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
- Understand the implications of market efficiency

Chapter Outline

- Returns
- The Historical Record
- Average Returns: The First Lesson
- The Variability of Returns: The Second Lesson
- More about Average Returns
- Capital Market Efficiency

Risk, Return and Financial Markets

- We can examine returns in the financial markets to help us determine the appropriate returns on non-financial assets
- Lessons 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 one 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 percentage, rather 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

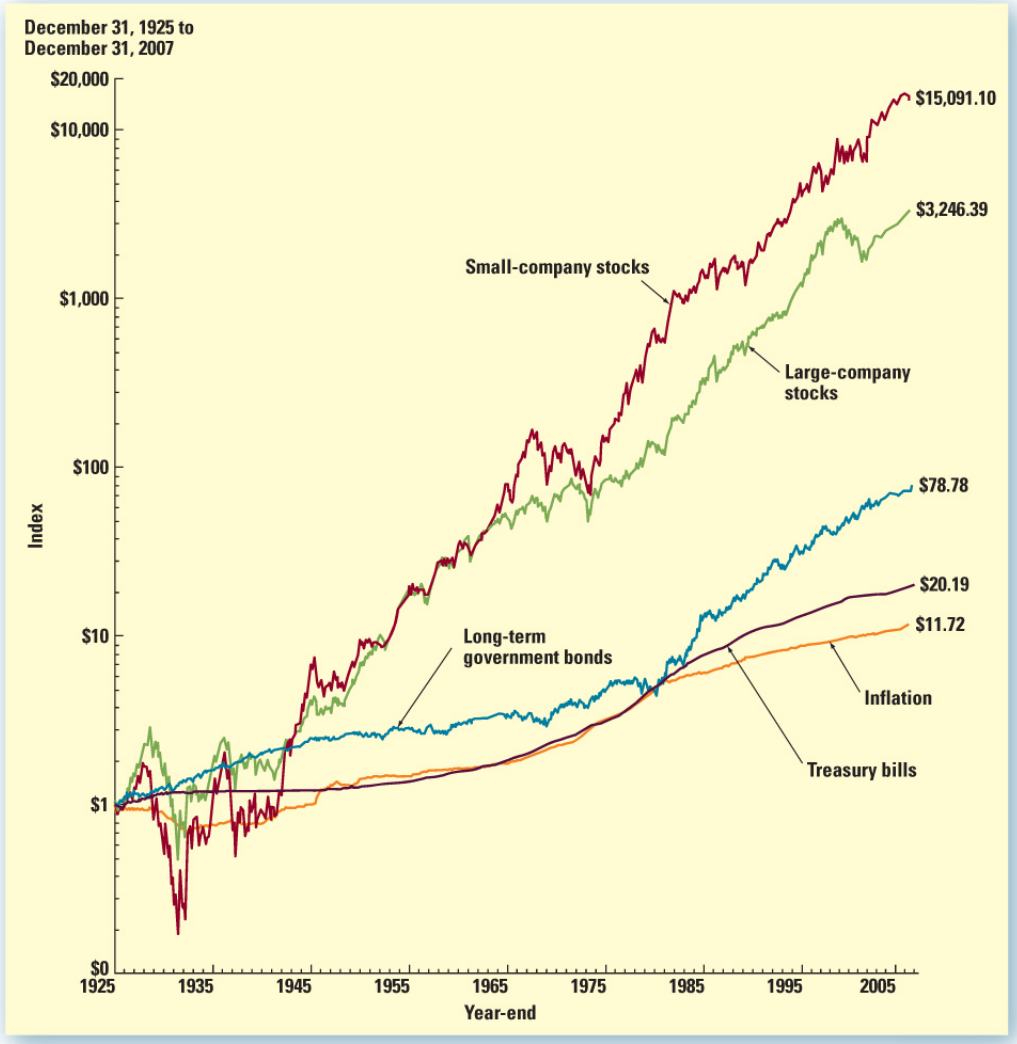
- You bought a stock for $35, and you received dividends of $1.25. The stock is now selling for $40.
  - What is your dollar return?
    - Dollar return = 1.25 + (40 – 35) = $6.25
  - What is your percentage return?
    - Dividend yield = 1.25 / 35 = 3.57%
    - Capital gains yield = (40 – 35) / 35 =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

Figure 12.4

FIGURE 12.4 A $1 Investment in Different Types of Portfolios: 1925–2007 (Year-End 1925 = $1)



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Year-to-Year Total Returns

Large-Company Stock Returns

Large Companies

Long-Term Government Bond Returns

Long-Term Government Bonds

U.S. Treasury Bill Returns

U.S. Treasury Bills

Average Returns

Investment	Average Return
Large Stocks	12.3%
Small Stocks	17.1%
Long-term Corporate Bonds	6.2%
Long-term Government Bonds	5.8%
U.S. Treasury Bills	3.8%
Inflation	3.1%

Risk Premiums

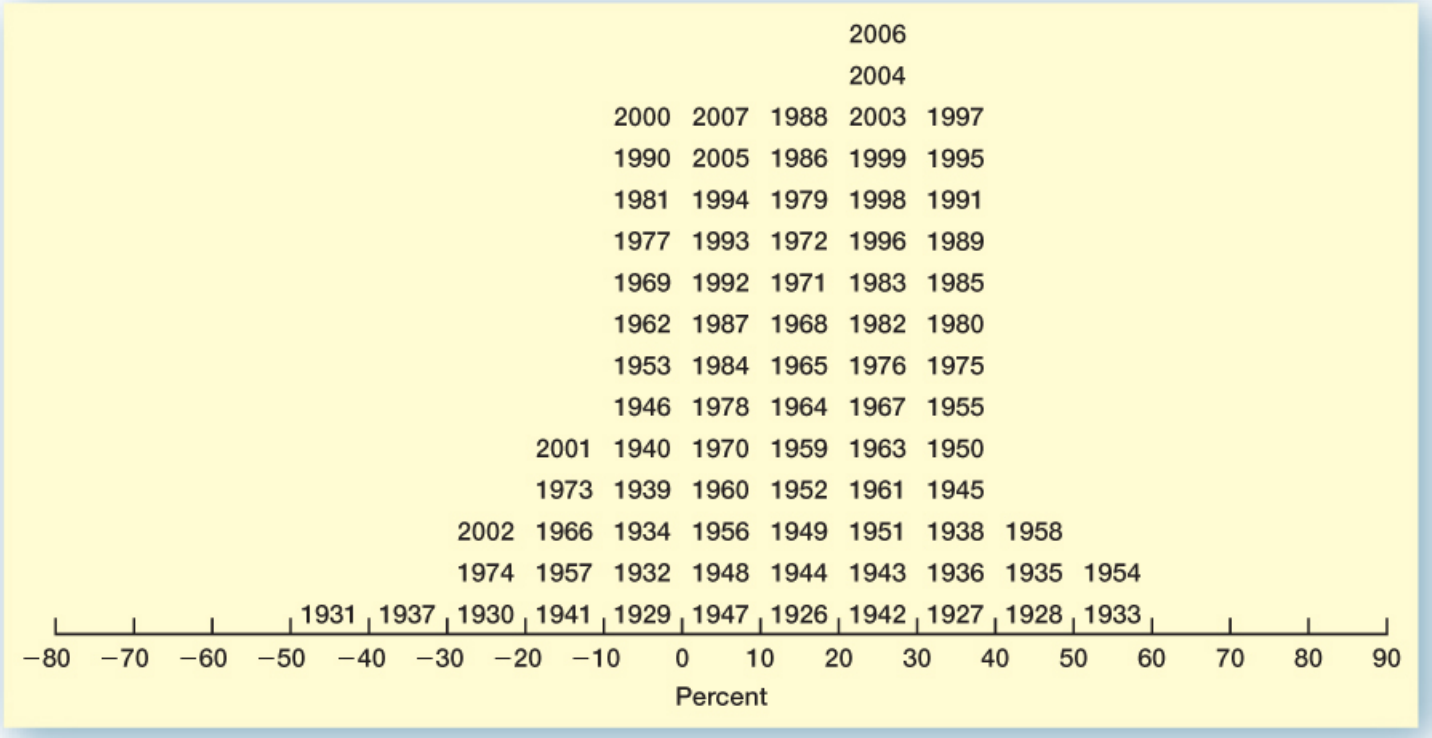
- The “extra” return earned for taking on risk
- Treasury bills are considered to be risk-free
- The risk premium is the return over and above the risk-free rate

Table 12.3 Average Annual Returns and Risk Premiums

Investment	Average Return	Risk Premium
Large Stocks	12.3%	8.5%
Small Stocks	17.1%	13.3%
Long-term Corporate Bonds	6.2%	2.4%
Long-term Government Bonds	5.8%	2.0%
U.S. Treasury Bills	3.8%	0.0%

Figure 12.9

FIGURE 12.9 Frequency Distribution of Returns on Large-Company Stocks: 1926–2007



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

Year	Actual Return	Average Return	Deviation from the Mean	Squared Deviation
1	.15	.105	.045	.002025
2	.09	.105	-.015	.000225
3	.06	.105	-.045	.002025
4	.12	.105	.015	.000225
Totals	.42		.00	.0045

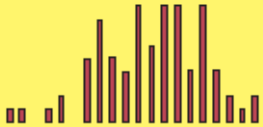
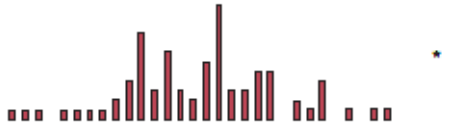
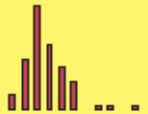
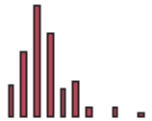
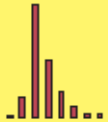
Variance = .0045 / (4-1) = .0015 Standard Deviation = .03873

Work the Web Example

- How volatile are mutual funds?
- Fundsupermart provides information on mutual funds, including volatility
- Click on the web surfer to go to the Fundsupermart site
  - Pick a fund, such as the LionGlobal Vietnam fund
  - Select from “Funds Search/Choose a fund” at the top
  - Click the performance button
  - What is the 3 year annualized volatility?

Figure 12.10

FIGURE 12.10 Historical Returns, Standard Deviations, and Frequency Distributions: 1926–2007

SERIES	AVERAGE RETURN	STANDARD DEVIATION	DISTRIBUTION
Large-company stocks	12.3%	20.0%	
Small-company stocks	17.1	32.6	
Long-term corporate bonds	6.2	8.4	
Long-term government bonds	5.8	9.2	
Intermediate-term government bonds	5.5	5.7	
U.S. Treasury bills	3.8	3.1	
Inflation	3.1	4.2	

*The 1933 small-company stocks total return was 142.9 percent.

SOURCE: Modified from *Stocks, Bonds, Bills, and Inflation: 2008 Yearbook™*, annually updates work by Roger G. Ibbotson and Rex A. Sinquefield (Chicago: Morningstar). All rights reserved.

Figure 12.11

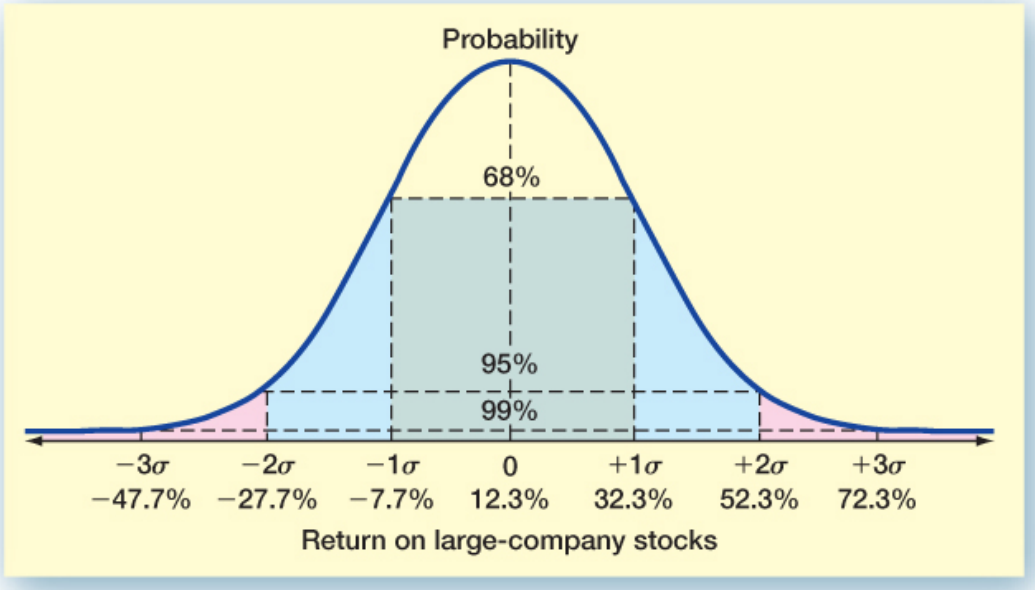


FIGURE 12.11

The Normal Distribution

NOTE: Illustrated returns are based on the historical return and standard deviation for a portfolio of large-firm common stocks.

Arithmetic vs. Geometric Mean

- Arithmetic average – return earned in an average period over multiple periods
- Geometric average – average compound return per period over multiple periods
- The geometric average will be less than the arithmetic average unless all the returns are equal
- Which is better?
  - The arithmetic average is overly optimistic for long horizons
  - The geometric average is overly pessimistic for short horizons
  - So, the answer depends on the planning period under consideration
    - 15 – 20 years or less: use the arithmetic
    - 20 – 40 years or so: split the difference between them
    - 40 + years: use the geometric

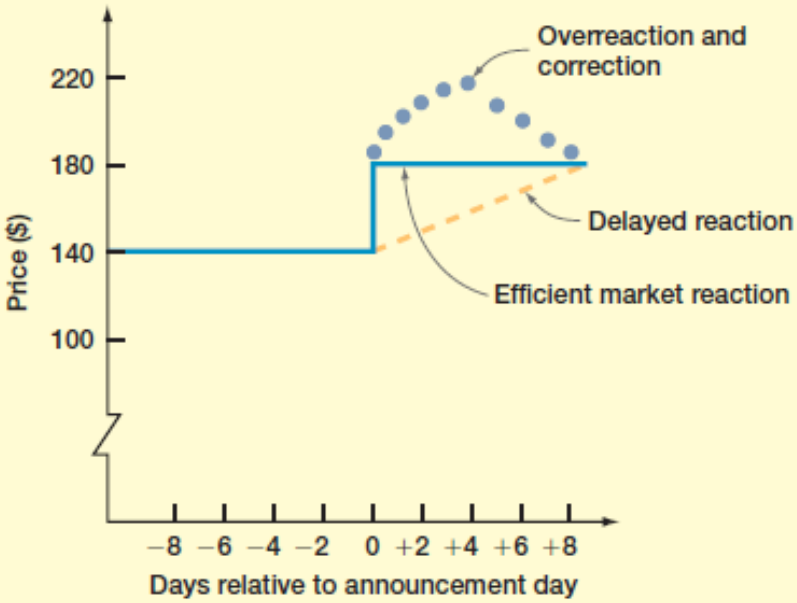
Example: Computing Averages

- What is the arithmetic and geometric average for the following returns?
  - Year 1 5%
  - Year 2 -3%
  - Year 3 12%
  - Arithmetic average = (5 + (–3) + 12)/3 = 4.67%
  - Geometric average = $[(1+.05)*(1-.03)*(1+.12)]^{1/3} – 1 = .0449 = 4.49\%$

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

Figure 12.13



Efficient market reaction: The price instantaneously adjusts to and fully reflects new information; there is no tendency for subsequent increases and decreases to occur.
Delayed reaction: The price partially adjusts to the new information; eight days elapse before the price completely reflects the new information.
Overreaction: The price overadjusts to the new information; it overshoots the new price and subsequently corrects.

FIGURE 12.13

Reaction of Stock Price to New Information in Efficient and Inefficient Markets

What Makes Markets Efficient?

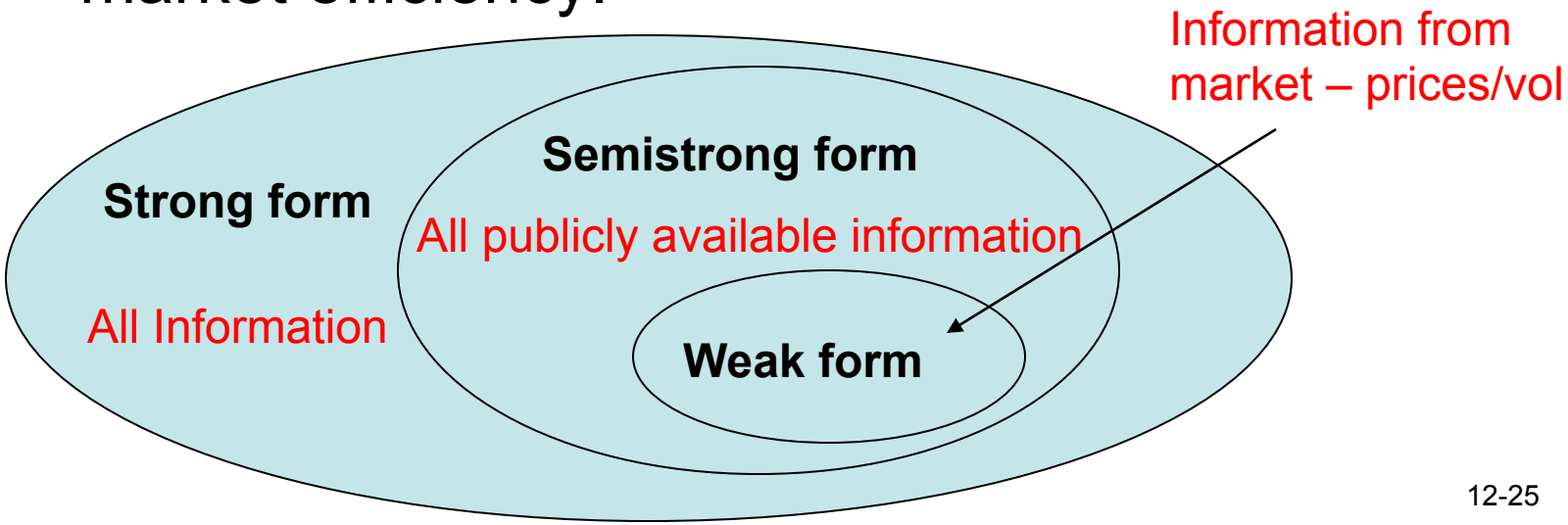
- There are many investors out there doing research
  - As new information comes to market, this information is analyzed and trades are made based on this information
  - Therefore, prices should reflect all available public information
- If investors stop researching stocks, then the market will not 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"

3 Forms of Market Efficiency

- Market efficiency is about whether information gets incorporated in the price.
- Eugene Fama suggests that information can be organized into 3 categories.
- Each category relates to a particular form of market efficiency.



Strong Form Efficiency

- Prices reflect all information, including public and private (insider information)
- 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

Quick Quiz

- Which of the investments discussed have had the highest average return and risk premium?
- Which of the investments discussed have had the highest standard deviation?
- What is capital market efficiency?
- What are the three forms of market efficiency?

Ethics Issues

- Program trading is defined as automated trading generated by computer algorithms designed to react rapidly to changes in market prices. Is it ethical for investment banking houses to operate such systems when they may generate trade activity ahead of their brokerage customers, to which they owe a fiduciary duty?
- Suppose that you are an employee of a printing firm that was hired to proofread proxies that contained unannounced tender offers (and unnamed targets). Should you trade on this information, and would it be considered illegal?

Comprehensive Problem

- Your stock investments return 8%, 12%, and -4% in consecutive years. What is the geometric return?
- What is the sample standard deviation of the above returns?
- Using the standard deviation and mean that you just calculated, and assuming a normal probability distribution, what is the probability of losing 3% or more?

End of Chapter