CHAPTER 12
SOME LESSONS FROM CAPITAL MARKET HISTORY

Answers to Concepts Review and Critical Thinking Questions

1. They all wish they had! Since they didn’t, it must have been the case that lomega’s stellar performance was not foreseeable, at least not by most.

2. As in the previous question, it’s easy to see after the fact that the investment was terrible, but it probably wasn’t so easy ahead of time.

3. No, stocks are riskier. Some investors are highly risk averse, and the extra possible return doesn’t attract them relative to the extra risk.

4. On average, the only return that is earned is the required return—investors buy assets with returns in excess of the required return (positive NPV), bidding up the price and thus causing the return to fall to the required return (zero NPV); investors sell assets with returns less than the required return (negative NPV), driving the price lower and thus the causing the return to rise to the required return (zero NPV).

5. The market is not weak form efficient.

6. Yes, historical information is also public information; weak form efficiency is a subset of semistrong form efficiency.

7. Ignoring trading costs, on average, such investors merely earn what the market offers; the trades all have zero NPV. If trading costs exist, then these investors lose by the amount of the costs.

8. Unlike gambling, the stock market is a positive sum game; everybody can win. Also, speculators provide liquidity to markets and thus help to promote efficiency.

9. The EMH only says, within the bounds of increasingly strong assumptions about the information processing of investors, that assets are fairly priced. An implication of this is that, on average, the typical market participant cannot earn excessive profits from a particular trading strategy. However, that does not mean that a few particular investors cannot outperform the market over a particular investment horizon. Certain investors who do well for a period of time get a lot of attention from the financial press, but the scores of investors who do not do well over the same period of time generally get considerably less attention from the financial press.

10. a. If the market is not weak form efficient, then this information could be acted on and a profit earned from following the price trend. Under ii, iii, and iv, this information is fully impounded in the current price and no abnormal profit opportunity exists.
b. Under ii, if the market is not semistrong form efficient, then this information could be used to buy the stock "cheap" before the rest of the market discovers the financial statement anomaly. Since ii is stronger than i, both imply that a profit opportunity exists; under iii and iv, this information is fully impounded in the current price and no profit opportunity exists.

c. Under iii, if the market is not strong form efficient, then this information could be used as a profitable trading strategy, by noting the buying activity of the insiders as a signal that the stock is underpriced or that good news is imminent. Since i and ii are weaker than iii, all three imply that a profit opportunity exists. Under iv, this information does not signal any profit opportunity for traders; any pertinent information the manager-insiders may have is fully reflected in the current share price.

Solutions to Questions and Problems

Basic

1. \[ R = \left( \frac{\$1.25 + (\$45 - \$62)}{\$62} \right) / \$62 = -25.40\% \]

2. Dividend yield = $1.25 / $62 = 2.02% ; Capital gains yield = $(\$45 - \$62) / \$62 = -27.42\%

3. \[ R = \left( \frac{\$1.25 + (\$75 - \$62)}{\$62} \right) / \$62 = 22.98\% \]
Dividend yield = $1.25 / $62 = 2.02% ; Capital gains yield = $(\$75 - \$62) / \$62 = 20.96\%

4. \[ $110 + $925 - $955 = $80; R = [\$110 + (\$925 - \$955)] / \$955 = 8.38\% \]
   \[ r = \left( \frac{1.0838}{1.04} - 1 \right) = 4.21\% \]

5. \[ r = \left( \frac{1.127}{1.032} - 1 \right) = 9.21\% \]

6. \[ r_G = \frac{1.054}{1.032} - 1 = 2.13\%; r_R = \frac{1.06}{1.032} - 1 = 2.71\% \]

7. \[ \bar{X} = \left[ \frac{\sum_{i=1}^{5} x_i}{N} \right] = 7.00\% ; \bar{Y} = \left[ \frac{\sum_{i=1}^{5} y_i}{N} \right] = 9.20\% \]

\[ s_y^2 = \left( \frac{\sum_{i=1}^{5} (y_i - \bar{Y})^2}{(N-1)} \right) \]

\[ = \frac{1}{5-1} \left\{ (0.07)^2 + (0.07)^2 + (0.07)^2 + (0.07)^2 + (0.07)^2 \right\} = 0.01035 \]

\[ s_y^2 = \frac{1}{5-1} \left\{ (-0.92)^2 + (-0.92)^2 + (-0.92)^2 + (-0.92)^2 + (-0.92)^2 \right\} = 0.04797 \]

\[ s_X = \sqrt{0.01035} = 0.10173 = 10.17\% ; s_R = \sqrt{0.04797} = 0.219 = 21.9\% \]
### SOME LESSONS FROM CAPITAL MARKET HISTORY

#### 8.

<table>
<thead>
<tr>
<th>Year</th>
<th>Small co. stock return</th>
<th>T-bill return</th>
<th>Risk premium</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>39.88%</td>
<td>11.24%</td>
<td>28.64%</td>
</tr>
<tr>
<td>1981</td>
<td>13.88</td>
<td>14.71</td>
<td>-0.83</td>
</tr>
<tr>
<td>1982</td>
<td>28.01</td>
<td>10.54</td>
<td>17.47</td>
</tr>
<tr>
<td>1983</td>
<td>39.67</td>
<td>8.80</td>
<td>30.87</td>
</tr>
<tr>
<td>1984</td>
<td>-6.67</td>
<td>9.85</td>
<td>-16.52</td>
</tr>
<tr>
<td>1985</td>
<td>24.66</td>
<td>7.72</td>
<td>16.94</td>
</tr>
<tr>
<td>1986</td>
<td>6.85</td>
<td>6.16</td>
<td>0.69</td>
</tr>
<tr>
<td></td>
<td>146.28</td>
<td>69.02</td>
<td>77.26</td>
</tr>
</tbody>
</table>

**a.** Small company stocks: average return = 146.28 / 7 = 20.90%

T-bills: average return = 69.02 / 7 = 9.86%

**b.** Small company stocks:

\[
\text{variance} = \frac{1}{6} \left( \frac{(.3988 - .2090)^2 + (.1388 - .2090)^2 + (.2801 - .2090)^2 + (.3967 - .2090)^2 + (-.0667 - .2090)^2 + (.2466 - .2090)^2 + (.0685 - .2090)^2}{6} \right) = 0.0297
\]

standard deviation = \( \sqrt{0.0297} \) = 0.1724 = 17.24%

T-bills:

\[
\text{variance} = \frac{1}{6} \left( \frac{(.1124 - .0986)^2 + (.1471 - .0986)^2 + (.1054 - .0986)^2 + (.0880 - .0986)^2 + (.0985 - .0986)^2 + (.0772 - .0986)^2 + (.0616 - .0986)^2}{6} \right) = 0.0007547
\]

standard deviation = \( \sqrt{0.0007547} \) = 0.0275 = 2.75%

**c.** Average observed risk premium = 77.26 / 7 = 11.04%

\[
\text{variance} = \frac{1}{6} \left( \frac{(.2864 - 1.104)^2 + (-.0083 - 1.104)^2 + (.1747 - 1.104)^2 + (.3087 - 1.104)^2 + (-.1652 - 1.104)^2 + (.1694 - 1.104)^2 + (.0609 - 1.104)^2}{6} \right) = 0.0298
\]

standard deviation = \( \sqrt{0.0298} \) = 0.1726 = 17.26%

**d.** Before the fact, for most assets the risk premium will be positive; investors demand compensation over and above the risk-free return to invest their money in the risky asset. After the fact, the observed risk premium can be negative if the asset’s nominal return is unexpectedly low, the risk-free return is unexpectedly high, or if some combination of these two events occurs.

#### 9.

**a.** Average return = \( \frac{0.06 - 10 + 0.4 + 23 + 12}{5} \) = 0.07 = 7%

**b.** Variance = \( \frac{1}{4} \left( \frac{0.06 - 0.07)^2 + (-10 - 0.07)^2 + (0.04 - 0.07)^2 + (0.23 - 0.07)^2 + (0.12 - 0.07)^2}{4} \right) = 0.0145
\]

standard deviation = \( \sqrt{0.0145} \) = 0.12042 = 12.04%

**10.**

\[
\bar{r} = (1.07/1.035) - 1 = 3.38%
\]

\[
\bar{R} = \bar{R} - \bar{R}_f = 0.07 - 0.038 = 3.20%
\]

\[
\bar{R}_f = (1.038/1.035) - 1 = 0.29% \quad ; \quad \bar{R}_p = \bar{R} - \bar{R}_f = 3.38 - 0.29 = 3.09%
\]

**11.** T-bill rates were highest in the early eighties. This was during a period of high inflation and is consistent with the Fisher effect.

**12.**

\[
P_t = $90(PVIFA_{10\%,6}) + $1,000(PVIF_{10\%,6}) = $956.45
\]

\[
R = \left[ \frac{90 + ($956.45 - $1,025.50))}{$1,025.50} \right] = 0.0204
\]

\[
r = \left[ \frac{(1 + .0204)/1.035}{1} \right] - 1 = -1.41%
\]
CHAPTER 12  371

14. $P(r < -3.8$ or $r > 14.6) \approx \frac{1}{6}$, but we are only interested in one tail here; $P(r < 4) \approx \frac{1}{6}$

95% level: $R \in \mu \pm 2\sigma = 5.4 \pm 2(9.2) = -13.0%$ to 23.8%
99% level: $R \in \mu \pm 3\sigma = 5.4 \pm 3(9.2) = -22.2%$ to 33.0%

15. $\mu = 17.7%; \sigma = 34.1%$. Doubling your money is a 100% return, so if the return distribution is normal, $z = (100 - 17.7)/(34.1) = 2.41$ standard deviations above the mean; this corresponds to a probability of \approx 1%, or once every 100 years. Tripling your money would be $z = (200 - 17.7)/(34.1) = 5.35$ standard deviations above the mean; this corresponds to a probability of (much) less than 0.5%, or once every 200 years. (The actual answer is \approx 0.0001%, or about once every 1 million years).

Intermediate

16. It is impossible to lose more than 100 percent of your investment. Therefore, return distributions are truncated on the lower tail at \textasciitilde -100 percent.

17. For problems 17 and 18, $Z$ values should be rounded to the nearest value appearing in the cumulative normal probability table.

$z = (0 - 12.7)/20.3 = -0.6256; \ P(\ R \leq 0) \approx 26.76%$

Challenge

18. a. $z_1 = (10 - 6)/8.7 = 0.4598; \ P(\ R \geq 10%) = 1 - \ P(\ R \leq 10%) = 1 - .6773 \approx 32.27%$

$z_2 = (0 - 6)/8.7 = -0.6897; \ P(\ R \leq 0) \approx 24.83%$

b. $z_3 = (10 - 3.8)/3.3 = 1.8788; \ P(\ R \geq 10%) = 1 - \ P(\ R \leq 10%) = 1 - .9699 \approx 3.01%$

$z_4 = (0 - 3.8)/3.3 = -1.1515 ; \ P(\ R \leq 0) \approx 12.30%$

c. $z_5 = (-4.18 - 6)/8.7 = -1.1701; \ P(\ R \leq -4.18%) \approx 11.90%$

$z_6 = (10.38 - 3.8)/3.3 = 1.9939; \ P(\ R \geq 10.38%) = 1 - \ P(\ R \leq 10.38%) = 1 - .9772 \approx 2.28%$