

Session 22: Post class test solutions

1. **d. Invest, but only if the expansion potential comes with exclusivity and you believe that the option to expand has a value greater than \$50 million.**
The initial investment has a net present value of -\$50 million. For the expansion potential to tip the scales, its value has to be greater than \$50 million and that can happen only if there is exclusivity.
2. **Inputs to the option pricing model**
 - a. $S = 300$ = PV of cash flows, if you expand today
 - b. $K = 500$ = Cost of expansion today
 - c. $r = 3\%$
 - d. $t = 15$ (Years of patent life left)
 - e. $\sigma = 25\%$ (from simulation)
 - f. γ (Cost of delay) = $1/15$ (You will lose one year of patent life by waiting)Bonus: The value that I get for d_1 , d_2 and the option are below:
 $d_1 = -0.6115$, $N(d_1) = 0.2704$
 $d_2 = -1.5798$, $N(d_2) = 0.0571$
Value of the option to expand = \$11.65 million. You would add this to your DCF value.
3. **e. A long term, large, risky investment to a small company.** The option to abandon will have more value in a risky project than a safe one, a longer term project than a shorter term one and on a large project (relative to the size of the company taking it) than a small one.
4. **c. Company has limited access to capital markets, has positive excess returns and is uncertain about its future investment needs.** For financial flexibility to have value, you have to be uncertain about your future investment needs, make excess returns on those investments and have restricted access to capital markets.