Chapter 10

Some Lessons from Capital Market History
Key Concepts and Skills

- Know how to calculate the return on an investment
- Understand the historical returns on various types of investments
- Understand the historical risks on various types of investments
Risk, Return and Financial Markets

• We can examine returns in the financial markets to help us determine the appropriate returns on non-financial assets

• Lesson from capital market history
  – There is a reward for bearing risk
  – The greater the potential reward, the greater the risk
  – This is called the risk-return trade-off
Dollar Returns

• Total dollar return = income from investment + capital gain (loss) due to change in price

• Example:
  – You bought a bond for $950 1 year ago. You have received two coupons of $30 each. You can sell the bond for $975 today. What is your total dollar return?
  • Income = 30 + 30 = 60
  • Capital gain = 975 – 950 = 25
  • Total dollar return = 60 + 25 = $85
Percentage Returns

- It is generally more intuitive to think in terms of percentages than dollar returns.
- Dividend yield = income / beginning price
- Capital gains yield = (ending price – beginning price) / beginning price
- Total percentage return = dividend yield + capital gains yield
Example – Calculating Returns

• You bought a stock for $35 and you received dividends of $1.25. The stock is now selling for $40.
  – What is your dollar return?
    • Dollar return = 1.25 + (40 – 35) = $6.25
  – What is your percentage return?
    • Dividend yield = 1.25 / 35 = 3.57%
    • Capital gains yield = (40 – 35) / 35 = 14.29%
    • Total percentage return = 3.57 + 14.29 = 17.86%
The Importance of Financial Markets

- Financial markets allow companies, governments and individuals to increase their utility
  - Savers have the ability to invest in financial assets so that they can defer consumption and earn a return to compensate them for doing so
  - Borrowers have better access to the capital that is available so that they can invest in productive assets
- Financial markets also provide us with information about the returns that are required for various levels of risk

<table>
<thead>
<tr>
<th>Period</th>
<th>% Decline in S&amp;P 500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct. 10, 1983 – July 24, 1984</td>
<td>-14.4%</td>
</tr>
<tr>
<td>Nov. 2, 1987 – Dec. 4, 1987</td>
<td>-12.4%</td>
</tr>
<tr>
<td>Oct. 9, 1989 – Jan. 30, 1990</td>
<td>-10.2%</td>
</tr>
<tr>
<td>July 16, 1990 – Oct. 11, 1990</td>
<td>-19.9%</td>
</tr>
<tr>
<td>Feb. 18, 1997 – Apr. 11, 1997</td>
<td>-9.6%</td>
</tr>
<tr>
<td>July 19, 1999 – Oct. 18, 1999</td>
<td>-12.1%</td>
</tr>
</tbody>
</table>
Figure 10.4

Index

$10,000

$10,000

$1,000

$1,000

$100

$100

$10

$10

$1

$1

$0.1

$0.1


Year-end

Small-company stocks

Large-company stocks

Long-term government bonds

Inflation

Treasury bills

$6,640.79

$2,845.63

$40.22

$15.64

$9.39
# Average Returns

<table>
<thead>
<tr>
<th>Investment</th>
<th>Average Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large stocks</td>
<td>13.3%</td>
</tr>
<tr>
<td>Small Stocks</td>
<td>17.6%</td>
</tr>
<tr>
<td>Long-term Corporate Bonds</td>
<td>5.9%</td>
</tr>
<tr>
<td>Long-term Government Bonds</td>
<td>5.5%</td>
</tr>
<tr>
<td>U.S. Treasury Bills</td>
<td>3.8%</td>
</tr>
<tr>
<td>Inflation</td>
<td>3.2%</td>
</tr>
</tbody>
</table>
Risk Premiums

- The “extra” return earned for taking on risk
- Treasury bills are considered to be risk-free
- The risk premium is the return over and above the risk-free rate
Historical Risk Premiums

- Large stocks: $13.3 - 3.8 = 9.5\%$
- Small stocks: $17.6 - 3.8 = 13.8\%$
- Long-term corporate bonds: $5.9 - 3.8 = 2.1\%$
- Long-term government bonds: $5.5 - 3.8 = 1.7\%$
Figure 10.9
Variance and Standard Deviation

- Variance and standard deviation measure the volatility of asset returns.
- The greater the volatility the greater the uncertainty.
- Historical variance = sum of squared deviations from the mean / (number of observations − 1).
- Standard deviation = square root of the variance.
Example – Variance and Standard Deviation

<table>
<thead>
<tr>
<th>Year</th>
<th>Actual Return</th>
<th>Average Return</th>
<th>Deviation from the Mean</th>
<th>Squared Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.15</td>
<td>.105</td>
<td>.045</td>
<td>.002025</td>
</tr>
<tr>
<td>2</td>
<td>.09</td>
<td>.105</td>
<td>-.015</td>
<td>.000225</td>
</tr>
<tr>
<td>3</td>
<td>.06</td>
<td>.105</td>
<td>-.045</td>
<td>.002025</td>
</tr>
<tr>
<td>4</td>
<td>.12</td>
<td>.105</td>
<td>.015</td>
<td>.000225</td>
</tr>
<tr>
<td>Totals</td>
<td>.42</td>
<td>.105</td>
<td>.00</td>
<td>.0045</td>
</tr>
</tbody>
</table>

Variance = .0045 / (4-1) = .0015    Standard Deviation = .03873
**Figure 10.10**

<table>
<thead>
<tr>
<th>Series</th>
<th>Average Return</th>
<th>Standard Deviation</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large-company stocks</td>
<td>13.3%</td>
<td>20.1</td>
<td></td>
</tr>
<tr>
<td>Small-company stocks</td>
<td>17.6</td>
<td>33.6</td>
<td>*</td>
</tr>
<tr>
<td>Long-term corporate bonds</td>
<td>5.9</td>
<td>8.7</td>
<td></td>
</tr>
<tr>
<td>Long-term government</td>
<td>5.5</td>
<td>9.3</td>
<td></td>
</tr>
<tr>
<td>Intermediate-term government</td>
<td>5.4</td>
<td>5.8</td>
<td></td>
</tr>
<tr>
<td>U.S. Treasury bills</td>
<td>3.8</td>
<td>3.2</td>
<td></td>
</tr>
<tr>
<td>Inflation</td>
<td>3.2</td>
<td>4.5</td>
<td></td>
</tr>
</tbody>
</table>

*The 1933 small-company stock total return was 142.9 percent.*
Figure 10.11

Probability

-3F  -2F  -1F  0  +1F  +2F  +3F
-47.0% -26.9% -6.8% 13.3% 33.4% 53.5% 73.6%

Return on large common stocks
Efficient Capital Markets

- Stock prices are in equilibrium or are “fairly” priced
- If this is true, then you should not be able to earn “abnormal” or “excess” returns
- Efficient markets *DO NOT* imply that investors cannot earn a positive return in the stock market
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Efficient market reaction: the price instantaneously adjusts to and fully reflects new information; there is no tendency for subsequent increases and decreases.

Delayed reaction: The price partially adjusts to the new information; eight days elapse before the price completely reflects the new information.

Overreaction and correction: The price over adjusts to the new information; it overshoots the new price and subsequently corrects.

Days relative to announcement day (Day 0)
What Makes Markets Efficient?

• There are many investors out there doing research
  – As new information comes to market, this information is analyzed and trades are made based on this information
  – Therefore, prices should reflect all available public information

• If investors stop researching stocks, then the market will not be efficient
Common Misconceptions about EMH

• Efficient markets do not mean that you can’t make money

• They do mean that, on average, you will earn a return that is appropriate for the risk undertaken and there is not a bias in prices that can be exploited to earn excess returns

• Market efficiency will not protect you from wrong choices if you do not diversify – you still don’t want to put all your eggs in one basket
Strong Form Efficiency

• Prices reflect all information, including public and private.

• If the market is strong form efficient, then investors could not earn abnormal returns regardless of the information they possessed.

• Empirical evidence indicates that markets are NOT strong form efficient and that insiders could earn abnormal returns.
Semistrong Form Efficiency

- Prices reflect all publicly available information including trading information, annual reports, press releases, etc.
- If the market is semistrong form efficient, then investors cannot earn abnormal returns by trading on public information.
- Implies that fundamental analysis will not lead to abnormal returns.
Weak Form Efficiency

- Prices reflect all past market information such as price and volume.
- If the market is weak form efficient, then investors cannot earn abnormal returns by trading on market information.
- Implies that technical analysis will not lead to abnormal returns.
- Empirical evidence indicates that markets are generally weak form efficient.