CHAPTER 12

Behavioral Finance and Technical Analysis

Behavioral Finance

Conventional Finance

- Prices are correct; equal to intrinsic value.
- Resources are allocated efficiently.
- Consistent with EMH

Behavioral Finance

- What if investors don't behave rationally?

The Behavioral Critique

Two categories of irrationalities:

1. Investors do not always process information *correctly* and/or *timely*.

   Result: Incorrect probability distributions of future returns.

2. Even when given a probability distribution of returns, investors may make inconsistent or suboptimal decisions.

   Result: They have behavioral biases.

Errors in Information Processing: Misestimating True Probabilities

1. Forecasting Errors: Too much weight is placed on recent experiences.

2. Overconfidence: Investors overestimate their abilities and the precision of their forecasts.

3. Conservatism: Investors are slow to update their beliefs and under react to new information.

4. Sample Size Neglect and Representativeness: Investors are too quick to infer a pattern or trend from a small sample.

Behavioral Biases

- Biases result in less than rational decisions, even with perfect information.

Examples:

1. Framing (the half glass problem):
   - How the risk is described, “risky losses” vs. “risky gains”, can affect investor decisions.

Behavioral Biases

2. Mental Accounting:
   - Investors may segregate accounts or monies and take risks with their gains that they would not take with their principal
3. Regret Avoidance:
   - Investors blame themselves more when an unconventional or risky bet turns out badly

Behavioral Biases

4. Prospect Theory:
   - Conventional view: Utility depends on level of wealth.
   - Behavioral view: Utility depends on changes in current wealth.

Figure 12.1 Prospect Theory

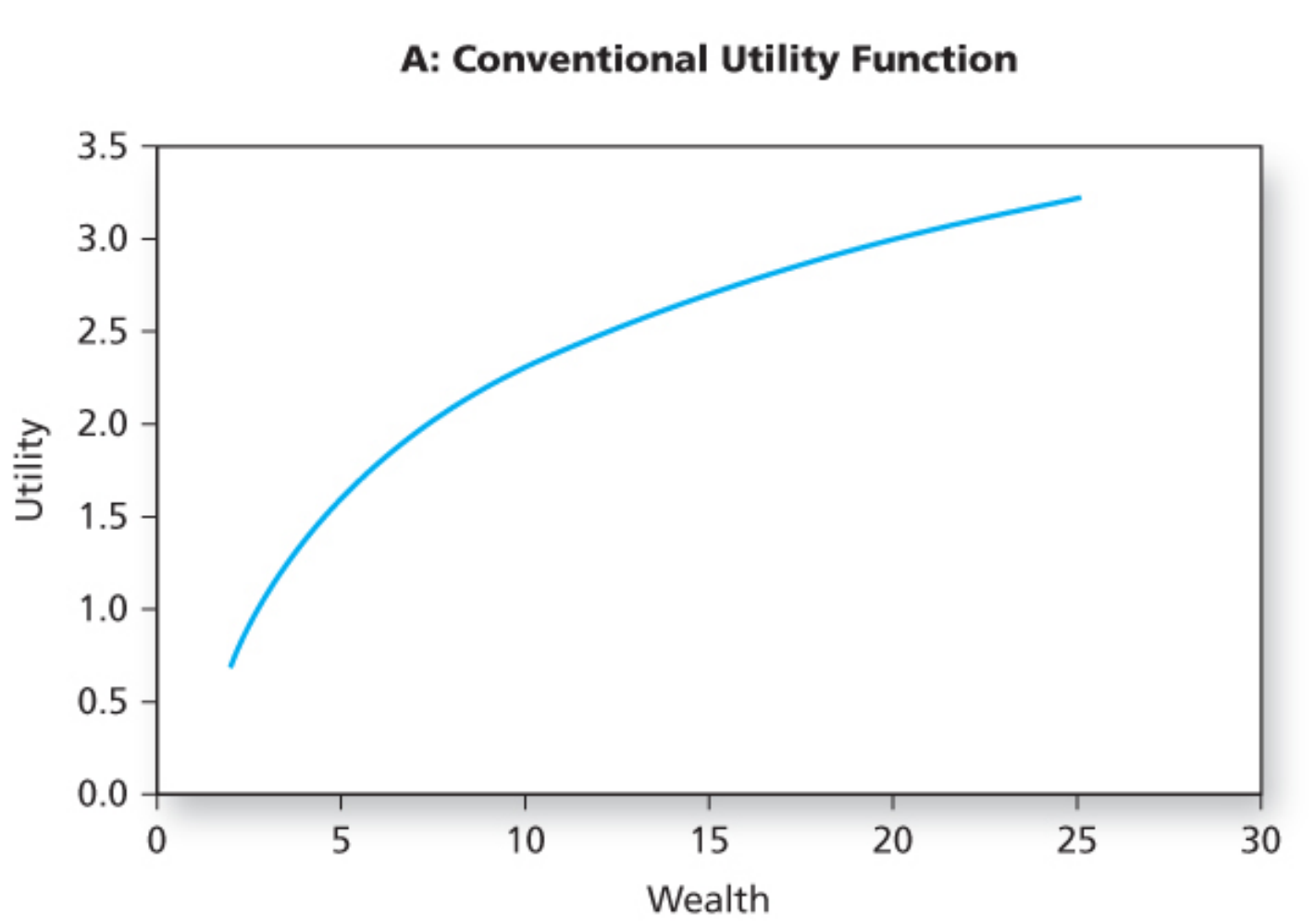
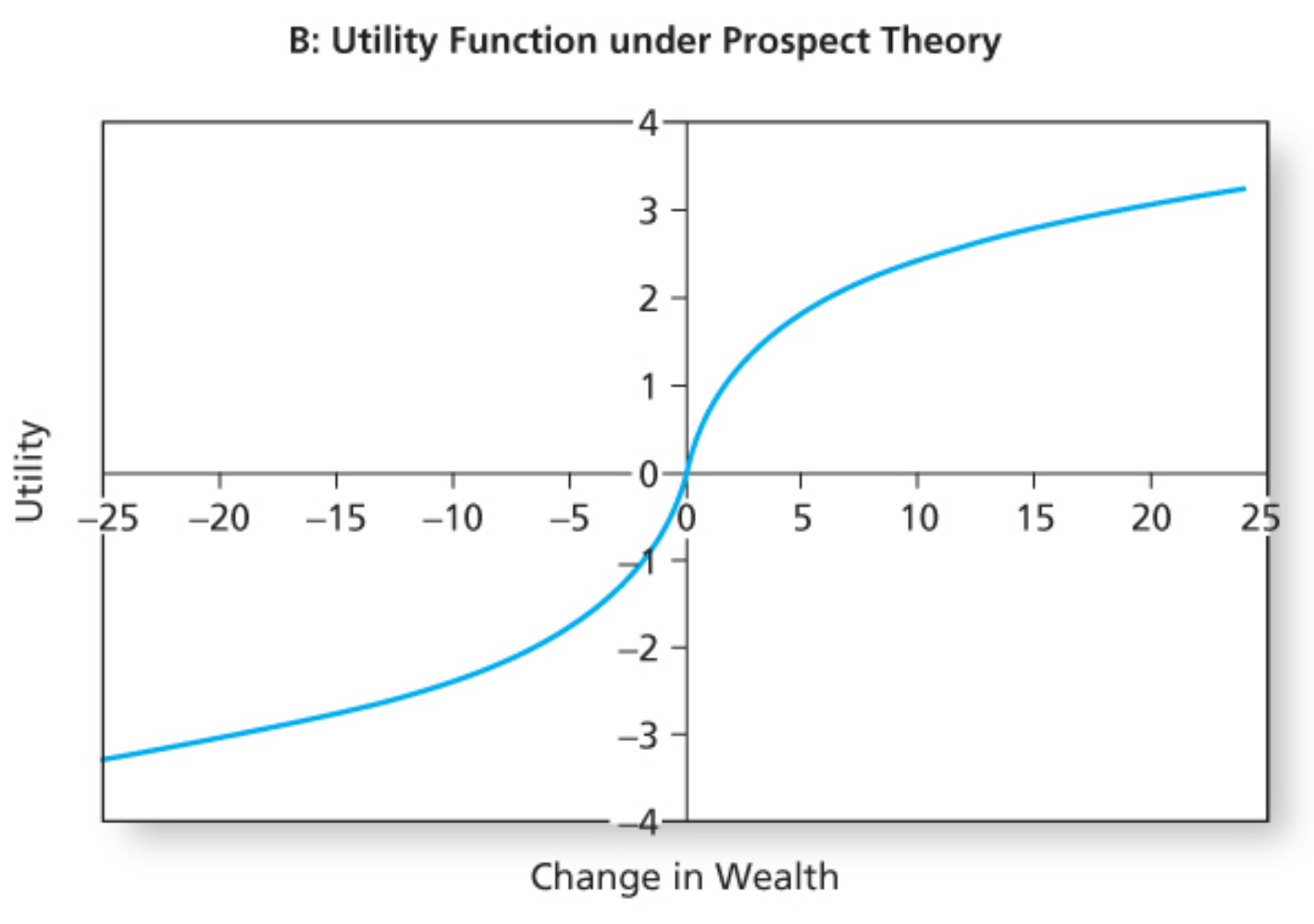


Figure 12.1 Prospect Theory



Limits to Arbitrage

- Behavioral biases would not matter if rational arbitrageurs could fully exploit the mistakes of behavioral investors.

- Fundamental Risk:
  - "Markets can remain irrational longer than you can remain solvent."
  - Intrinsic value and market value may take too long to converge.

Limits to Arbitrage

- Implementation Costs:
  - Transactions costs and restrictions on short selling can limit arbitrage activity.
- Model Risk:
  - What if you have a bad model and the market value is actually correct?
  - What if *you* have the right model and everyone else has the wrong one?

Limits to Arbitrage and the Law of One Price

- Siamese Twin Companies
  - Royal Dutch should sell for 1.5 times Shell
  - Actual price ratio deviated from parity ratio for extended periods
  - Example of fundamental risk

Figure 12.2 Pricing of Royal Dutch Relative to Shell (Deviation from Parity)

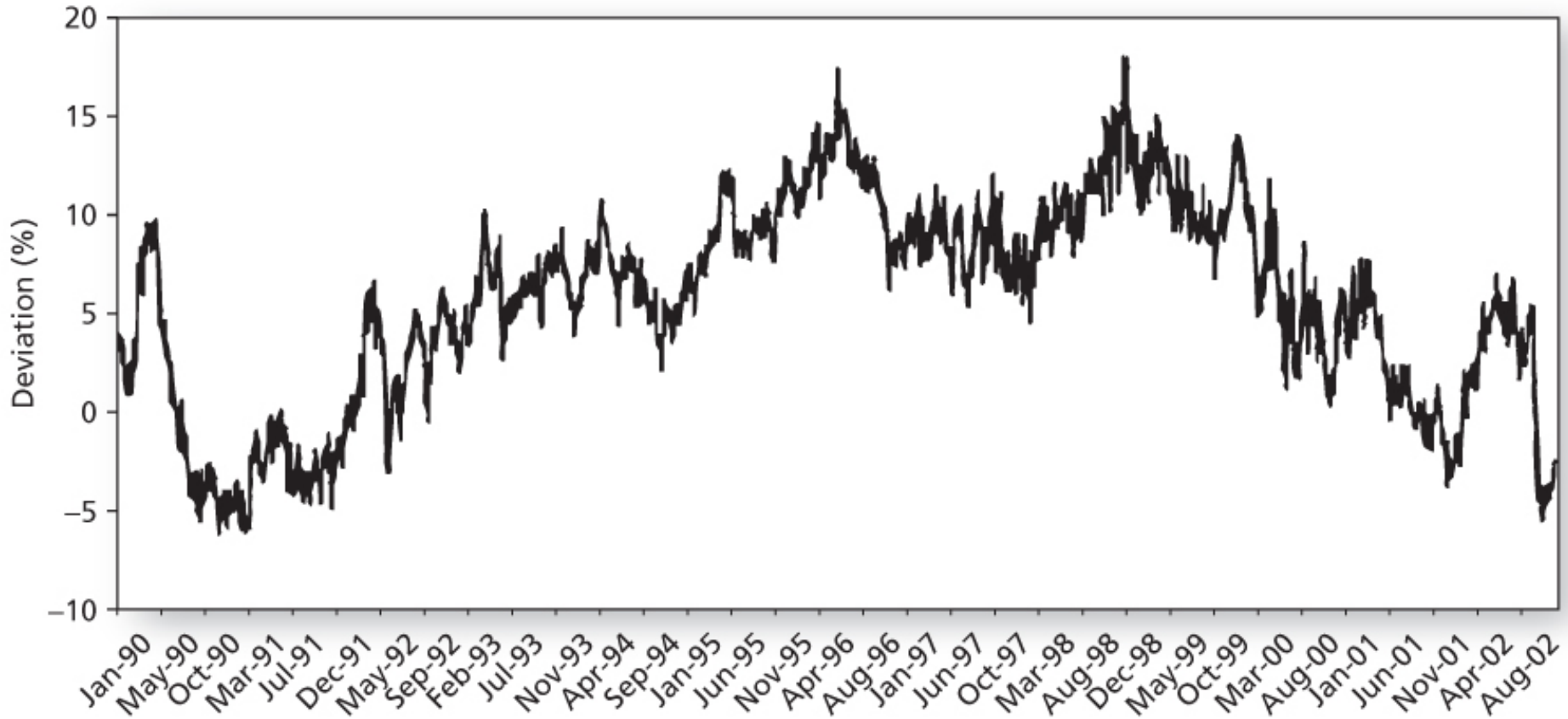


Figure 12.2 Pricing of Royal Dutch relative to Shell (*deviation from parity*)

Source: O. A. Lamont and R. H. Thaler, "Anomalies: The Law of One Price in Financial Markets," *Journal of Economic Perspectives* 17 (Fall 2003), pp. 191–202.

Limits to Arbitrage and the Law of One Price

- Equity Carve-outs
  - 3Com and Palm: 5% of Palm in IPO; 3Com shareholder: 95%, plus 1.5 shares in 6m
  - Structure implied 3Com to be negative, although Asset/Share = $10
  - Arbitrage was limited by non availability of Palm shares for shorting
- Closed-End Funds
  - May sell at premium or discount to NAV
  - Can also be explained by rational return expectations, idiosyncratic nature, sentiment

Bubbles and Behavioral Economics

Bubbles are easier to spot after they end:

- Dot-com bubble
- Housing bubble
- Which one is next?

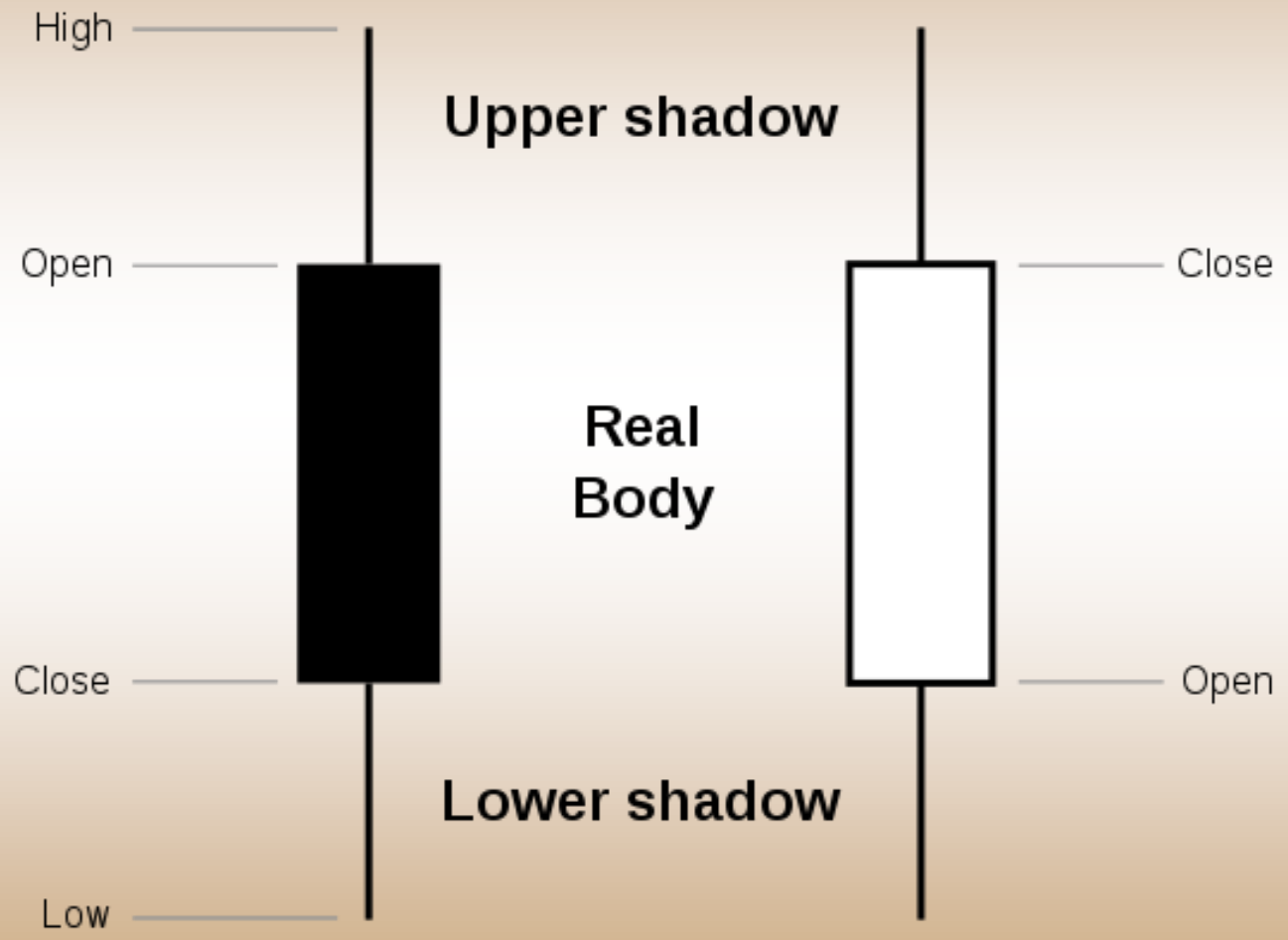
Bubbles and Behavioral Economics

- Rational explanation for stock market bubble using the dividend discount model:

$$PV_0 = \frac{D_1}{k - g}$$

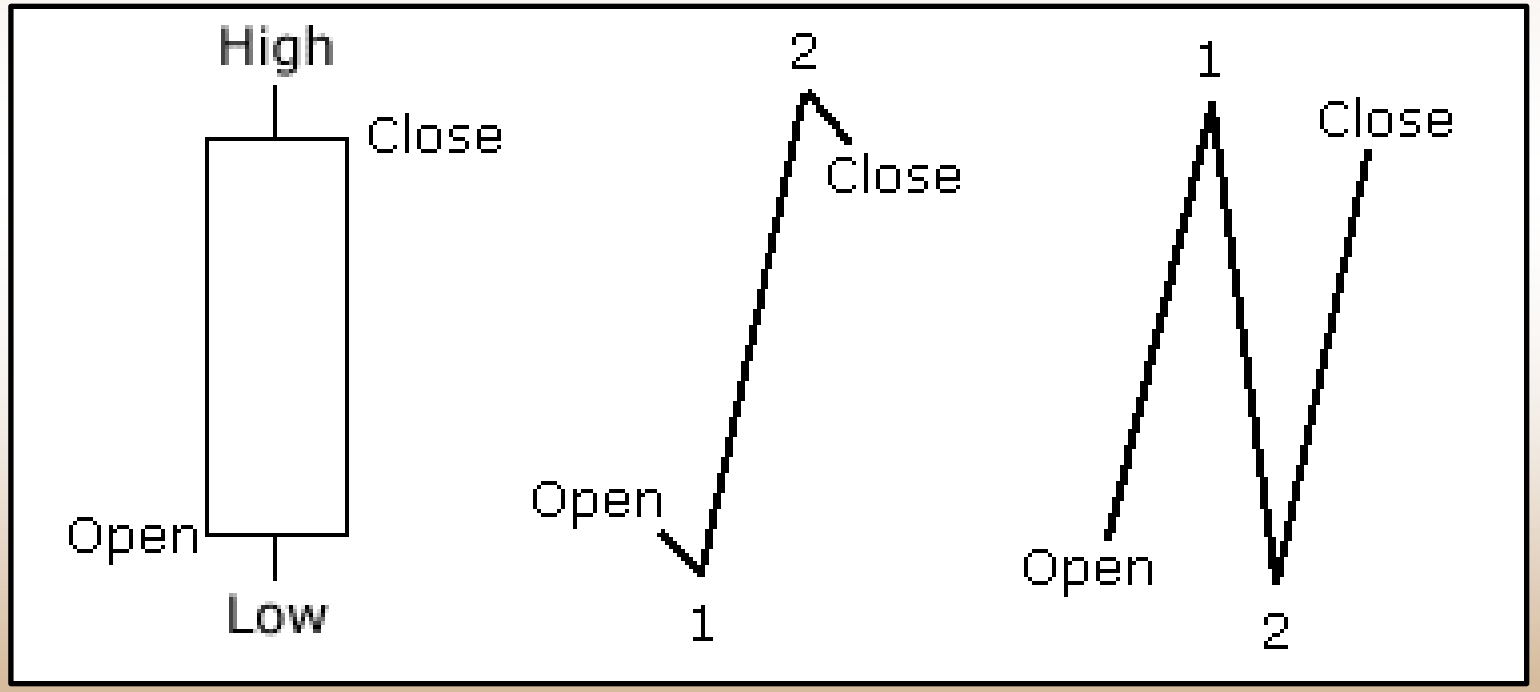
- S&P 500 is worth $12,883 million if dividend growth rate is 8% (close to actual value in 2000).
- S&P 500 is worth $8,589 million if dividend growth rate is 7.4% (close to actual value in 2002).

Candlestick Chart – definitions



Candlestick – Hi-Lo Sequence

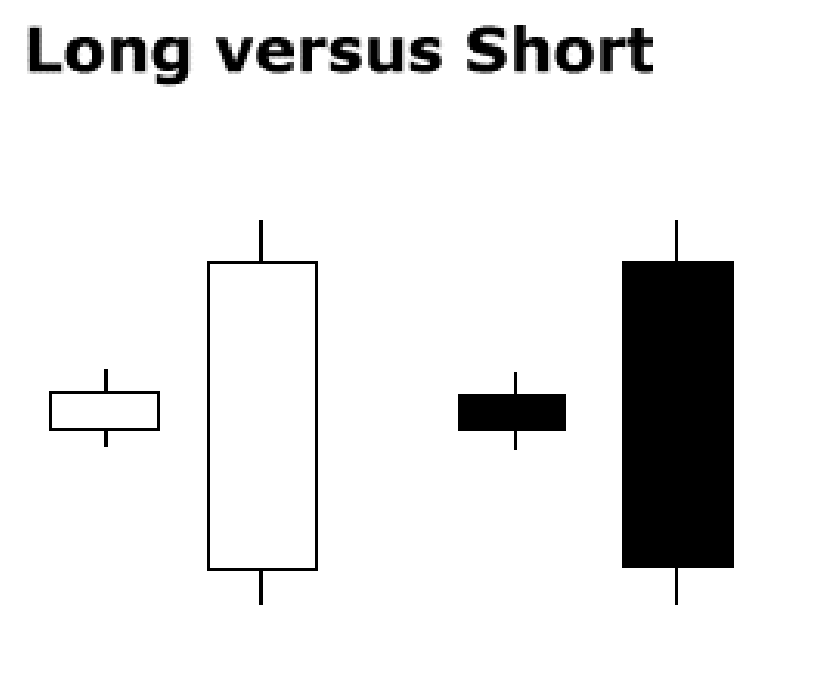
Candlestick does not tell sequence

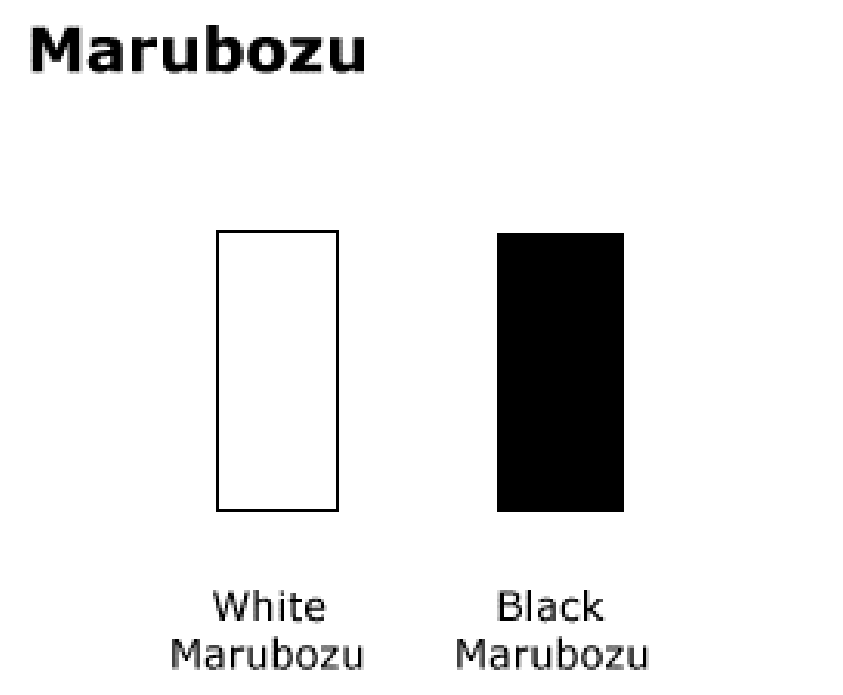


Candlestick Charts: Types

Trend vs Consolidation

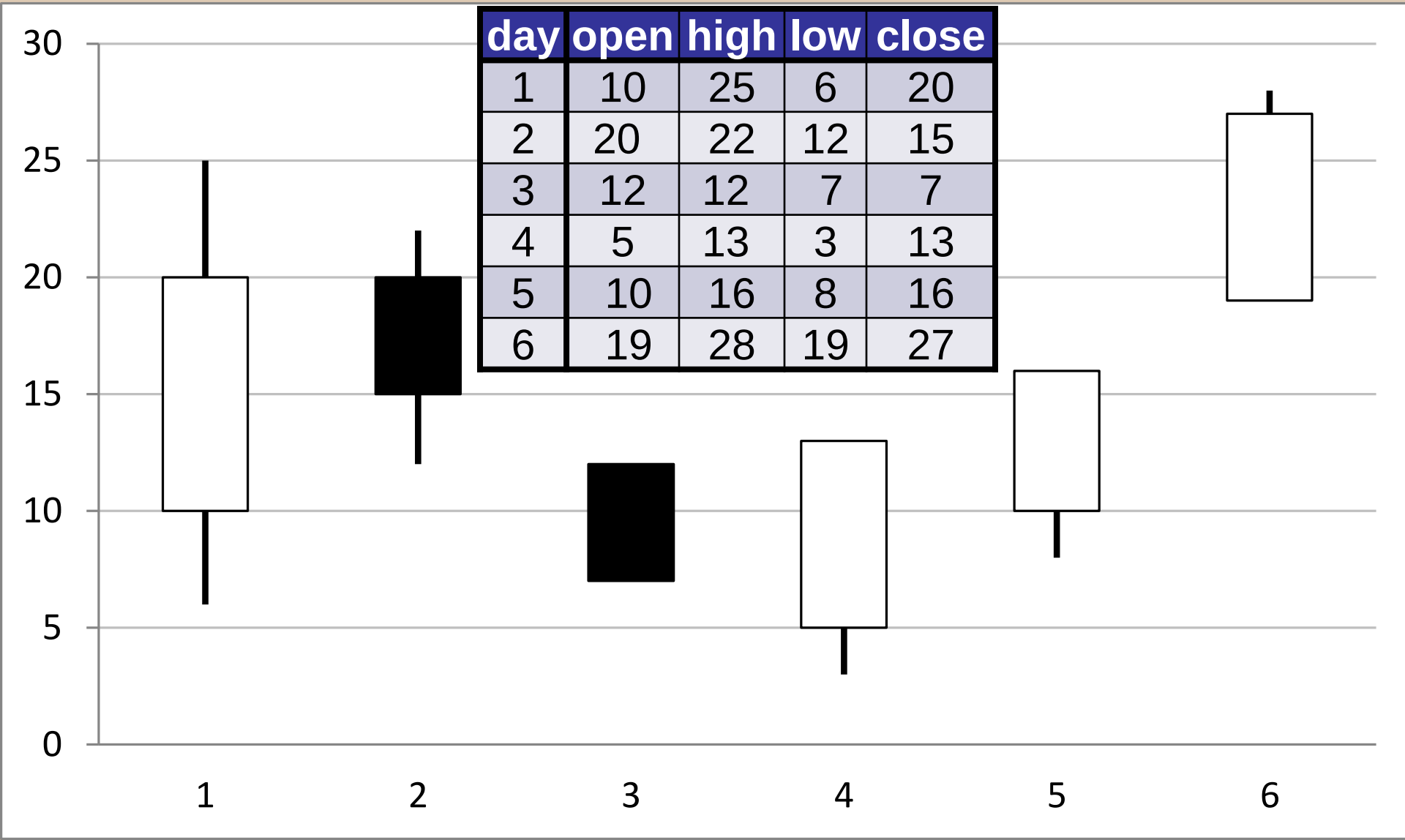
Marubozu = one way action





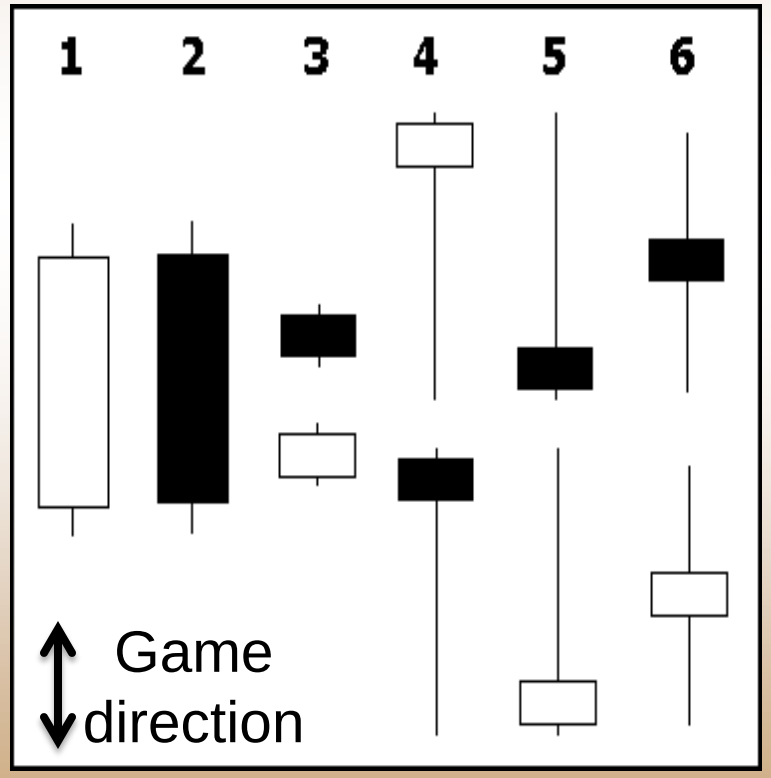
Candlestick Analysis - Example

day	open	high	low	close
1	10	25	6	20
2	20	22	12	15
3	12	12	7	7
4	5	13	3	13
5	10	16	8	16
6	19	28	19	27



A Football Analogy

Bulls	Bears
White jersey	Black jersey
Attack up	Attack down



1. Bulls controlled most of the game
2. Bears controlled most of the game
3. Neither team could move the ball
4. Bears controlled the ball for part of the game, but lost control at the end of the game, and the Bulls made an impressive comeback
5. Bulls controlled part of the game, but Bears made an impressive comeback
6. Both the Bears and the Bulls had their moments during the game, but neither could put the other away, resulting in a standoff

Technical Analysis and Behavioral Finance

- Technical analysis attempts to exploit recurring and predictable patterns in stock prices
  - Prices adjust gradually to a new equilibrium
  - Market values and intrinsic values converge slowly

Technical Analysis and Behavioral Finance

- Disposition effect: The tendency of investors to *hold on* to losing investments.
  - Demand for shares depends on price history
  - Can lead to momentum in stock prices

Trends and Corrections: The Search for Momentum

Dow Theory

1. Primary trend : Long-term movement of prices, lasting from several months to several years.
2. Secondary or intermediate trend: short-term deviations of prices from the underlying trend line and are eliminated by corrections.
3. Tertiary or minor trends: Daily fluctuations of little importance.

Figure 12.3 Dow Theory Trends

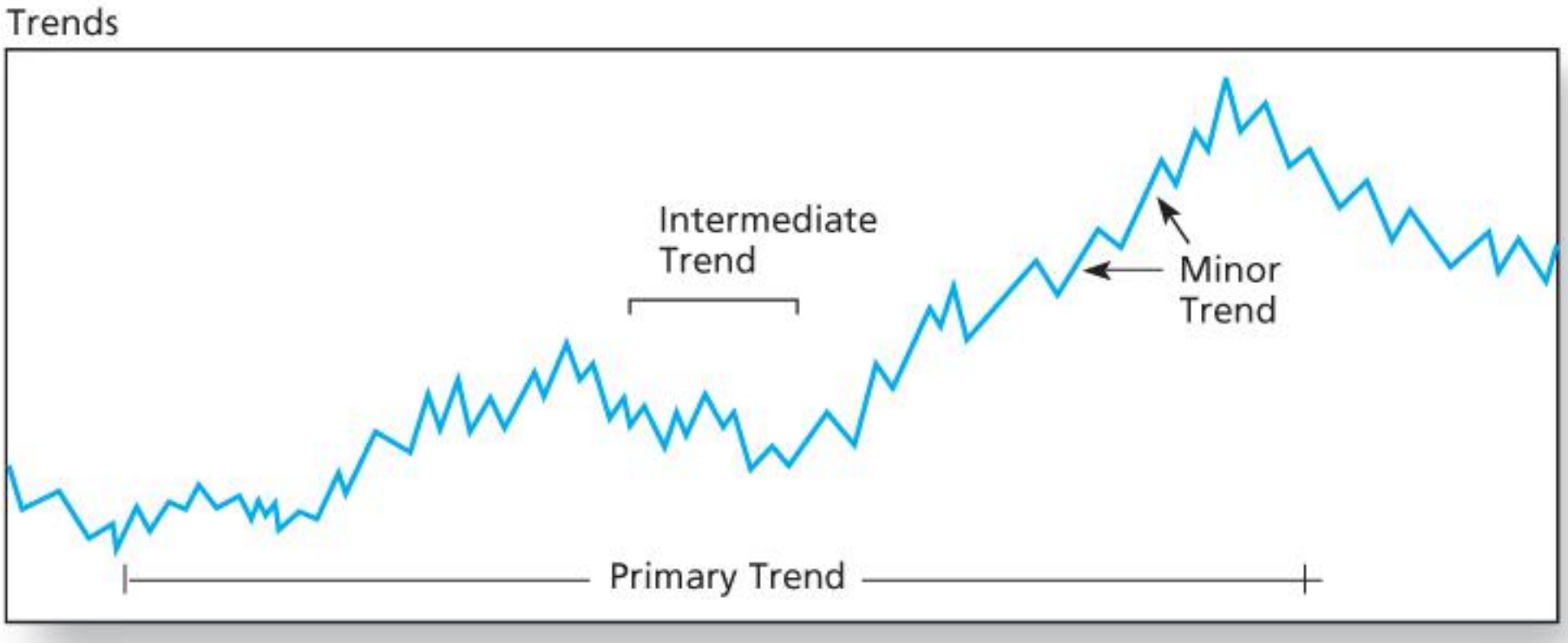


Figure 12.3 Dow theory trends

Trends and Corrections: Moving Averages

- The moving average is the average level of prices over a given interval of time.
- Bullish signal: Market price breaks through the moving average line from below. Time to buy
- Bearish signal: When prices fall below the moving average, it is time to sell.

Figure 12.5 Moving Average for HPQ

Figure 12.5 Moving average for Hewlett-Packard (HPQ)

Trends and Corrections: Breadth

Breadth: Often measured as the spread between the number of stocks that advance and decline in price.

Example: for NYSE Breadth=

1604-1434= 170

Trading Diary: Volume, Advancers, Decliners

Markets Diary — 4.02 p.m. EST 11/02/09

Issues	NYSE	Nasdaq	Amex
Advancing	1,604	1,277	234
Declining	1,434	1,414	223
unchanged	97	108	67
Total	3,135	2,799	524
Issues at			
New 52 Week High	28	25	4
New 52 Week Low	14	65	10
Share Volume			
Total	1,504,894,769	2,397,479,912	18,612,688
Advancing	795,587,220	1,226,163,683	9,216,888
Declining	681,280,499	1,121,231,398	7,688,900
Unchanged	28,027,050	50,084,831	1,706,900

Sentiment Indicators: Trin Statistic

- TRIN (**TR**aders **IN**dex) (aka Arms) Statistic:

$$TRIN = \frac{\text{volume declining} \,/\, \#\text{ stocks declining}}{\text{volume advancing} \,/\, \#\text{ stocks advancing}}$$

Ratios above 1.0 are bearish

Sentiment Indicators: Confidence Index

- **Confidence index**:

$$\text{Confidence Index} = \frac{\text{Avg Yield of 10 Top Rated Corporate Bonds}}{\text{Avg Yield of 10 intermediate grade Corporate Bonds}}$$

- Higher values are bullish.

Sentiment Indicators: Put/Call Ratio

- Puts are the right to sell
  - A way to bet on falling prices
- Calls are the right to buy
  - A way to bet on rising prices
- A rising ratio may signal investor pessimism and a coming market decline.
- Contrarian investors see a rising ratio as a buying opportunity!

Warning!

- It is possible to perceive patterns that really don't exist.
- Figure 12.8A is based on the real data. The graph in panel B was generated using "returns" created by a random-number generator.
- Figure 12.9 shows obvious randomness in the weekly price changes behind the two panels in Figure 12.8

Figure 12.8 Actual and Simulated Levels for Stock Market Prices of 52 Weeks

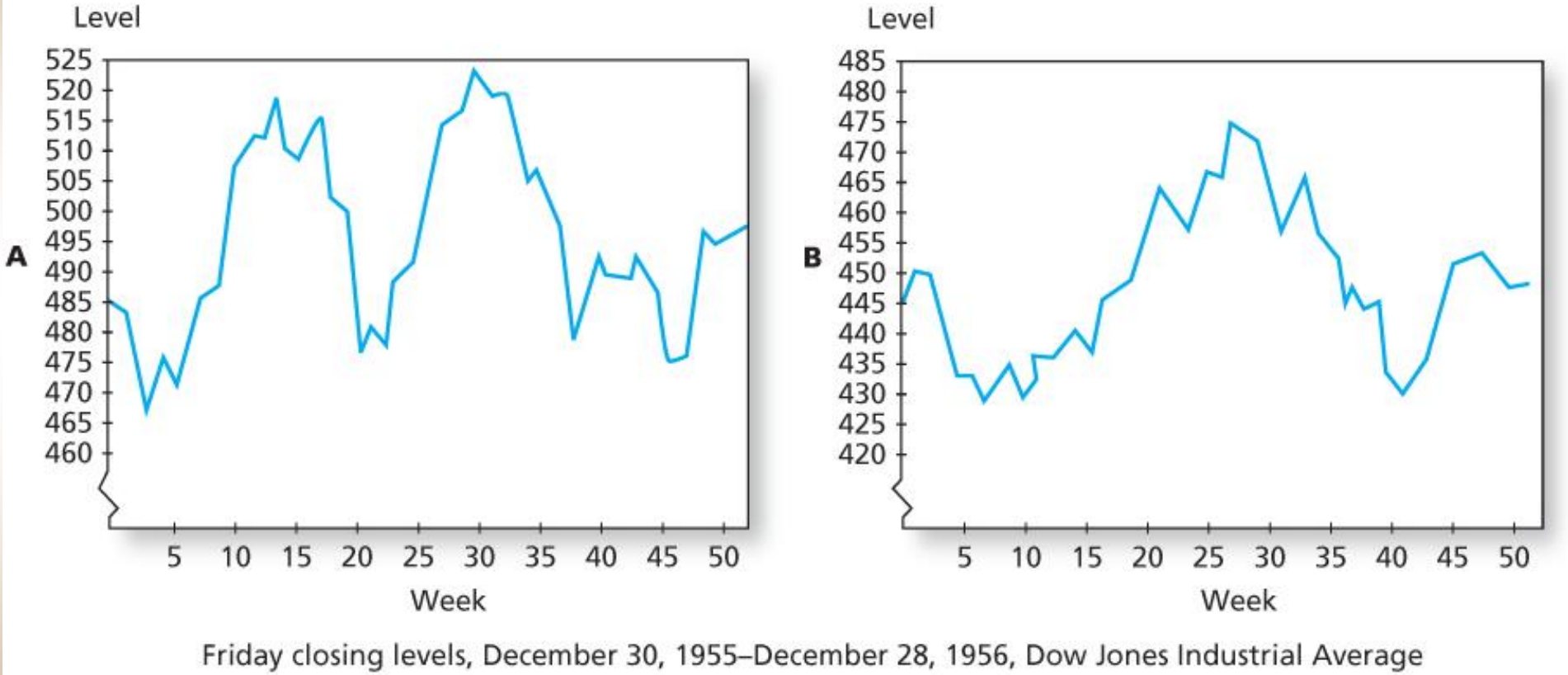


Figure 12.8 Actual and simulated levels for stock market prices of 52 weeks

Source: Harry Roberts, "Stock Market 'Patterns' and Financial Analysis: Methodological Suggestions," *Journal of Finance* 14 (March 1959), pp. 11–25. Reprinted by permission of the publisher, Blackwell Publishing, Inc.

Figure 12.9 Actual and Simulated Changes in Stock Prices for 52 Weeks

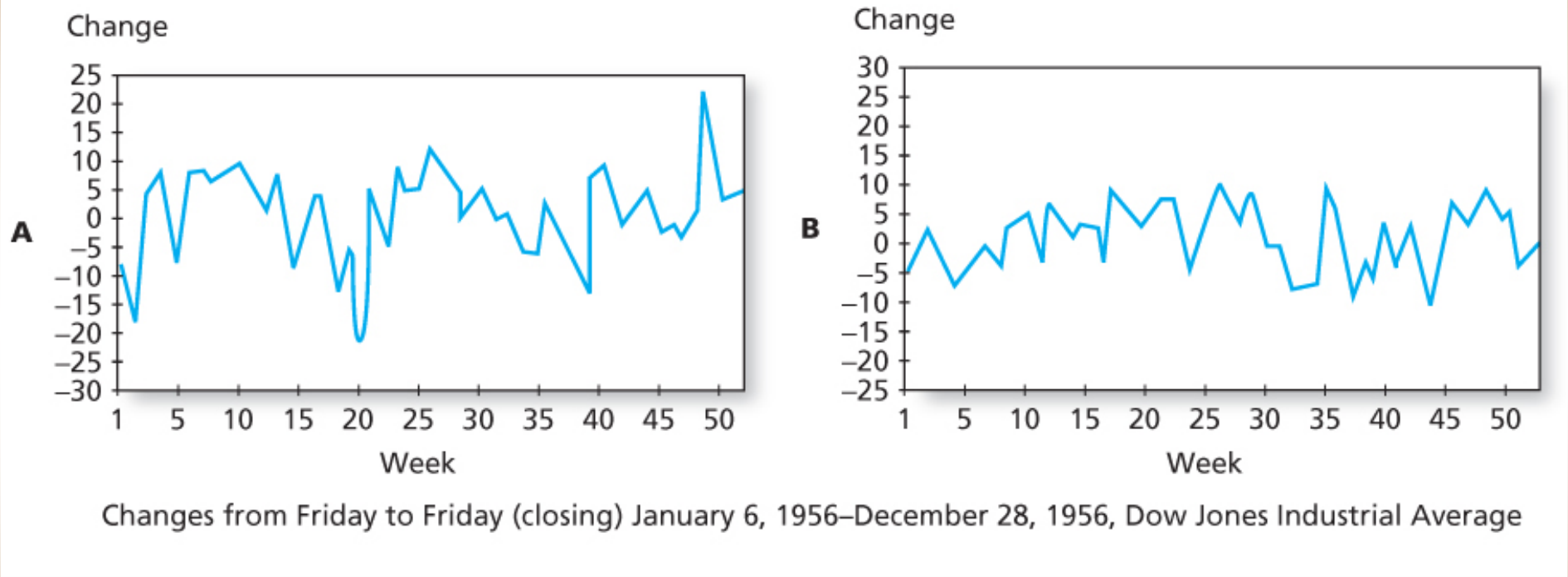


Figure 12.9 Actual and simulated changes in weekly stock prices for 52 weeks

Source: Harry Roberts, "Stock Market 'Patterns' and Financial Analysis: Methodological Suggestions," *Journal of Finance* 14 (March 1959), pp. 11–25. Reprinted by permission of the publisher, Blackwell Publishing, Inc.