MANAGERIAL FINANCE 320 (MFN710S)

DATE: 13 September 2019
DURATION: 2 Hours
MARKS: 50

TEST 2 MARKING GUIDE

INSTRUCTIONS

REQUIREMENTS: Silent, non-programmable calculators

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This marking guide consists of 6 pages including this cover page but excluding the tables
QUESTION 1 [30 MARKS]

a) Calculate the standard deviation of returns for each of the shares.

<table>
<thead>
<tr>
<th>SHARE A</th>
<th>State</th>
<th>Prob</th>
<th>Return</th>
<th>ER</th>
<th>Deviation</th>
<th>Deviation²</th>
<th>Deviation²(Prob)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.3</td>
<td>0.02</td>
<td>0.0060</td>
<td>-0.06</td>
<td>0.0036</td>
<td>0.0011</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0.5</td>
<td>0.10</td>
<td>0.0500</td>
<td>0.02</td>
<td>0.00</td>
<td>0.0002</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>0.2</td>
<td>0.12</td>
<td>0.0240</td>
<td>0.04</td>
<td>0.00</td>
<td>0.0003</td>
<td></td>
</tr>
<tr>
<td>ER</td>
<td></td>
<td></td>
<td></td>
<td>0.0800</td>
<td></td>
<td>0.0016</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td></td>
<td></td>
<td></td>
<td>0.040</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SHARE B</th>
<th>State</th>
<th>Prob</th>
<th>Return</th>
<th>ER</th>
<th>Deviation</th>
<th>Deviation²</th>
<th>Deviation²(Prob)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.3</td>
<td>0.15</td>
<td>0.0450</td>
<td>0.00</td>
<td>0.0000</td>
<td>0.0000</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0.5</td>
<td>0.22</td>
<td>0.1100</td>
<td>0.07</td>
<td>0.00</td>
<td>0.0024</td>
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</tr>
<tr>
<td>3</td>
<td>0.2</td>
<td>-0.02</td>
<td>-0.0040</td>
<td>-0.17</td>
<td>0.03</td>
<td>0.0058</td>
<td></td>
</tr>
<tr>
<td>ER</td>
<td></td>
<td></td>
<td></td>
<td>0.1510</td>
<td></td>
<td>0.0082</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td></td>
<td></td>
<td></td>
<td>0.091</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

✓ = ½ mark

b) Compute the coefficient of variation

<table>
<thead>
<tr>
<th></th>
<th>SHARE A</th>
<th>SHARE B</th>
</tr>
</thead>
<tbody>
<tr>
<td>ER</td>
<td>0.0800</td>
<td>0.1510</td>
</tr>
<tr>
<td>SD</td>
<td>0.040</td>
<td>0.091</td>
</tr>
<tr>
<td>CV</td>
<td>0.50 (P)</td>
<td>0.60 (P)</td>
</tr>
</tbody>
</table>

- NBL should invest in share A✓, because it exposes NBL to a lesser unit of risk✓ (✓ = 1 mark)

c) The correlation between the Share A and Share B = -0.00066/0.04*0.091 = -0.1819✓ (✓ = 1 mark)
d) Determine the expected return together with the risk of the portfolio

Return on portfolio = (0.4 x 8)(0.6 x15.1) = **12.26%, ✓✓**

Standard Deviation of portfolio \( \sigma_{AB} = \sqrt{W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + 2 W_A W_B \sigma_A \sigma_B \text{Cov}_{AB}} \)

\[
\sigma_{AB} = \sqrt{0.4^2 \times 0.0016 + 0.6^2 \times 0.0082 + 2 \times 0.4 \times 0.6 \times 0.00066} = 0.05385 \text{ or } 5.385\% \ 
\]

- NBL should invest in the portfolio✓ because:
- The portfolio return (12.26%) is greater than the market return of 12%. ✓✓
- The portfolio risk (5.47%) is lower than the market risk of 6%. ✓✓
- The shares are negatively correlated; there is substantial reduction in risk per $1 return. ✓✓ (✓=1 mark)

e) Calculate the equity beta of shares A and B

\[
\beta_A = \frac{\text{Cov}(R_a,R_m)}{\sigma^2_m} = \frac{25.2}{6^2} = 0.7✓
\]

\[
\beta_B = \frac{\text{Cov}(R_a,R_m)}{\sigma^2_m} = \frac{39.6}{6^2} = 1.1✓
\]

f) Calculate the required return of Shares A and B according to CAPM

\[
R_A = R_f + \beta(R_m-R_f) = 3\% + 0.7(12-3) = 9.3%✓✓
\]

\[
R_B = R_f + \beta(R_m-R_f) = 3\% + 1.1(12-3) = 12.9%✓✓
\]

g) List any three (3) limitations of the Capital Asset Pricing Model (CAPM)

- Investors hold diversified portfolios✓
- Single-period transaction horizon✓
- Investors can borrow and lend at the risk-free rate of return✓
- Perfect capital market✓ (any 3)
QUESTION 2

[20 MARKS]

a) Company’s cost of equity based on the CAPM

\[ K_e = R_f + B(R_m - R_f) = 7.5\% + 1.1 \times 5\% = 13\% \]

b) Market value of the bond

\[
B_0 = \frac{I_1}{(1+r)^1} + \frac{I_2}{(1+r)^2} + \frac{I_3}{(1+r)^3} + \ldots + \frac{I_n}{(1+r)^n} + P_n
\]

\[ B_0 = N$8 \times PVFA (12\%;5Yrs) + N$100 \times PVIF (12\%;5Yrs) \]

\[ = N$8 \times 3.6048 + 100 \times 0.5674 = N$28.84 + 56.74 = N$85.58 \]

c) After tax cost of debt

\[ K_d = K_i (1-T) \]

\[ K_d = 12\% \times (1-28\%) = 8.64\% \]

d) Company’s cost of equity using the Dividend Growth Model

\[ K_e = \frac{D_1}{P_o} + g \]

\[ = 0.1284 + 7\% = 2.30 = 12.58\% \]

e) Weighted Average Cost of Capital (WACC)

\[ 30\% \times 8.64\% + 70\% \times 13\% = 8.59 + 9.1 = 11.69\% \]

f) Limitations of the Dividend Growth Model

Limited Use - the model is only applicable to mature, stable companies who have a proven track record of paying out dividends consistently.

May not be related to earnings - the model implicitly assumes that the dividends paid out are correlated to earnings.

Too many assumptions - the dividend discount model is full of too many assumptions.

Tax efficiency - in many countries, it may not be efficient to pay dividends.

Control - the model is not applicable to large shareholders. = 1 mark

(Any 3 x 1 = 3 marks)

End of Test Paper