Assume you are planning to invest 60% of your funds in Adobe Systems (ADBE) and 40% of your funds in Lowe's (LOW). Use the following returns to set up the calculations needed to determine:

a. the standard deviation of your portfolio if you invest all of your funds in Adobe
b. the standard deviation of your portfolio if you invest all of your funds in Lowe's
c. the covariance between Adobe and Lowe's

d. the standard deviation of returns on your portfolio of 60% in Adobe and 40% in Lowe's

Return on:

<table>
<thead>
<tr>
<th>Year</th>
<th>ADBE</th>
<th>LOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>22%</td>
<td>45%</td>
</tr>
<tr>
<td>2011</td>
<td>−6%</td>
<td>11%</td>
</tr>
<tr>
<td>2010</td>
<td>2%</td>
<td>17%</td>
</tr>
<tr>
<td>2009</td>
<td>67%</td>
<td>21%</td>
</tr>
</tbody>
</table>

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

\[
\alpha \left( R_{ADBE} = \frac{1}{4}(22 - 6 + 2 + 6) \right) = A \quad \text{①}
\]

\[
\sigma (\text{ADBE}) = \frac{1}{3} \left( (22 - A)^2 + (-6 - A)^2 + (2 - A)^2 + (6 - A)^2 \right) \quad \text{②}
\]

\[
\bar{R}_{LOW} = \frac{1}{4} (45 + 11 + 17 + 21) = L \quad \text{⑦}
\]

\[
\sigma (\text{LOW}) = \sqrt{\frac{1}{3} \left( (45 - L)^2 + (11 - L)^2 + (17 - L)^2 + (21 - L)^2 \right)} \quad \text{⑦}
\]

\[
\text{Cov}_{ADBE, LOW} = \frac{1}{3} \left( (22 - A)(45 - L) + (-6 - A)(11 - L) + (2 - A)(17 - L) + (6 - A)(21 - L) \right) \quad \text{④}
\]

\[
\rho \left( R_{ADBE}, R_{LOW} \right) = \sqrt{\frac{(0.4)^2 \sigma^2_{ADBE} + (0.4)^2 \sigma^2_{LOW} + 2(0.4)(0.4) \text{Cov}_{ADBE, LOW}}{\sigma_{ADBE} \sigma_{LOW}}} \quad \text{⑧}
\]