Stock Option Valuations: Stories from the Front

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Plan Sponsor Challenges – Hot Issues

- FAS 123R Accounting
- 409A Compliance
- SEC Proxy Disclosure of Executive Compensation
- Media scrutiny of executive compensation practices and levels
  - Back-dating and spring-loading options
  - Excessive compensation
- Long-term incentive design
  - Consideration of wealth accumulation
  - Portfolio approach

Plan Sponsor Challenges - Ongoing

Plan Design	▪ Aligning incentives with shareholder objectives ▪ Attraction and retention
Compensation	▪ How many options do we give? To whom? ▪ What's the right mix of options and stock?
Record Keeping	▪ Should we outsource stock plan administration? ▪ How are new rules affecting record keeping needs?
Taxation	▪ Qualified vs. nonqualified stock options ▪ Exemption from 162(m) deductible compensation limit
Valuation	▪ Assumptions used to value options ▪ Models used to value options
Accounting	▪ How will our plans affect our bottom line? ▪ How does 123R affect deferred taxes and EPS dilution?
Disclosure	▪ FAS 123R – Valuation and accounting methodologies ▪ Proxy disclosure of executive compensation

PART I: Introduction to Plan Design

Plan Design – Grant Type

- Stock options
- Restricted stock
- Restricted stock units (RSU's)
- Stock appreciation rights (SAR's)

Plan Design - Vesting

- Service Conditions
  - Cliff vesting: 100% after 3 years
  - Graded vesting: 25% per year over the next 4 years
- Performance Condition
  - Vesting conditioned on an internal metric (EPS, FDA approval, etc.)
  - Performance period may be specified
- Market Condition
  - Vesting conditioned on a metric related to stock performance
  - Performance period may be specified
  - Performance may be measured relative to a peer group
- Awards may have multiple vesting conditions
  - Service condition + performance-related acceleration
  - Tiered performance conditions

Emerging Trend: Performance-Based Equity Awards

- Awards with additional provisions related to performance
  - Individual performance
  - Company performance
  - Stock price performance

- Advantages
  - 162(m) qualified: Not subject to $1m deductible compensation limit
  - Performance objectives tailored to reward various outcomes
  - Specific performance objective communicated to participants
  - May result in less FAS 123R expense than a more plain-vanilla plan

Accounting for Performance Based Equity Awards

- "Performance Condition": Internal company metric or event
  - EPS, Net Income, ROIC, FDA approval
  - Management may have input as to the likely future outcome
  - May require forecasting or regression based on historical performance
  - If performance target is not met, expense will be reversed

- "Market Condition": Metric related to company share price
  - Absolute performance: Stock price level, total shareholder return
  - Relative performance: Stock price or return compared to peer group
  - If performance target is not met, expense will *not* be reversed

Valuation of Performance Based Equity Awards

- Award of full-value shares
  - Internal performance metric: Determine if target will be met. If so, must expense entire grant date market value
  - Market-based performance model: Lattice model or simulation
    - TSR-based awards: simulation
    - Stock price threshold for vesting: lattice model or simulation

- Award of options
  - Internal performance metric: Apply discount to grant date fair value of plain-vanilla award
  - Market-based performance model: Lattice model or simulation

PART II: Monte Carlo Simulation

Model for Stock Price Behavior

- Stochastic process: geometric Brownian motion
  - Change in stock price $\frac{\delta S}{S} = \mu\delta t + \sigma\varepsilon\sqrt{\delta t}$
    - μ is the constant expected rate of return per unit of time
    - σ is the constant annual volatility of the stock return
    - ε is a random drawing from a Standard Normal (0,1) distribution
- Monte Carlo Simulation: Iterative generation of stock price paths
  - Sample from the Standard Normal (0,1) distribution
  - Substitute sample in for ε, along with estimates of μ and σ
  - Sn = Sn-1 * exp(δS/S – dividend yield)

FAS 123R Valuation

- Valuation should be risk-neutral
  - μ = risk-free rate
  - Volatility and dividend assumption drive stock return
  - Consistent with assumptions underlying the Black-Scholes model
- Valuation must reflect all substantive characteristics of the plan
  - Build plan provisions on top of stock price simulation
  - Examples: Averaging periods, performance targets, rank among peers
- Consider model risk
  - More moving parts than the Black-Scholes and Lattice models
  - Engage in rigorous testing and documentation

Sample Stock Price Distribution

Stock Price: $24 Dividend Yield: 1.7% Volatility: 28%

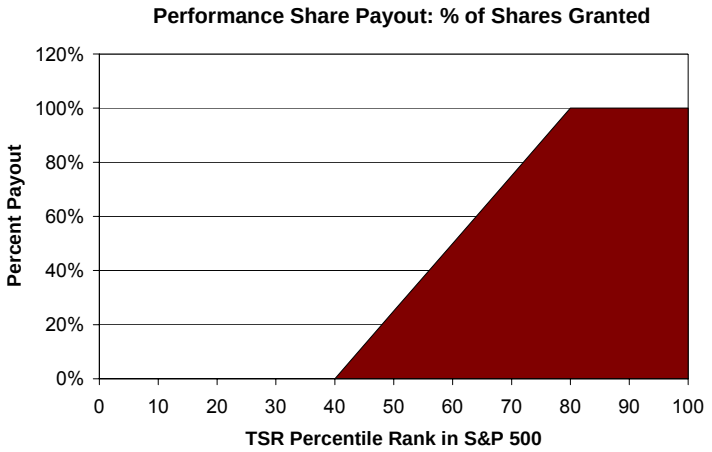
Risk-Free Rate: 4.6% Number of Trials: 5,000

Simulation Model Inputs

- Stock price – starting point for stock price simulation
- Strike price – needed if equity award is an option
- Dividend yield
- Risk-free rate
- Volatility – based on historical data, market-traded options, or peers
- Behavioral assumptions, if applicable
  - Exercise rate
  - Termination rate

PART III: Advanced Valuation Examples

Example 1: TSR Performance Shares

Performance Metric	Cumulative Total Shareholder Return percentile ranking within the S&P 500
Performance Period	4 performance periods per grant: 1-year, 2-year, 3-year, and 4-year
Payout Provisions	<u>Percentile</u> — <u>Payout</u> 80th or greater — 100% 60th — 50% 50th — 25% Below 40th — 0%  * Share payout is interpolated between payout percentages based on actual ranking. For example, if TSR is at the 70th percentile, payout is 75%.
Dividends	Performance shares will not be eligible for dividends until they vest.

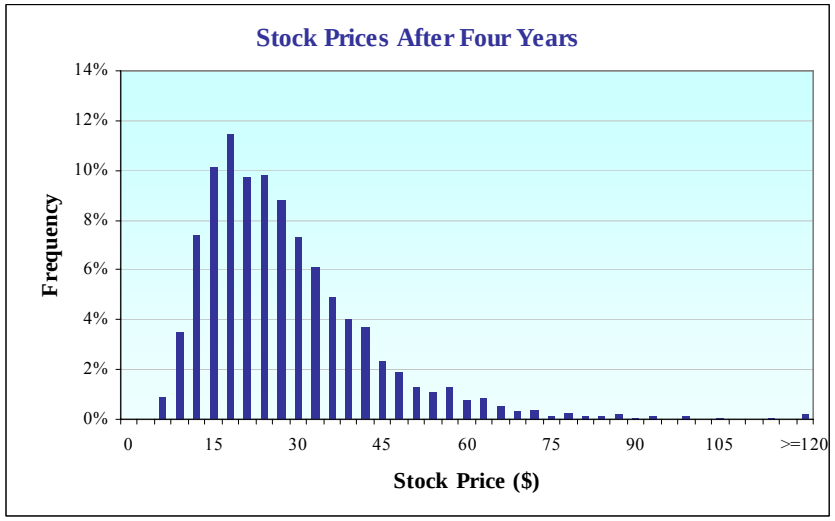
Example 1: TSR Performance Shares

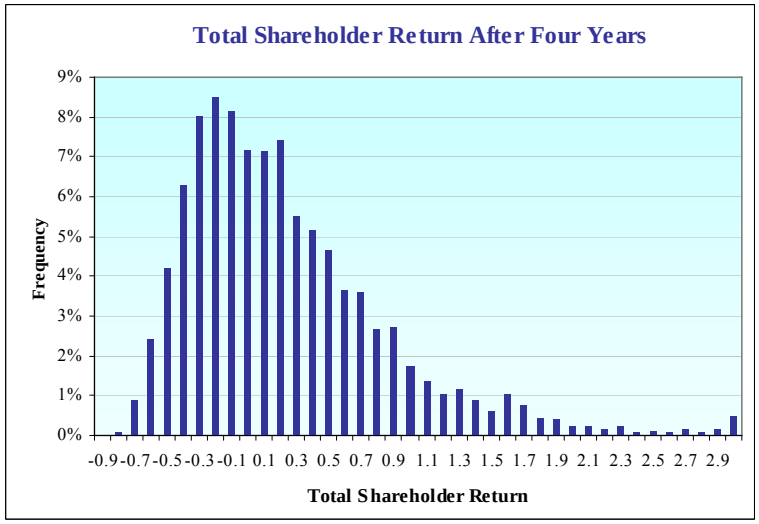
- Iterative simulation process
  - Simulate a 4-year path for all stocks in the S&P 500, with dividends
  - Compute Total Shareholder Return for all stocks for each period
  - Determine the rank of company stock among all S&P 500 stocks
  - Determine the payout associated with that rank
  - Discount payout back to grant date

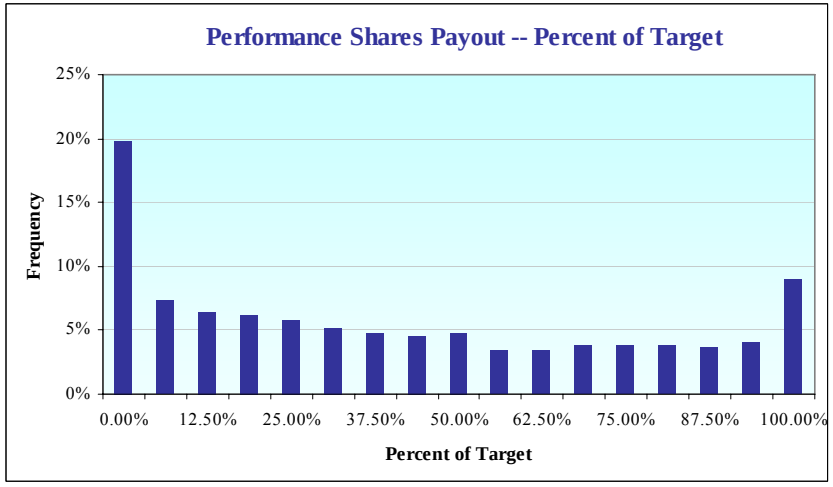
- Grant date fair value = Average over all trials

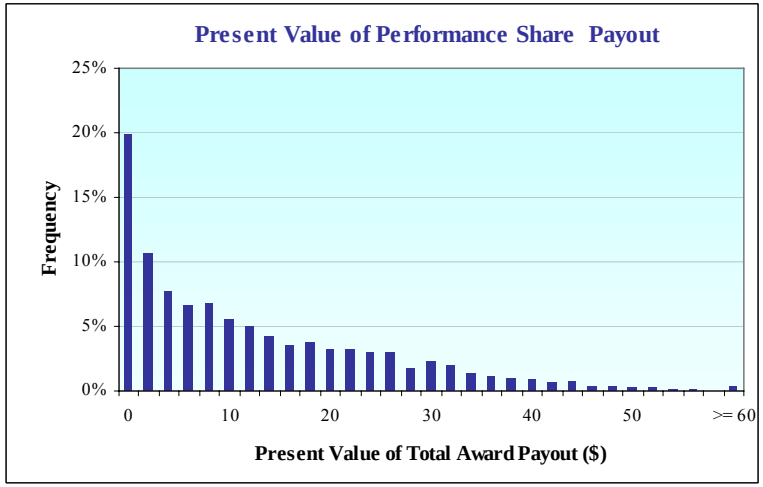
Initial Price	$23.62				
		Year 1	Year 2	Year 3	Year 4
End of Year Average Price		$24.20	$24.94	$25.57	$26.37
Average Cumulative Total Shareholder Return		4.95%	9.72%	14.44%	19.70%
Average Rank Percentile		49.38	49.08	48.87	48.94
Award Average Payout		38.65%	37.87%	37.61%	37.88%
Average Present Value of Award Payout		**$10.87**	**$11.37**	**$11.74**	**$12.23**
Percent of Initial Price		46%	48%	50%	52%
Average Total Payout Percentage					38.00%
Total Average Present Value of Award Payout					**$11.56**
Percent of Initial Price					49%
Average Present Value of Award Payout * Number of Shares Granted = Grant Date Fair Value					

Example 1: TSR Performance Shares









Example 2: Performance Options

- Company ABC grants options to employees which vest only if ABC's stock price appreciates 35% within 5 years of the grant date. This includes the event in which the stock price reaches the 35% threshold and then decreases

- To calculate the probability of the options vesting we will use the following assumptions:
  - Expected annual volatility (i.e. standard deviation) of stock returns: 40%
  - Measurement Period: Daily
  - Risk Free Rate: 4.9%
  - Current Stock Price: $25.00

Example 2: Performance Options

- We use a spreadsheet that simulates future stock price paths based upon geometric Brownian motion.
- We perform these simulations from time zero until the expected life of the option.
- At every measurement period we check to see if the vesting condition is achieved.
- The fair value for each simulation is calculated by discounting the intrinsic value at end of the simulation process to time zero with the risk- free rate of return. If the option does not vest a zero is recorded as the fair value.

Example 2: Performance Options

- By calculating the random returns many times (i.e. 100,000) the vesting percentage converges to approximately 68%.

			Time					
Trial			**0**	**1**	**2**	**3**	**4**	**5**
1	Stock Price		$ 25.00	$ 32.77	$ 23.94	$ 16.92	$ 20.17	$ 20.42
	Option Vests	Yes		No	Yes			
	Fair Value	$ -						
2	Stock Price		$ 25.00	$ 17.96	$ 16.43	$ 25.22	$ 43.49	$ 81.91
	Option Vests	Yes		No	No	No	No	Yes
	Fair Value	$ 44.80						
3	Stock Price		$ 25.00	$ 15.37	$ 9.57	$ 8.03	$ 5.07	$ 3.06
	Option Vests	No		No	No	No	No	No
	Fair Value	$ -						
4	Stock Price		$ 25.00	$ 33.39	$ 39.98	$ 36.84	$ 32.14	$ 27.03
	Option Vests	Yes		No	Yes			
	Fair Value	$ 1.60						
5	Stock Price		$ 25.00	$ 27.75	$ 27.37	$ 24.18	$ 19.95	$ 25.68
	Option Vests	Yes		No	No	No	No	Yes
	Fair Value	$ 0.54						
	Average Fair Value	$ 9.39						

Resources

- Options, Futures, and Other Derivatives (5th Ed.), by John C. Hull
- National Association of Stock Plan Professionals
- FAS 123R and SEC SAB 107
- AAA Stock Options Task Force – Practice Note

Questions