Quiz D: 4/11/12

**Quiz:** Suspend Campaign Company has a current stock price of $40. For the next two years, Suspend’s stock price will either rise by $5 per share or fall by $3 per share.

a. Set up the calculations needed to determine the value of a call today with a strike price of $40 if the risk-free interest rate is 2% per year and is not expected to change.

b. Set up the calculations needed to determine how many bonds would you need to buy or sell a year from today if Suspend’s stock price rises by $5 per share next year?

**Note:** Bonus WSJ Questions on back of page

\[ u = 40 + 5 = 45; \quad d = 40 - 3 = 37 \]

\[ u^2 = 40 + 5 + 5 = 50; \quad d^2 = 40 - 5 - 3 = 32 \]

\[ K = 40 \]

\[ C_{uu} = 50 - 40 = 10; \quad C_{ud} = C_{du} = 42 - 40 = 2; \quad C_{dd} = 0 \]

\[ t = \frac{1}{2} \]

\[ (u - d) = \frac{50 - 37}{10} = \frac{13}{5} \]

\[ 
\begin{align*}
C & = (1.25) - 39.26 = -39.26 + 1.25 = -38.01 \\
\Delta & = \frac{2 - 0}{1.25 - 0.916} = 0.6085
\end{align*} 

\[ (d = 0.6085 (1.25)) - 21.174 = 3.166 \]

1) Change in stock: \( 40 + 2 \times 0.6085 = 43.91 \)
   
   \[ \Rightarrow \text{buy} \ 3.915 \text{ shares for} \ 39.15 \times 45 = 17,617.5 \\
   \]

2) Short sell 17,617.5 shares at 17.6175.

or 2) Bonds if do nothing: \( -2(1.6744 \times 0.6085) = -21.5975 \)
   
   \[ \Rightarrow \text{change in bonds} = -39.25 - 1 - 21.5975 \]

\[ + 2 \Rightarrow \text{short sell} 17.615 \text{ of bonds} \]

\[ = -17.618 \]