Boris awarded stock options to employees because prior to FAS 123(R) the expense was zero—under previous accounting rules, compensation expense was zero for at-the-money stock options if the number of shares awarded are known on the grant date.

Boris's stock option awards have not provided the incentive or link to shareholders that the compensation committee expected. Over the past 4 years, Boris's stock price has been relatively volatile and has generally decreased. Roughly half of the stock options Boris awarded to employees have an exercise price higher than the current stock price or being *underwater*. Further, the company kept awarding more stock options because the stock price continued to fall. As a result, the company has unproductive stock overhang, employees with minimal linkage to shareholders, and few shares remaining in their stock pool. As described next, the compensation committee decided to undertake a study to evaluate these issues.

Compensation Committee Process

To review alternative LTI designs, the compensation committee conducted the following steps:

1. Reviewed historical LTI awards made to employees.

   Purpose: To understand what employees had received in the past such as type of award, current fair value of award, and any gains received.

   Result: Over the past 3 years, Boris awarded approximately 900,000 stock options to employees each year (2.7 million in total). Unfortunately, roughly half are underwater, and very few employees were able to exercise and sell with any gain.

2. Reviewed company's long-term incentive plan.

   Purpose: To understand types of LTI vehicles that Boris shareholders approved in its LTI plan and how many shares are available for awards.

   Result: Boris's LTI plan is very flexible and allows for all types of LTI vehicles, including:

   - Nonqualified stock options (NQSO).
   - Incentive stock options (ISO).
   - Stock-settled stock appreciations rights (Stock SAR).
   - Restricted stock and restricted stock units (RSU).
   - Performance shares and performance units.

   Due to higher than expected stock option grants made over the past 3 years, the company has only 500,000 shares available for future grants. It is likely that Boris will need to go back to shareholders next year, so they want to use the remaining shares wisely.

3. Conducted a market study.

   Purpose: To determine competitive practices for LTI awards, costs, and LTI designs (vesting, performance measures, termination provisions, and holding periods).

   Result: Based on an analysis of industry competitors, the company determined that historical stock option awards were above market levels—on an individual position level, overhang basis, and cost basis. Also, it was determined that many peer group companies are awarding full value shares (i.e., restricted stock and performance shares) rather than stock options. Among the peer group companies that are awarding full value shares with performance conditions, the most common performance conditions were total shareholder return, earnings per share, and EBITDA.

4. Evaluated advantages and disadvantages of each LTI vehicle available. Table 7.17 summarizes the compensation committee's findings.

Compensation Committee Decision

The compensation committee decided to award restricted stock that vests on achieving a predefined total shareholder return (TSR) target. Key factors that influenced the committee to select this LTI plan included:

- Reduction in overhang and run rate.
- Better link to shareholders.
- Requires minimum acceptable level of performance before payout.
- Promotes stock ownership because executives do not have to sell shares to exercise.

TABLE 7.17 Advantages and Disadvantages of LTI Vehicles

LTI Vehicle	FAS 123R Measurement Approach	Key Employee Tax Issue	Key Advantage	Key Disadvantage
NQSOs	Fixed: grant date fair value[a]	Ordinary income tax at exercise	Determine taxable event, upside potential	Potential underwater, highly dilutive
ISOs	Fixed: grand date fair value	Capital gains tax at sale[b]	Capital gains, upside potential	No company tax deduction, ISO rules
Stock SARs	Fixed: grant date fair value	Ordinary income tax at exercise	Limits dilution, upside potential	Potential underwater
Restricted Stock	Fixed: grant date face value[c]	Ordinary income when vested	Retention, no cost to employee	Pay tax when vested, not 162(m) qualified
Restricted Stock Units (paid in stock)	Fixed: grant date face value	Ordinary income when delivered	Flexibility, can include performance	Flexibility subject to 409A rules
Performance Shares	Fixed/variable: stock price fixed, shares adjusted[d]	Ordinary income when vested	Additional shares and higher stock price	Setting performance measures
Performance Units (paid in cash)	Variable:[e] adjusted until paid	Ordinary income when vested	Receive cash, diversify	Cash flow, variable accounting

[a]Fair value based on an option-pricing model, such as Black–Scholes.

[b]If requisite holding periods are met, otherwise same as NQSOs.

[c]Face value equals stock price on grant date.

[d]Stock price fixed on grant date; shares are variable until measurement period is complete.

[e]Mark-to-market accounting until award is paid.

Details of the design include:

Type	Restricted stock
Vesting criteria	Vests on achieving 6 percent annual TSR
Performance period	3 years (average cumulative TSR must exceed 6 percent)
Dividend rights	Participants do not receive dividends until stock has vested
Number of shares	All-or-nothing award, no adjustment in number of shares if TSR is below or above 6 percent

Before selecting the 6 percent TSR target, the compensation committee reviewed Boris's historical TSR. Based on this review, it was determined that Boris's 3-year historical average annualized return is 5.2 percent, and using this and the volatility estimates, we were able to compute the expected distribution of future returns (see Figure 7.31). The committee considered this and set the TSR target and expected range TSR performance at:

TSR Target:	6%
Minimum Expected:	0%
Most Likely:	5%
Max Expected:	9%

The compensation committee considered and analyzed but ultimately decided against the following alternative plan designs. Each one of these alternatives would result in a different fair value calculation.

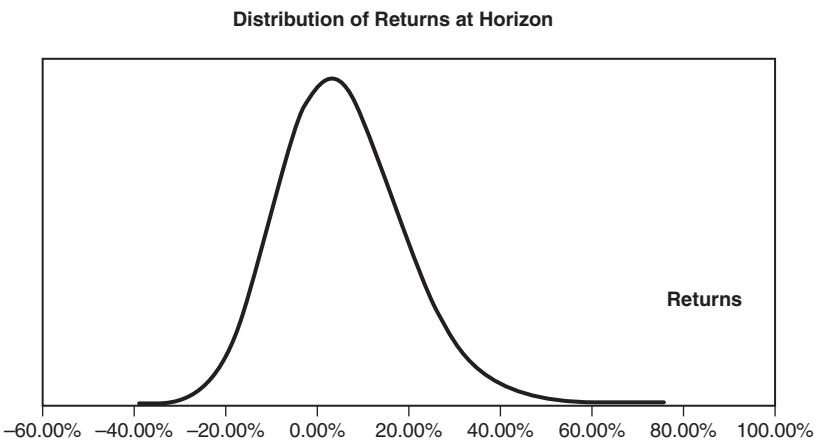


FIGURE 7.31 Boris's projected returns based on historical performance.

- Increasing duration of performance period from 3 years to 5 years.
- Vesting award based on company TSR performance against a peer group rather than a predetermined target.
- Awarding performance shares rather than restricted stock (Note: this change does not impact the fair value but impacts the number of shares that will vest).

Compensation Cost Determination

Using FAS 123(R) guidance, Boris determined the fair value of the restricted stock award for expense recognition. Compensation cost for the award will equal the fair value multiplied by the number of restricted shares granted. Determining the fair value for its restricted stock awards is similar to the process Boris had used to determine fair value of its stock option awards under the pro forma disclosure rules of FAS 123. However, a simple Black–Scholes model cannot be used to determine the fair value of an award with a TSR target. Instead, a Monte Carlo simulation model coupled with a binomial lattice model must be used with inputs as detailed next (see Chapters 12 and 13 for details on option valuation techniques). A Monte Carlo simulation model coupled with a binomial model is more appropriate than other closed-form option-pricing models because this analysis has a barrier associated with the payoff structure (i.e., TSR targets), which means only a binomial lattice can be used to model such barrier options. In addition, the potential that Boris's TSR will exceed these targets is highly uncertain and thus we need to run a Monte Carlo simulation to capture its expected value. Therefore, we couple Risk Simulator's Monte Carlo simulation capabilities with the Employee Stock Options Valuation and Real Options SLS software to perform the computations. See the chapters on real options analysis for more details on running the SLS software, or refer to the author's *Real Options Analysis, Second Edition* (Wiley Finance, 2005). The following are the assumptions used in the model:

- Grant date. This assumption determines the grant date stock price and interest rate assumption.
- Grant date stock price. Equals the closing stock price on the grant date, or $20.00 for this example.
- Purchase price. Typically $0 for restricted stock awards.
- Volatility. Calculated based on historical stock prices, 30 percent for this example. Significant guidance for determining this assumption is provided in FAS 123(R) and SEC's Staff Accounting Bulletin No. 107.
- Contractual period. Equals duration of performance period, 3 years for this example.
- Dividend yield. Calculated based on Boris's historical dividend yield, 1 percent for this example.

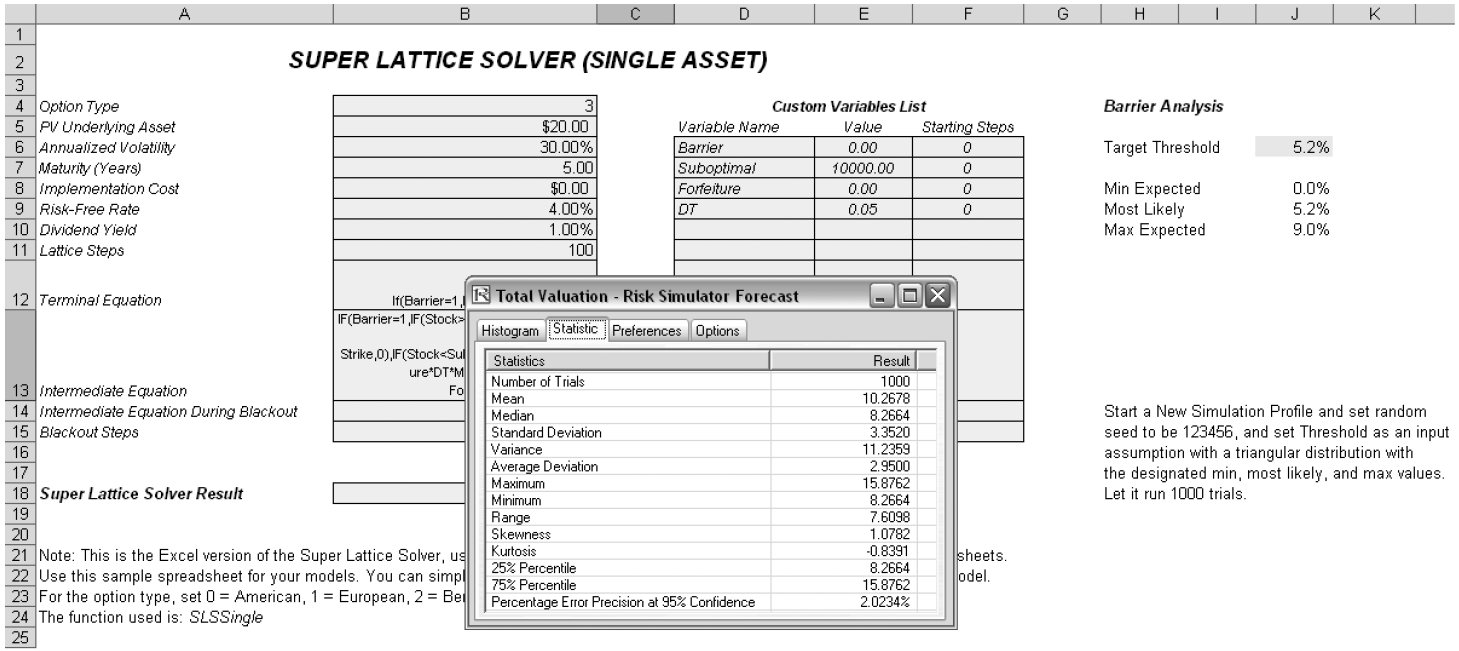
Dividend Payment Date	Dividend Amount	Stock Price ($)	Quarterly Dividend Yield (%)
3/15/2005	$0.04	15.00	0.27
6/15/2005	$0.04	15.50	0.26
9/15/2005	$0.04	15.75	0.25
12/15/2005	$0.04	16.00	0.25
Sum of quarterly dividend yields			1.03

- Interest rate. Based on the U.S. Treasury rates available on the grant date with a maturity equaling the contractual term. For this example, we used a 4 percent interest rate.
- TSR target. Boris's compensation committee set the target at 6 percent based on the company's 3-year historical average annualized return of 5.2 percent.
- Expected range TSR performance. Sets the parameters for determining the likelihood of achieving the TSR target. The committee thought it would be reasonable to assume a minimum expected TSR of 0 percent and a stretch TSR of 9 percent.
- Suboptimal exercise multiple. Set the price at which the participant is expected to exercise. This assumption is set at 10,000, which theoretically renders it unattainable. If this award were a stock option, this assumption could be used if employee exercise behavior indicated a lower level.

The results generated using Risk Simulator's Monte Carlo simulation coupled with the Real Options SLS provides a fair value of $10.27 (Figure 7.32). Real Options SLS software was used to obtain the restricted stock's fair-market valuation while Risk Simulator was used to simulate the potential TSR values. Thus, if Boris awards 400,000 restricted shares to employees, the compensation cost equals 400,000 × $10.27 = $4,108,000, which is accrued over the performance period of 3 years. If the Monte Carlo simulation model were not used, Boris would be required to use the grant date stock price, $20, resulting in an expense of 400,000 × $20 = $8,000,000. Therefore, by applying the right methodologies as well as the right engineered LTI grants, Boris was able to reduce its expenses by almost 50 percent.

Conclusion

Monte Carlo Simulation models can be used to help design the LTI award by understanding the impact that certain changes have on fair value, and to determine the fair value of the LTI award for expense purposes under FAS 123R. Without the use of such sophisticated methodologies, the fair value



SUPER LATTICE SOLVER (SINGLE ASSET)

Option Type	3
PV Underlying Asset	$20.00
Annualized Volatility	30.00%
Maturity (Years)	5.00
Implementation Cost	$0.00
Risk-Free Rate	4.00%
Dividend Yield	1.00%
Lattice Steps	100
Terminal Equation	If(Barrier=1,IF(Stock>Strike,0),IF(Stock<Strike,0),IF(Stock<Sure*DT*M
Intermediate Equation	Fo
Intermediate Equation During Blackout	
Blackout Steps	
Super Lattice Solver Result	

Note: This is the Excel version of the Super Lattice Solver, us sheets.
Use this sample spreadsheet for your models. You can simpl odel.
For the option type, set 0 = American, 1 = European, 2 = Be
The function used is: *SLSSingle*

Custom Variables List

Variable Name	Value	Starting Steps
Barrier	0.00	0
Suboptimal	10000.00	0
Forfeiture	0.00	0
DT	0.05	0

Barrier Analysis

Target Threshold	5.2%
Min Expected	0.0%
Most Likely	5.2%
Max Expected	9.0%

Start a New Simulation Profile and set random seed to be 123456, and set Threshold as an input assumption with a triangular distribution with the designated min, most likely, and max values. Let it run 1000 trials.

Total Valuation - Risk Simulator Forecast

Histogram | Statistic | Preferences | Options

Statistics	Result
Number of Trials	1000
Mean	10.2678
Median	8.2664
Standard Deviation	3.3520
Variance	11.2359
Average Deviation	2.9500
Maximum	15.8762
Minimum	8.2664
Range	7.6098
Skewness	1.0782
Kurtosis	-0.8391
25% Percentile	8.2664
75% Percentile	15.8762
Percentage Error Precision at 95% Confidence	2.0234%

FIGURE 7.32 Total valuation results (sample only) for Boris's LTI.

would never have been computed correctly and the decision to undertake the right LTI would have been flawed. In addition, such methodologies outlined here can also be used for multiple other applications such as engineering LTIs and stock-based compensations that are tied to, say, a market index such as the S&P 500, or a company's performance (i.e., we can use financial metrics such as net profit margin, gross profits, EBITDA, and the like), or perhaps to some commodity price (e.g., price of gold or oil). For technical and application details on FAS 123R and running the Employee Stock Options Valuation software, please refer to the author's book, *Valuing Employee Stock Options (Under 2004 FAS 123)* (Wiley Finance, 2004).