Quiz A for 9:45 Class: 08/01/13

Notes: In solving the following I recommend setting up a table. Answer everything on a per-share basis. Use a "+" for an inflow and a "-" for an outflow. I will assume an inflow if no sign is given.

Assume Facebook’s stock trades at $36.80 per share and that the price of a call that expires on 9/21/13 (51 days from today) with a $40 strike price is $1.24 and that the price of a put that expires on 9/21/13 (51 days from today) with a strike price of $40 is $4.00. Assume also that the risk-free interest rate is 0.8%

a. What set of transactions today will earn you an arbitrage profit today? What is your profit?
b. What cash flows will your individual transactions today create one year from today if Facebook’s stock ends up at $36 on 9/21 and if Facebook’s stock ends up at $43 on 9/21? What are the total cash flows for your arbitrage portfolio on 9/21 if Facebook’s stock ends up at $36 and if it ends up at $43?
c. What transactions or actions on 9/21 generate each of the individual cash flows in part (b) if Facebook’s stock price ends up at $43? Note: Be sure to specify where each transaction occurs.

\[ S + P = C + PV(\frac{\alpha}{\beta}) \]
\[ 36.8 + 1.24 = 1.24 \times \frac{40}{(1.008)^{51}} = 39.96 + 34.95 \]

\[ 40.8 \neq 41.95 \]

<table>
<thead>
<tr>
<th>Trans</th>
<th>CF0</th>
<th>CF1</th>
</tr>
</thead>
<tbody>
<tr>
<td>+5 Buy stock</td>
<td>-36.8</td>
<td>+36</td>
</tr>
<tr>
<td>+5 Buy put</td>
<td>-4</td>
<td>+4</td>
</tr>
<tr>
<td>+5 Sell call</td>
<td>+1.24</td>
<td>0</td>
</tr>
<tr>
<td>Short risk-free bond</td>
<td>+39.96</td>
<td>-40</td>
</tr>
</tbody>
</table>

\[ \text{Total: } 40 + 4 = 44 \]

(a) Sell stock for $43 in market
(b) Don't exercise put
(c) Buy stock for $43 in market
(d) Buy bond for $40 in market + return to lender of bond
(e) Pay $40 to lender of bond