

Option Expensing – Creating an Accurate, Optimal and Auditable Expense

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Background

- Most companies have not adopted FAS 123 – “Accounting of Stock Based Compensation” as of the date of this presentation
- IFRS2 now effective
- Companies must expense ESOs beginning for financial reporting periods starting after June 15, 2005 (FAS) or January 1 2005 (IFRS)
- Statements require that financial statements for public companies realize the impact of stock-based compensation according to “fair value”
 - Means valuations of employee stock options (ESOs) must be performed for current and future grants
 - Shareholders and external parties will be scrutinizing how companies perform these valuations

Option Pricing Models

Black-Scholes Model

- Simple to use; six factors input into formula

Lattice (binomial) model

- More complicated assumptions
- Assumptions can vary over contractual life
- Must be used for awards with market conditions (e.g., stock price vesting)

Accounting guidance does not express a preference for either model

- Change in model not a change in accounting principle but requires disclosure of reason for change

Stochastic models

- More complicated option designs

Option Pricing Model Assumptions

Option Models require, at a minimum, the following six variables:

- Stock price at grant date
- Option exercise price
- Expected option term / suboptimal exercise factor(s)
- Expected stock price volatility
- Expected dividend yield
- Risk-free interest rate

• Difficult to select a single "best estimate" of each assumption



• Key is process and audit trail

Binomial vs. Black-Scholes

Factors	Black-Scholes	Binomial (lattice)
Complexity of use	Less Difficult	More Difficult
Complexity of implementation	Less Difficult	More Difficult
Complexity of maintenance	Less Difficult	More Difficult
Flexibility in assumptions over option life	No	Yes
Flexibility in application	Less Flexibility	More Flexibility
Six (6) 'key' FAS 123R/ IFRS2 assumptions required	Yes	Yes / Maybe*
Additional assumptions allowed?	No	Yes
Market perception of accuracy	Medium - High	High
Financial statement disclosures	Moderate	Complex
Complexity of audit	Less Difficult	More Difficult



* Expected term is an output of many binomial fair value models.

Black-Scholes and the Traditional Binomial Model

Illustration comparing closed-form Black-Scholes model with a traditional binomial model (present value of future cash flows)

Black-Scholes

$$C = e^{-\delta t} SN(d_1) + Xe^{-rt} N(d_2)$$

$$d_1 = \frac{\ln(S/X) + \left(r - \delta + \frac{\sigma^2}{2}\right)t}{\sigma\sqrt{t}}$$

$$d_2 = d_1 - \sigma\sqrt{t}$$

Traditional Binomial Model

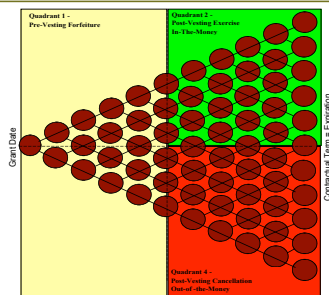


Inputs to the Binomial Model

- Similar to the Black-Scholes Option Pricing Model, option values derived with the Binomial Model are based on key assumptions
- Different than Black-Scholes, binomial inputs may be adjusted for each node
- Expected Term is an input assumption for Black-Scholes
- Sub-optimal exercise factors (i.e., stock price at exercise compared to the strike price) are generally inputs which result in an expected term output
 - When the gain relating to the sub-optimal exercise factor is reached, exercise occurs
 - The time elapsed between the occurrence of exercise and the grant date is considered the time-based expected term



Defining Events in a Binomial Model



Additional Features of the Binomial Model

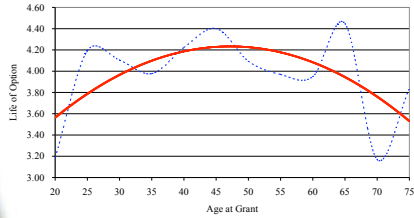
Because the Binomial Model assesses the value at each node, it can accommodate features specific to employee stock options:

- Vesting requirements
 - Exercises cannot occur if the option is unvested
 - Any value gains during these early nodes are not included in the present value calculation
- Early exercise behaviors
 - A sub-optimal exercise factor is an input of the model, instead of an expected term assumption
 - If the stock price reaches the sub-optimal exercise factor, i.e. 2X the stock price at grant, then the option is assumed to be exercised and the binomial tree stops at that node. The time elapsed between the grant date and the point of exercise is the resulting expected term value.
 - As the option is exercised at that point, any additional future gains are disregarded in the present value calculation



Early Exercise Behaviour – Examples

- 26 companies have provided data on over 1 billion historical option exercises that have been analyzed relative to employees' age-at-grant date
- Establishment of a "frown" curve

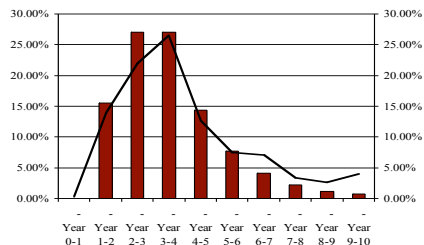


Key Assumptions – Expected Term

Companies may choose to analyze "other factors that may affect expectations about employees' exercise

- Common stratifications to be examined include:
 - Historical behavior (by year) of exercised, cancelled, and outstanding shares
 - Exercise behavior by option value increases (i.e., Sub-Optimal Exercise Factor Analysis)
 - Demographic behavior
 - Age at Grant
 - Tenure at Grant
 - Geographic Location
 - Pay Grade / Salary Level

Exercise Behaviour of a Financial Services Client



Key Assumptions – Volatility

- FAS 123R/ IFRS2 does not specify a method for estimating expected volatility but instead provides factors to be considered including:
 - the historical volatility that is generally commensurate with the expected option life,
 - implied volatilities,
 - the length of time a stock has been publicly traded,
 - regular intervals for price observations,
 - corporate and capital structure,
 - the possibility of mean reversion, and,
 - in some cases, the volatility of peer companies.
- In addition, the expected volatility assumption should be consistent from period to period, and the process of estimating it should:
 - understand all applicable factors available, and
 - include a procedure for evaluating and weighting information.

Real Life Example – Volatility



Key Assumptions – Volatility

- Prior to analyzing volatility, you review the stock price movement to determine if during any periods your stock price movement was particularly volatile
- In addition, you may graph major indices (DJIA, NASDAQ, S&P, and Russell 2000, FTSE, Sector Index, Peer group) to compare with your stock prices for a visual comparison of data
- You may disregard any period of unusual stock price movement if the event was unique and not expected to be repeated during the period commensurate with the expected term of the options to which this volatility would be applied
- Additionally you may compare historical volatility with that of the major indices as a second determining factor in rationalizing a modification to volatility calculations, if needed

Initial Peer Data – Expected Volatility

Peer Company	Years of Data	Mean Reversion	Median of		Implied Volatility	Implied Volatility		Prior Year FAS 153 Selection
			5.0 Year	1.5 Year		52 Week	52 Week	
Company 1	9.38	66.63%	100.64%	73.41%	66.82%	62.22%	115.30%	115.00%
Company 2	13.87	59.00%	60.40%	56.03%	62.49%	48.42%	103.87%	80.00%
Company 3	10.84	60.08%	71.90%	39.89%	60.30%	40.07%	200.07%	64.00%
Company 4	13.87	73.59%	65.06%	68.36%	N/A	53.03%	139.54%	83.00%
Company 5	11.95	54.01%	56.09%	42.46%	51.28%	35.68%	69.07%	60.00%
Company 6	13.87	56.36%	56.41%	33.84%	44.28%	26.77%	54.29%	70.00%
Company 7	13.87	42.69%	33.05%	53.12%	N/A	N/A	N/A	38.00%
Company 8	13.87	63.28%	58.23%	59.31%	68.61%	48.48%	98.03%	87.00%
Company 9	6.41	74.94%	78.08%	57.08%	N/A	N/A	N/A	93.00%
Company 10	13.42	35.25%	35.03%	27.18%	N/A	N/A	N/A	50.00%
Company 11	11.88	60.96%	81.78%	28.83%	N/A	N/A	N/A	71.84%
Average		60.37%	60.61%	48.92%	59.05%	43.78%	112.81%	75.67%
Median		59.00%	58.23%	53.12%	61.70%	48.42%	103.87%	80.00%
ABC Company	4.02	67.87%	N/A	43.98%	N/A	N/A	N/A	67.00%
ABC Company (Post 2000)	3.98	67.82%	N/A	43.98%	N/A	N/A	N/A	67.00%

Footnotes:

The Mean Reversion represents the annualized volatility of the stock price over its entire stock history.

The volatility is calculated over a 52-week life at every point throughout a stock's history. This represents the median of three volatilities.

Peer volatility is the volatility volatility in the year (near) of the stock price as noted.

Represents the volatility selection for the peer reporting year as disclosed in their financial statements.

Key Assumptions – Volatility


- Implied volatility (or market implied volatility) is the volatility "implied" by the trading prices of publicly available stock options.
- In analyzing implied volatility, it is important to understand how varying the implied volatility may vary over time to predict how this may affect the use of implied volatility as a factor in determining expected volatility.
- A company would need a robust history of traded options – typically with terms of at least six months, based on SAB 107 comments
 - Terms less than six months: Not appropriate for calculating implied volatility
 - Terms between six and twelve months: May consider a blend of historical and implied volatility
 - Terms greater than twelve months: May consider relying exclusively on implied volatility

Valuation Results & Sensitivity Analysis

	Grant Price	Fair Value	% of Grant	Incremental Comparison	Cumulative Comparison
Weighted Average Grant Price	\$15.37				
Fair Value (ABC Company assumptions – B-S)		\$7.83	50.91%	0.00%	0.00%
Fair Value (revise Risk-Free Rate to 3.07% - B-S)		\$7.80	50.72%	-0.36%	-0.36%
Fair Value (revise Expected Volatility to 55.00% - B-S)		\$7.73	50.26%	-1.27%	-1.27%
Fair Value (Act Actuarial Binomial Model)		\$6.87	44.69%	-11.10%	-12.23%

Next Step Considerations

- How will new valuation and accounting rules impact your use and distribution of employee stock options in future?
- Will you continue to offer same types of options as you have used in the past?or will they be redesigned?
- How will you assess economic value for purposes of designing award levels in light of new valuation rules?
- Have you had preliminary discussions with your auditors on how they view compliance with the new rules?
- Is it worth doing some planning now to get ready for the impact of adoption of the new rules later in 2005?



Questions?

Thank you for your participation

