Sally jameson stock options essay sample

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1. Describe, in general terms, Sally's Executive Stock Option decision. You should recognize this as an NPV problem that compares alternative future cash flows. What is the NPV of the cash alternative? The cash alternative being referred to here is the Telstar Communications option tranche on offer, the present value of which needs to be compared with that of the cash option. • • PV [Cash Option]: $5, 000. 000 PV [Stock Options]: $11, 724. 000 • Calculated using Black Scholes Option Valuation Model (approach / methodology follows)

2. Describe Sally's ESOs in terms of the parameters which would be input into an option pricing model. Which option pricing model is appropriate? • Sally is being offered 3, 000 options to purchase Telstar Communications shares at $35. 000 on her fifth anniversary with the firm. In other words, Sally is being granted the right to, but not the obligation to, purchase these shares on (not before) her fifth anniversary with Telstar. Since Sally cannot exercise her options before five years with the firm, these are European

options, which can be valued using the Black Scholes Options Valuation Model. The Black Scholes Options Valuation Model requires the following input parameters: • Current Stock Price: $18. 750 • Call Option Strike Price: $35. 000 • Time to Maturity (years): 5. 000 • Annual Interest Rate: On May 27 1992, treasury security yields on 5-Year T-Bills was 6. 02% – the risk free rate on five year securities can therefore be modeled with certainty. • Given the availability of current Telstar call option prices, the implied volatility required for the calculation of the value of Sally's ESO can also be estimated (see next response). • As stated in the case, it can also be assumed with relative certainty that Telstar would not pay a dividend on its stock over the five year horizon in consideration i. e. the average dividend can be assumed to be 0.

3. In particular, evaluate the question of Telstar's stock price volatility. Using the Black Scholes Calculator, determine what volatility estimate the market is using to price the publicly traded Telstar options. For what periods of time are these volatilities implied? What factors are important in determining the volatility estimate to use in valuing Sally's ESOs? In your judgement, what value of volatility should be used to value the ESOs? Given the fact that the stock options being offered to Sally are long-term options, it makes sense to use prices pertaining to the long-term publicly-traded Telstar call options. Long-term Telstar Call Options are priced as follows on January 22nd, 1994. Strike Price $12. 50 $17. 50 $20. 00 22-Jan-94 $7. 750 $4. 625 $3. 750

Given this information, the implied volatility in each can be calculated (using the Black Scholes Calculator) to be as follows. Strike Price $12. 50 $17. 50 $20. 00 AVERAGE 22-Jan-94 35. 220% 34. 920% 37. 560% 35. 900%

The implied volatility pertains to the period 1year, 7 months and 26 days (May 27, 1992 – Jan 22, 1994) The factors important in determining the implied volatilities tabulated above include the current stock price, the call option strike price, the time to maturity of the option in consideration, the approximate interest rate associated with that period and the assumed dividend yield. As can be seen in the table above, the average volatility implied in the prices at which long-term Telstar call options are trading is 35. 900%. This is the estimated volatility I intend to use in my calculation of Sally's stock options.

4. What is your estimate of the value of Sally's ESO package? If you were to take the options and gamble on the stock price going forward, what percentage of the time do you think you would make more than what Black Scholes calculates? CALL OPTIONS: Telstar Communications S: Stock Price ($) $ 18. 75000 X: Strike or Exercise Price ($) $ 35. 00000 T: Time to Maturity (years) 5. 00000 r: Annual Interest Rate 0. 06020 s: Annual Standard Deviation 0. 35900 d: Asset Yield –

Entering the above parameters into the Black Scholes Calculator yields an option price of $3. 908 for the ESOs being offered to Sally. Assuming the Black Scholes Option Valuation Model provides the mean valuation from a distribution of equally likely price paths, I would imagine that I would make more than what Black Scholes calculates half the time, and less half the time.

5. What should Sally do? Why? • • • • Cash being offered: $5000. 000 Value of Executive Stock Options: $3. 908 x 3, 000 = $11, 724. 000 It thus appears

that the value of the ESOs being offered to Sally is more than twice the value of the cash being offered to her. Having said that, it's worthwhile noting that there's a difference in risk being undertaken in each case: • There is no risk associated with opting for the cash option. • Opting for the ESOs is subject to risk – it's possible that her options will be worthless at the time of exercise. Moreover, Sally may want to leave the company before five years with it, in which case she would lose her options. I would recommend that Sally take the stock options given their much higher valuation, as long as her risk appetite allows for the gamble.