

# Stock Options

Presentation to ASWA-August 28, 2002

By

Vanessa Brown Claiborne, CPA/ABV, ASA  
Marc Katsanis, CPA, CFA  
Chaffe & Associates, Inc.

# What is a Stock Option?

- n Call Option: A contractual right to buy a share of stock, at a price, for a period of time.
- n Put Option: A contractual right to sell a share of stock, at a price, for a period of time.

# Types of Options

## Traded

- n Exchange Traded Options (ETOs)

## Employee Stock Options (ESOs)-Restricted

- n Qualified: Incentive Stock Options (ISOs) IRC Sec 422
- n NonQualified: Nonqualified Stock Options (NSOs)

# Terms to Know

Call Option-The right to buy a certain number of shares at a fixed price for a certain time period under certain circumstances

- n Exercise price or Strike price
- n Option Term
- n Vesting
- n In-the-money
- n Out-of-the-money
- n Volatility

# Terms to Know

Intrinsic Value = Fair Market Value of Stock -  
Exercise Price of Option

The amount by which the fair market value of the stock exceeds the exercise price of the ESO.

Present Value = Fair Market Value = Cash Value

The amount which a willing buyer would pay a willing seller for an ESO.

Present Value = Intrinsic Value + Time Value

# Current Statistics on ESO Use

- n Public/Private
- n Geography
- n Industry
- n Reason for Grant
- n Exercise period
- n Vesting
- n Exercise method and timing

# Current Stock Option Accounting

## FAS 123

- n Companies can elect to do the following:
  - Adopt the “pro forma” footnote disclosure of stock option expense
    - » Expense is not shown on the income statement unless options are in-the-money at grant date
  - Formally adopt FAS 123
    - » Expense is shown on the income statement

# Should Income Statement Treatment of Stock Options be Mandatory?

Yes

- n Alan Greenspan
- n Senator John McCain
- n Senator Carl Levin
- n Warren Buffett
- n IASB
- n Most Institutional Investor Groups

No

- n President George Bush
- n SEC Chair Harvey Pitt
- n Senator Joseph Lieberman
- n American Electronics Association
- n Many high tech companies

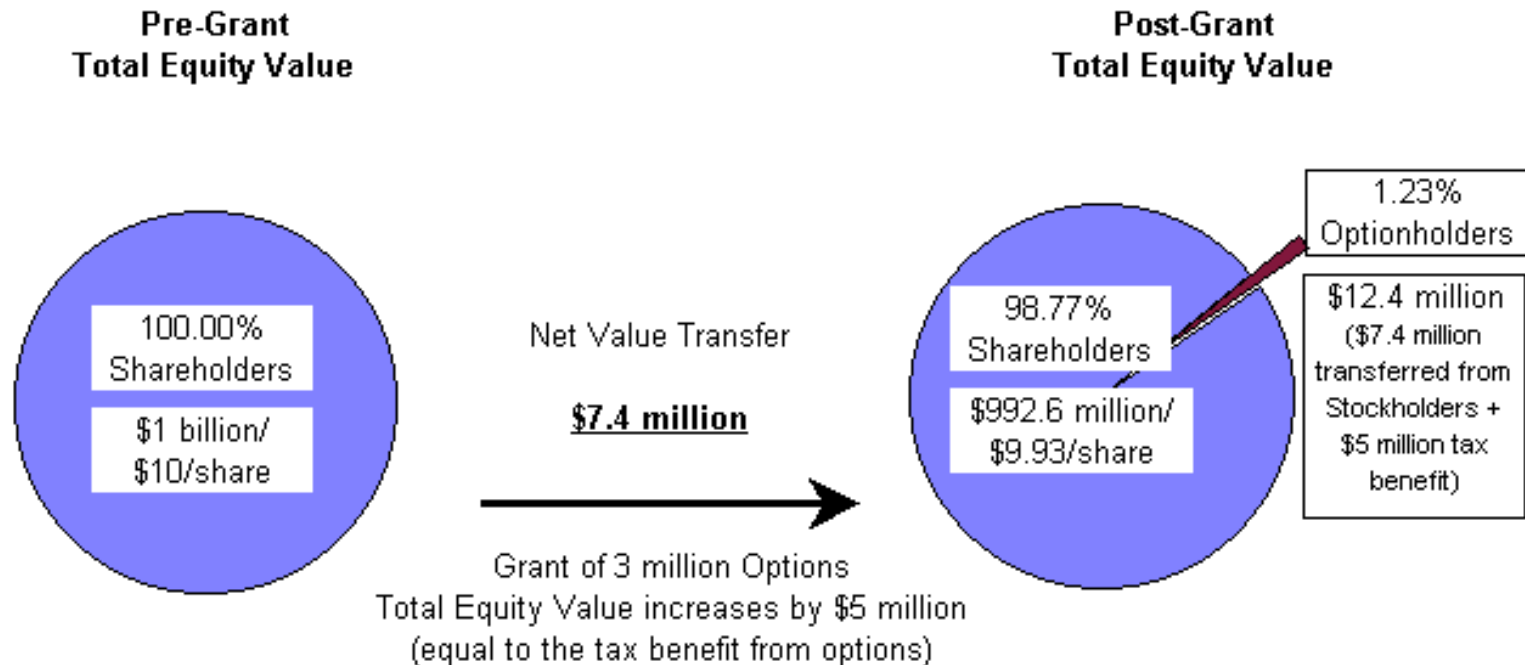
# Arguments for Expensing Options

- n The absence of a charge leads to large option grants, excessive shareholder dilution and lack of accountability for the “cost” of the grants
- n The absence of a charge results in an overstatement of earnings
- n Large option grants create excessive short term focus on stock price

# Arguments Against Expensing Options

- n Comparability
- n Options are not an expense but are a cost incurred by shareholders in the form of dilution and are reflected in the form of lower EPS
- n Traded option pricing models are inaccurate in their ability to predict the value of ESOs.

# The “Cost” of Options



Total Shareholder Value	\$1,000,000,000
Total Existing Optionholder Value	-
New Option Grant, Net of Tax	-
New Option Grant, Tax Benefit	-
<b>Total Equity Value</b>	<b><u>\$1,000,000,000</u></b>

Total Shareholder Value	\$ 992,600,000
Total Existing Optionholder Value	-
New Option Grant, Net of Tax	7,400,000
New Option Grant, Tax Benefit	5,000,000
<b>Total Equity Value</b>	<b><u>\$1,005,000,000</u></b>

# Arguments Against Expensing Options

- n Options are not an expense but are a cost incurred by shareholders in the form of dilution and are reflected in the form of lower EPS
- n Traded option pricing models are inaccurate in their ability to predict the value of ESOs.

# Black-Scholes Option Pricing Model

- n First published by Fischer Black and Myron Scholes
- n Most widely-used option pricing model
- n Inflexible
  - Cannot easily be adapted to value a large variety of options
- n Calculus based

# Black-Scholes Call Option Pricing Model

$$C = N(d_1)S - e^{-rt} N(d_2)K$$

$N(d_1)$  and  $N(d_2)$  are the cumulative normal distribution functions of  $d_1$  and  $d_2$  where

$$d_1 = \frac{\ln(S / K) + (r + \sigma^2 / 2)(t)}{\sigma \sqrt{t}}$$

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

$S$  = stock price

$K$  = exercise price

$C$  = value of the call option

$r$  = risk-free interest rate

$t$  = time until expiration in years

$\sigma$  = volatility of the stock

# Traded Option Models Require the Following Six Input Assumptions

- Exercise Price of the Option
- Term of the Option
- Current Stock Price
- Volatility of the Underlying Stock
- Risk Free Rate
- Dividend Yield of the Underlying Stock

# Example: Value a Traded Option

Using the Black-Scholes Model and these assumptions:

Exercise Price	\$10
Term of the Option	3 years
Stock Price	\$10
Volatility of Stock	70%
Risk Free Rate	5%
Dividend Yield of Stock	0%

**This Results in an “As If Traded”  
Present Value of \$4.96**

“With every passing week, more major companies are announcing plans to begin expensing the stock options they give their employees and executives as compensation. Now comes the hard part: deciding just how much those options are worth.”

The Wall Street Journal

August 6, 2002

# Why is So Difficult to Value ESOs?

## Hibernia Corp 2001 10-K

The Black-Scholes option valuation model was developed for use in estimating the fair value of traded options which have no vesting restrictions and are fully transferable. In addition, option valuation models require the input of highly subjective assumptions, including the expected stock price volatility. Because the Companys stock options have characteristics significantly different from those of traded options, and because changes in the subjective input assumptions can materially affect the fair value estimate, **in managements opinion the existing models do not necessarily provide a reliable single measure of the fair value of its employee and director stock options.**

# Traded Stock Options versus Employee Stock Options

Traded Stock Options: Freely transferable options that can be bought or sold on the open market. (The Black-Scholes was designed to value these.)

Employee Stock Options: Options that are granted to an employee as a form of compensation and usually cannot be bought or sold. (Valrex<sup>®</sup> was designed to value these.)

# The Difference Between Traded and Employee Stock Options

## Selling Privileges and a Liquid Market

Traded options have them, but

Employee options don't.

# Why are Selling Privileges Valuable?

- n They give an optionholder the privilege of cashing out of the option investment, even if the option is underwater.
- n They give an optionholder a means of hedging against the risk of future losses in the option.

# What is a Stock Option?

n Call Option: A contractual right to buy a share of stock, at a price, for a period of time.

n Put Option: A contractual right to sell a share of stock, at a price, for a period of time.

# The Valrex<sup>®</sup> Model for Valuing Employee Stock Options

Valrex values a non-traded option by stripping away a traded option's liquidity value.

Elements of a Traded Option's Value

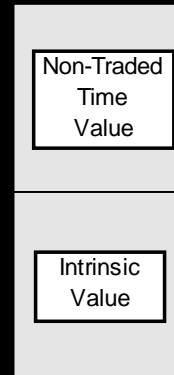
(Black-Scholes and Binomial models were developed to value these options)



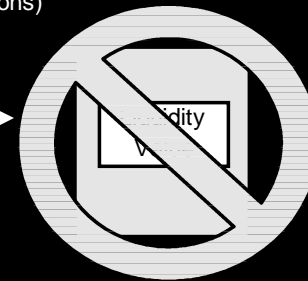
$$\begin{array}{r}
 \text{Liquidity Value (1)} \\
 \text{Non-Traded Time Value (2)} \\
 + \text{ Intrinsic Value (3)} \\
 \hline
 \text{Traded Option Value}
 \end{array}$$

Elements of a Non-Traded Option's Value

(The Valrex model was developed to value these options)



$$\begin{array}{r}
 \text{Non-Traded Time Value (2)} \\
 + \text{ Intrinsic Value (3)} \\
 \hline
 \text{Valrex Value}
 \end{array}$$



- (1) Liquidity Value is measured by calculating the cost to hedge against the risk of loss in the option by using a put-on-call option formula.
  - (2) Non-Traded Time Value is the time value not attributable to the liquidity of an option.
  - (3) Intrinsic value for a call option is the difference between the current fair market value of the stock and the exercise price of the option.
- For more information on the Valrex model see [www.valrexmodel.com](http://www.valrexmodel.com).

# How Much Does Selling Restrictions Reduce Value?

- n Generally, at the date of grant (assuming they are granted at-the-money) employee stock options should be discounted between 30% and 60% from their traded (Black-Scholes, Binomial) value
- n When the options are in-the-money the discounts to traded value are lower than for at-the-money options
- n When the options are out-of-the-money (underwater) the discounts to traded value are lower than for at-the-money options

# Example: Value an ESO

Using the Valrex Model and these assumptions:

Exercise Price	\$10
Term of the Option	3 years
Stock Price	\$10
Volatility of Stock	70%
Risk Free Rate	5%
Dividend Yield of Stock	0%

# Finding Valrex<sup>®</sup> Value

“As if” Traded Option Value

- Value of Selling Privileges

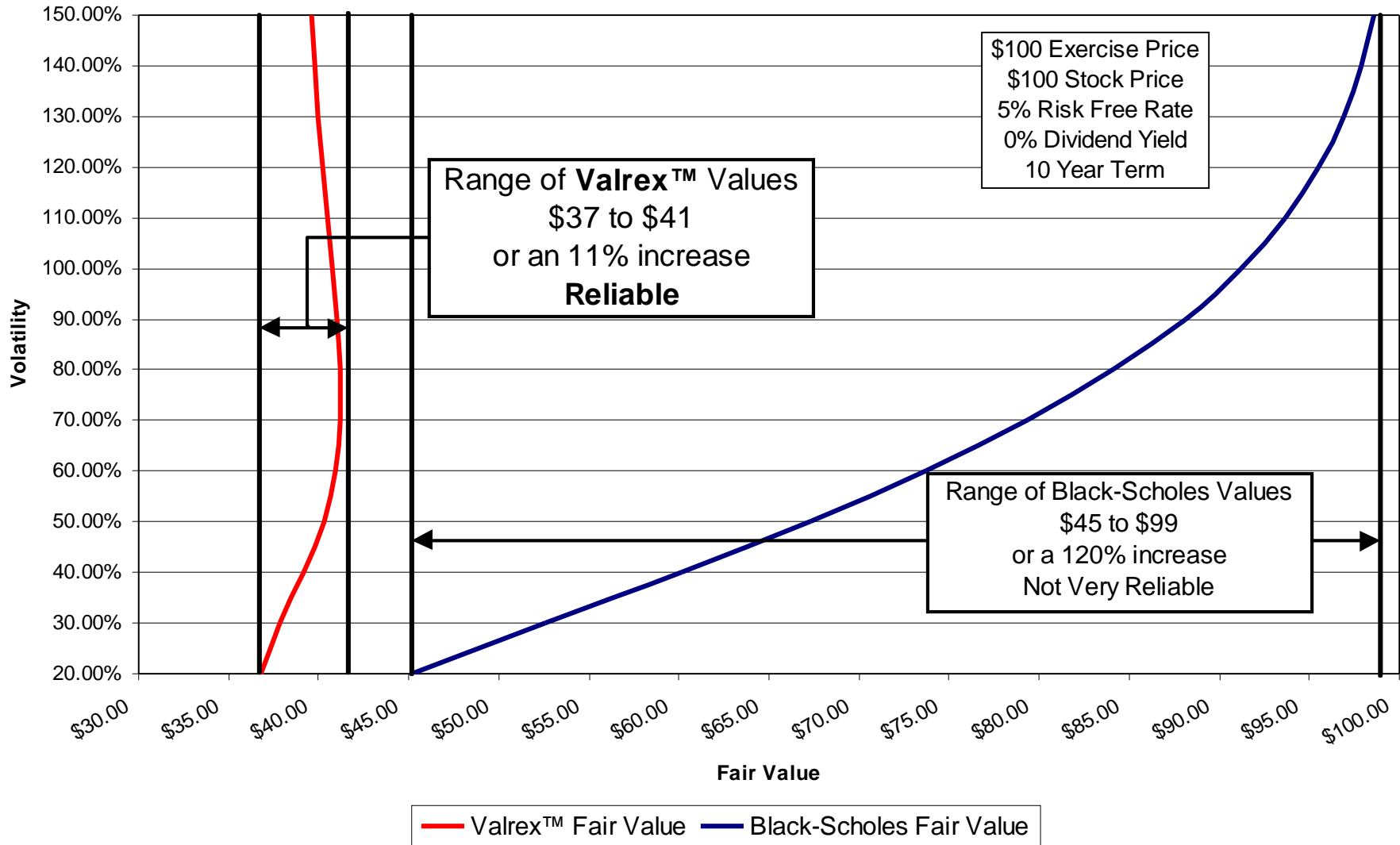
**Value of Employee Stock Option**

# Finding Valrex<sup>®</sup> Value

"As if Traded" Value	\$4.96
Less: Value of Selling Privileges	<u>(2.79)</u>
Valrex <sup>®</sup> Value	\$2.17

# Reliability Test--Valrex™ vs Black-Scholes

## At-the-Money Options



# How are Disclosures About Stock Options Likely to Change in the Future?

- n IASB/FASB will probably require companies to move option expense from the footnotes to the income statement
- n There will probably be more detailed and frequent (quarterly rather than annual) on options granted/forfeited/exercised, term to expiration, exercise price and term until vesting

## A Possible Solution

Improve disclosures about option grants so that investors who disagree with the way companies value their options can perform their own valuations.

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Vanessa Brown Claiborne, CPA/ABV, ASA

Marc Katsanis, CPA, CFA

Chaffe & Associates, Inc.

601 Poydras St., Suite 2424

New Orleans, LA 70130