

Quiz B for 2:30 Class: 11/14/12

Name Key

Use the following information to set up the calculations required to determine a) the portfolio of Microsoft (MSFT) stock and risk-free bonds required to duplicate a call on MSFT that expires on 7/19/13 (247 days from today) with a strike price of \$26 and to b) determine the beta of the call. You plan to hold the call for 168 days through 5/1/13.

Information on market values per share of:

MSFT assets = 30; MSFT stock = 27.15; MSFT bonds = 2.85; this call = 2.65; an equivalent put = 1.77

Information on book values per share of:

MSFT assets = 15; MSFT stock = 13; MSFT bonds = 2

Information on standard deviation of returns on:

MSFT assets = 19%; MSFT stock = 23%; MSFT bonds = 3%; this call = 40%; an equivalent put = 70%

Information on betas on:

MSFT assets = 1.05; MSFT stock = 1.17; MSFT bonds = 0.15

Information on required returns on:

MSFT assets = 8.3%; MSFT stock = 9.2%; MSFT bonds = 2.1%

Information on expected dividends on MSFT stock: 2/14 (92 days) = 0.29; 5/15 (182 days) = 0.30; 8/16 (275 days) = 0.31

Information on returns on Treasury returns (all < 1%) maturing on: 2/14 = 0.091%; 5/2 = 0.132%; 5/15 = 0.142%; 7/18 = 0.157%; 8/15 = 0.162%

Wall Street Journal Questions are on the back of this page.

+4 $\beta_c = \left(\frac{\Delta S^X}{\Delta S^X + B} \right) \beta_S = \left(\frac{\Delta S^X}{\Delta S^X + B} \right) 1.17$ (10)

+4 $d = X / (dc)$ (11)

+4 $d_1 = \frac{\ln\left(\frac{S^X}{PV(K)}\right)}{\sigma \sqrt{T}} + \frac{\sigma \sqrt{T}}{2} = \frac{\ln\left(\frac{S^X}{PV(K)}\right)}{0.23 \sqrt{\frac{247+2}{365}}} + \frac{0.23 \sqrt{\frac{247+2}{365}}}{2}$ (14)

+4 $S^X = 27.15 - \frac{0.29}{(1.092)^{\frac{92}{365}}} - \frac{0.30}{(1.092)^{\frac{182}{365}}}$ (17)

+4 $PV(K) = \frac{26}{(1.00157)^{\frac{247}{365}}}$ (16)

+4 $B = -PV(K) N(d_2)$ (4)

+4 $d_2 = d_1 - \frac{0.23 \sqrt{\frac{247+2}{365}}}{2}$ (9)

+1 $N(x) =$ look up on tables or in Excel