

# CHAPTER 12

# TECHNICAL ANALYSIS

Presenter

Venue

Date



**CFA Institute**

# THE LOGIC OF TECHNICAL ANALYSIS



• **Supply and demand determine prices**

• **Changes in supply and demand cause changes in prices**

• **Prices can be projected with charts and other technical tools**

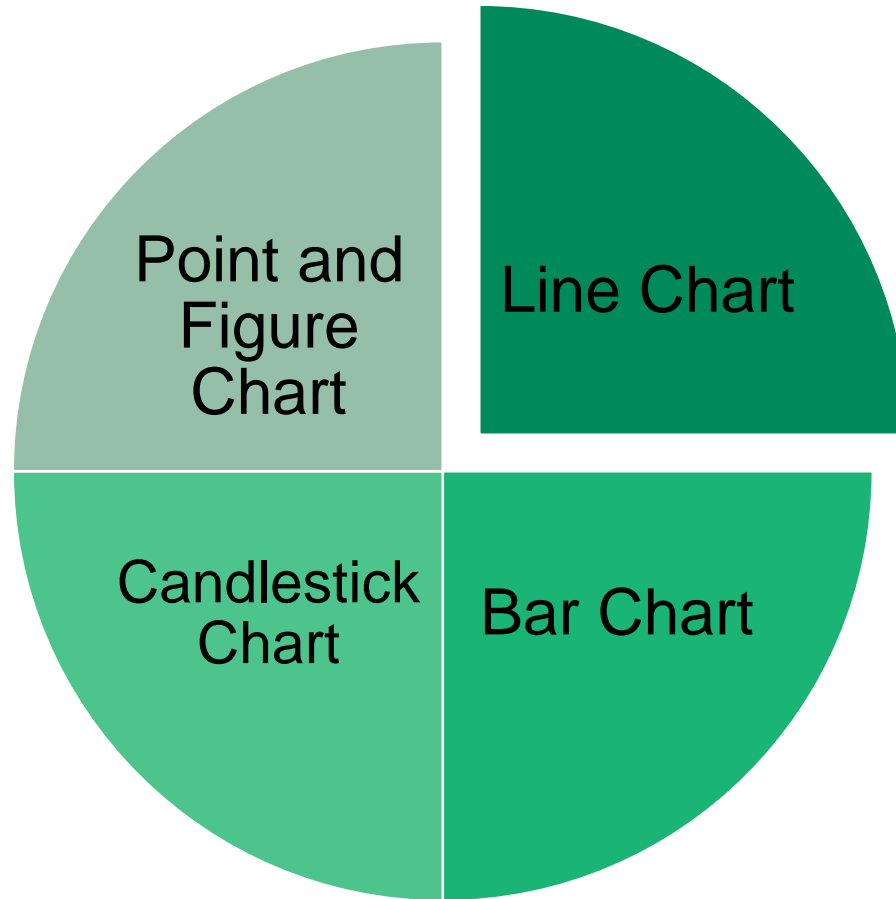
# ASSUMPTIONS OF TECHNICAL ANALYSIS

- 
- Human behavior is often erratic and driven by emotion.

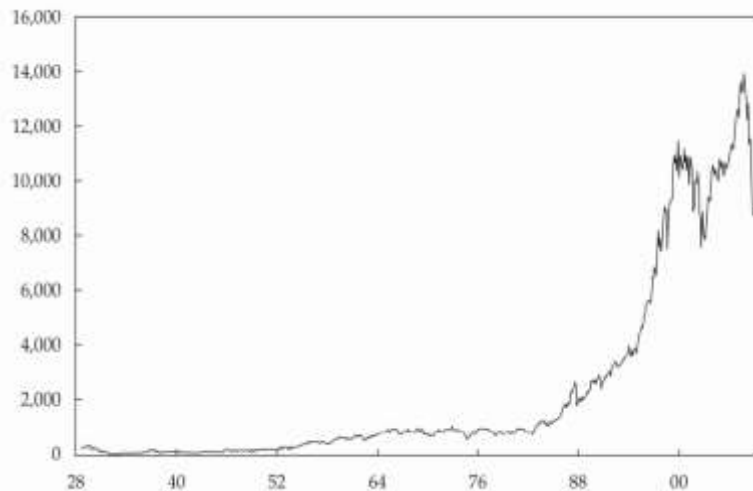
- 
- Market trends and patterns reflect irrational human behavior.

- 
- Trends and patterns repeat themselves and are thus predictable.

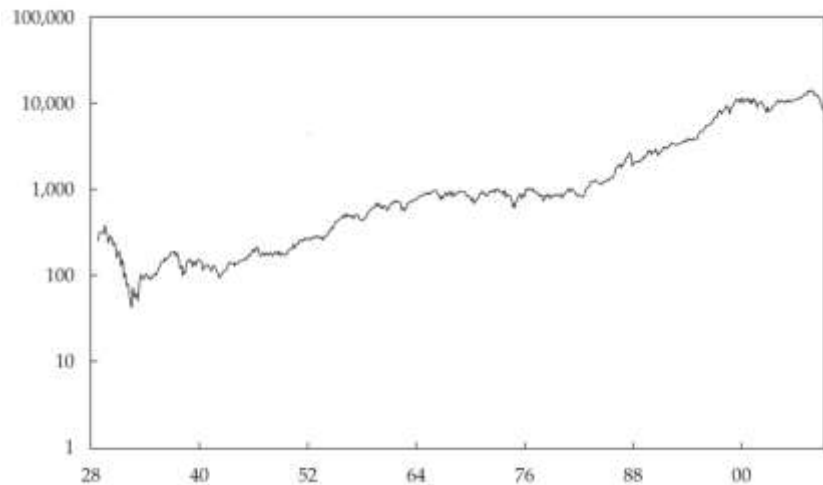
# CHARTS



# LINE CHARTS AND SCALE

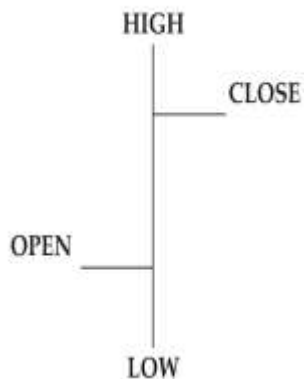


**EXHIBIT 12-7** Dow Jones Industrial Average on a Linear Scale, 1928–2010 (in U.S. dollars)

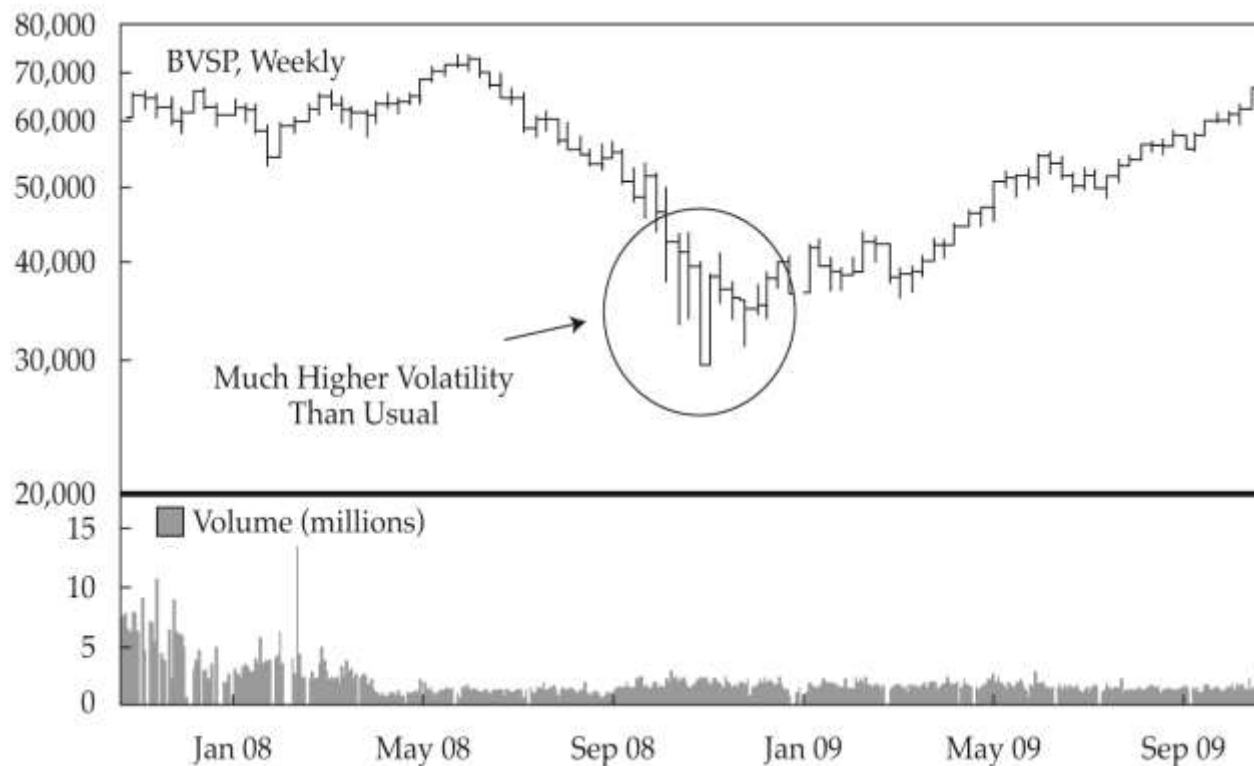


**EXHIBIT 12-8** Dow Jones Industrial Average on a Logarithmic Scale, 1928–2010 (in U.S. dollars)

# BAR CHARTS

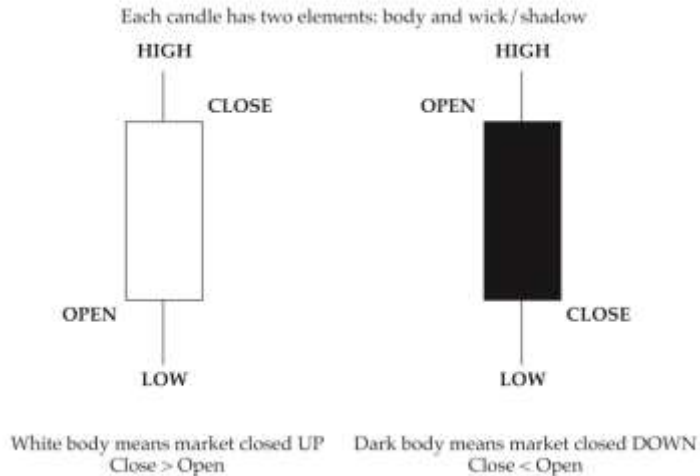


**EXHIBIT 12-2**  
Bar Chart  
Notation

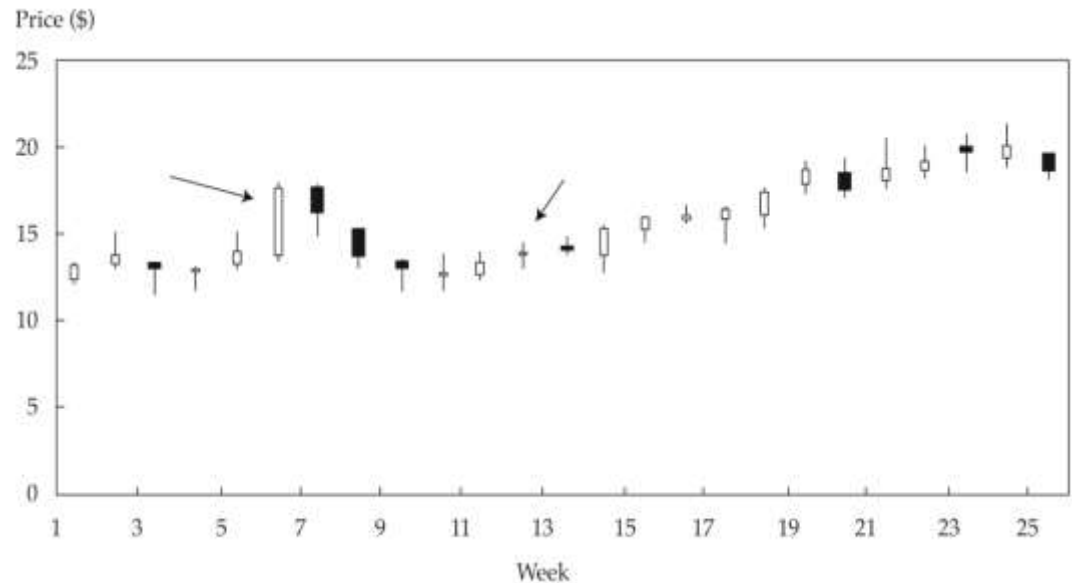


**EXHIBIT 12-3** Bar Chart: Bovespa Index, November 2007–November 2009 (price in Brazilian reais)

# CANDLESTICK CHARTS



**EXHIBIT 12-4**  
Construction of a  
Candlestick Chart



**EXHIBIT 12-5** Candlestick Chart:  
Companhia Vale do Rio Doce, 1  
January– 15 June 2009 (prices in U.S.  
dollars)

# POINT AND FIGURE CHARTS

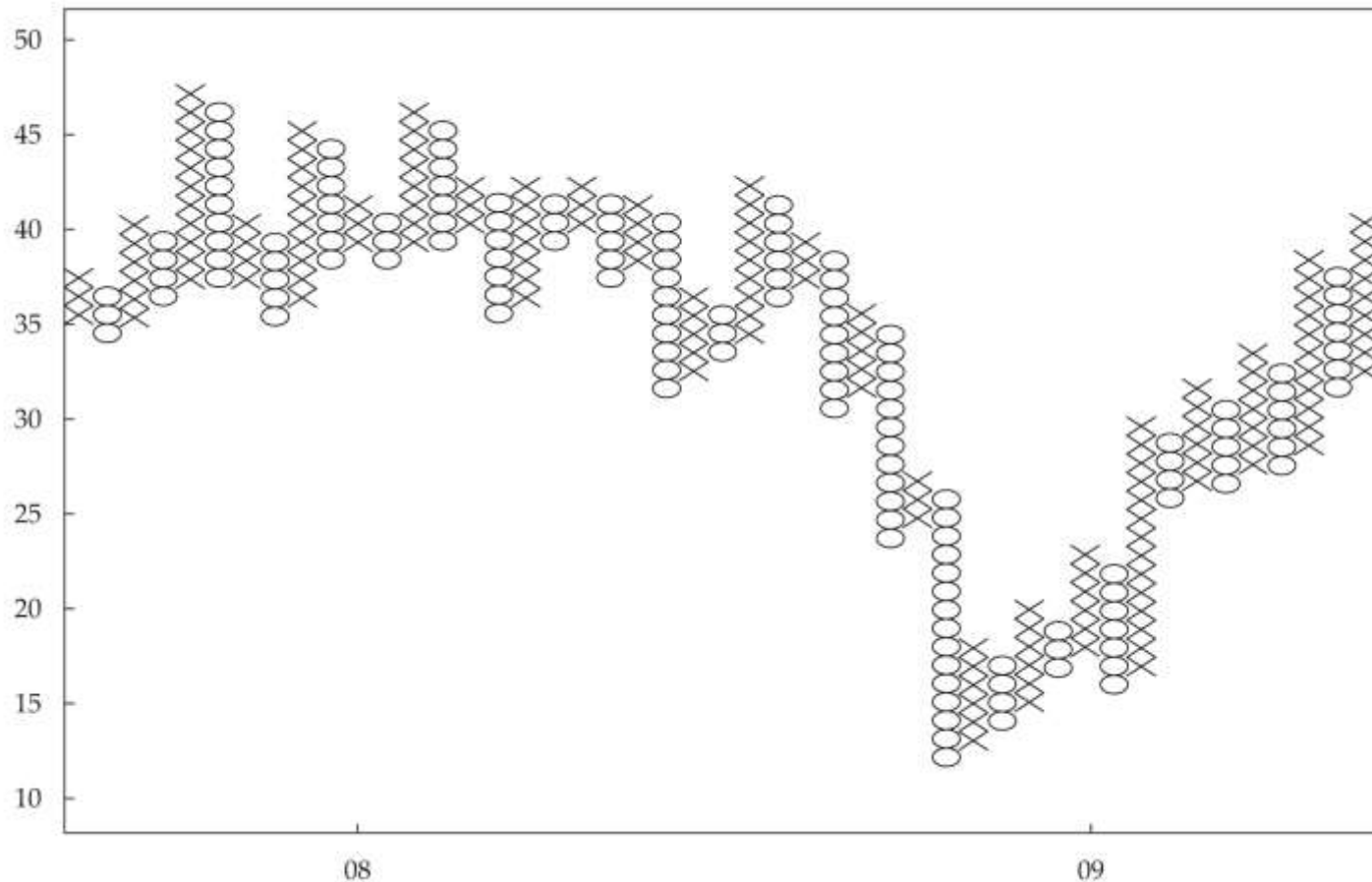
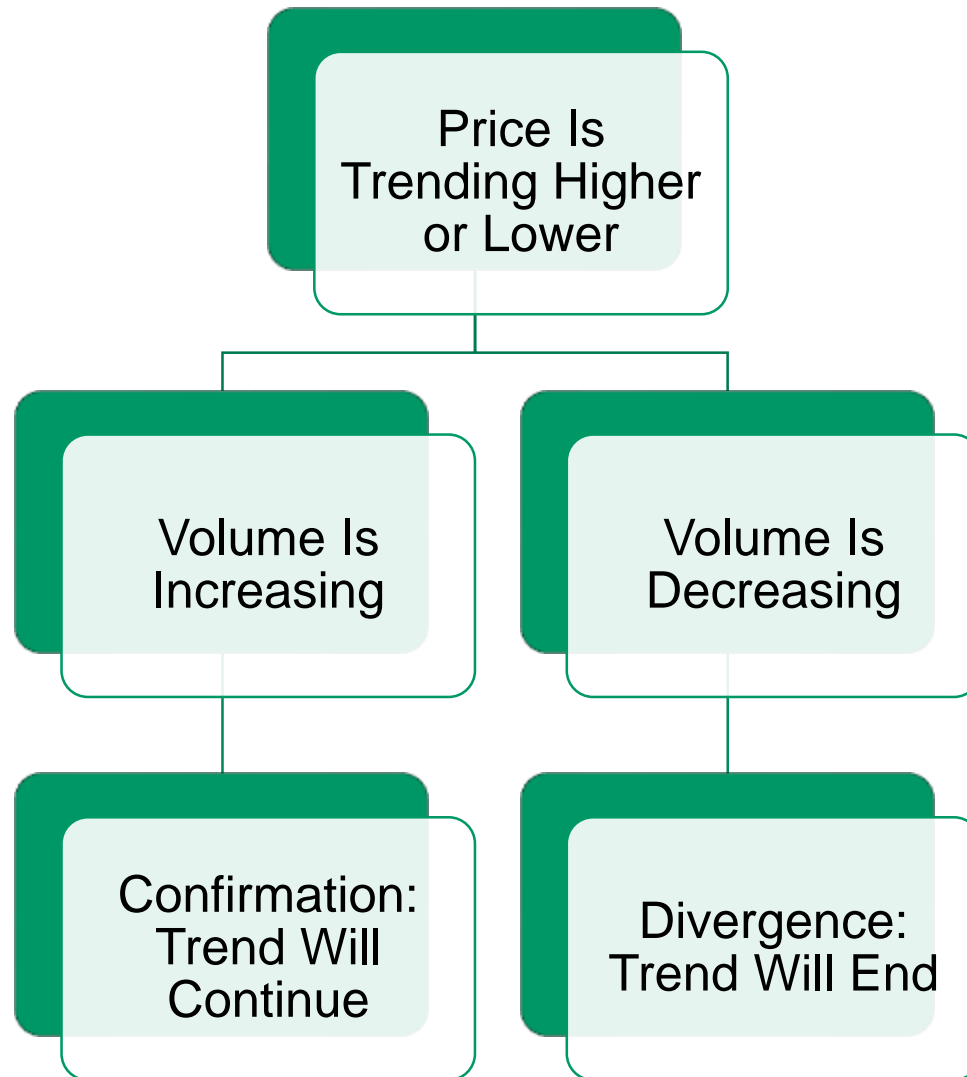


EXHIBIT 12-6 Point and Figure Chart: Wharf Holdings Daily Price Chart, 2007–2009 (Hong Kong dollars)

*Note:* The box size is HK\$1, and the reversal size is three.



# PRICE AND VOLUME



# RELATIVE STRENGTH ANALYSIS

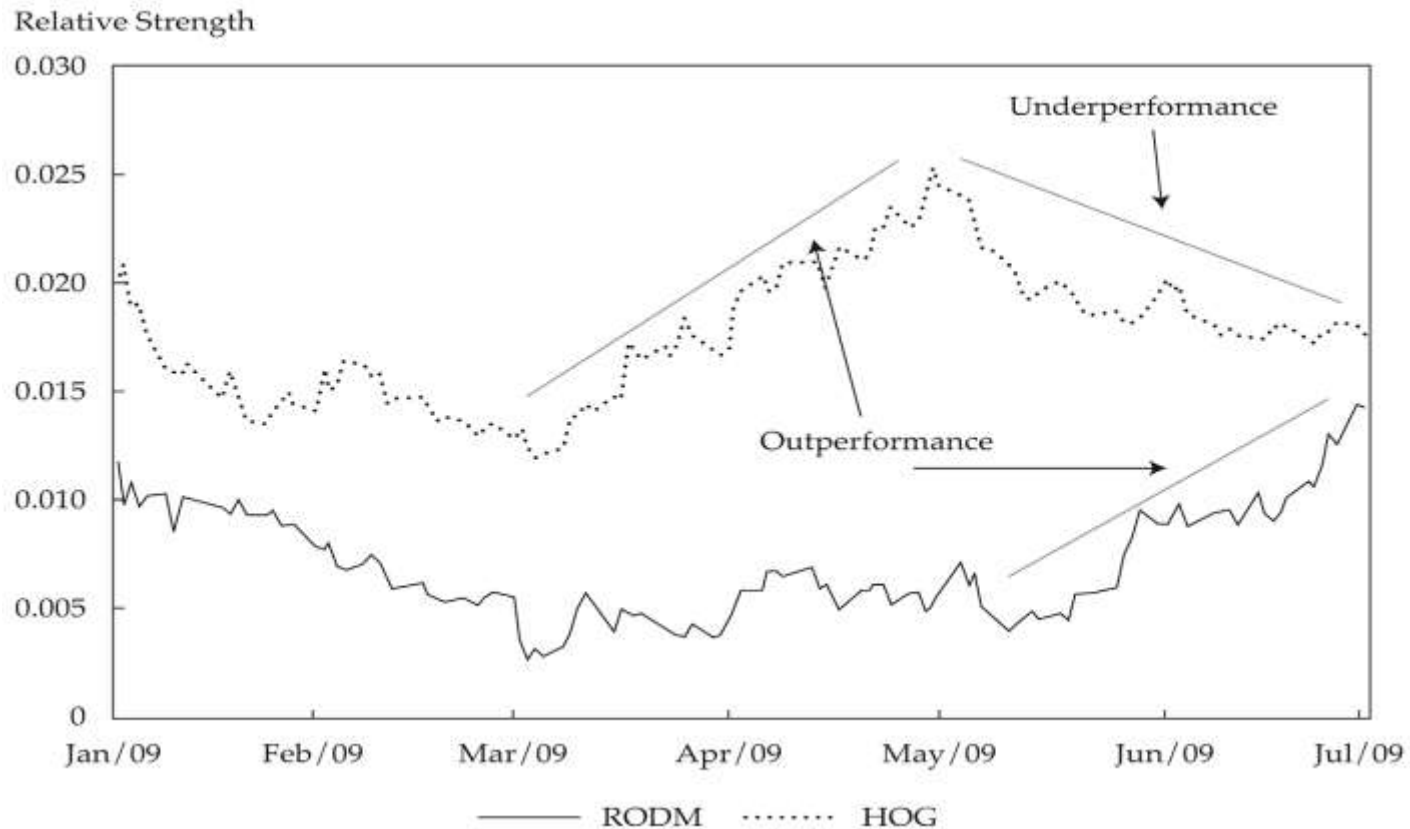


EXHIBIT 12-10 Relative Strength Analysis: HOG vs. the S&P 500 and RODM vs. the S&P 500, January–June 2009

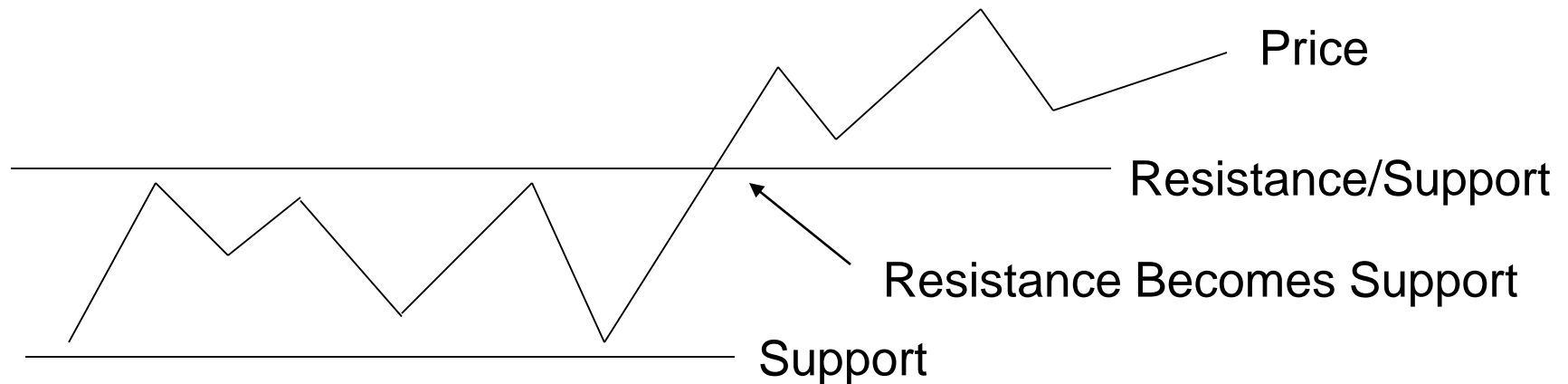
# TREND ANALYSIS



EXHIBIT 12-11 Trend Analysis: China Mobile Weekly Price Chart, 2002–2010 (prices in Hong Kong dollars)



# SUPPORT AND RESISTANCE



## Support

- A low price range in which buying activity is sufficient to stop a decline in price

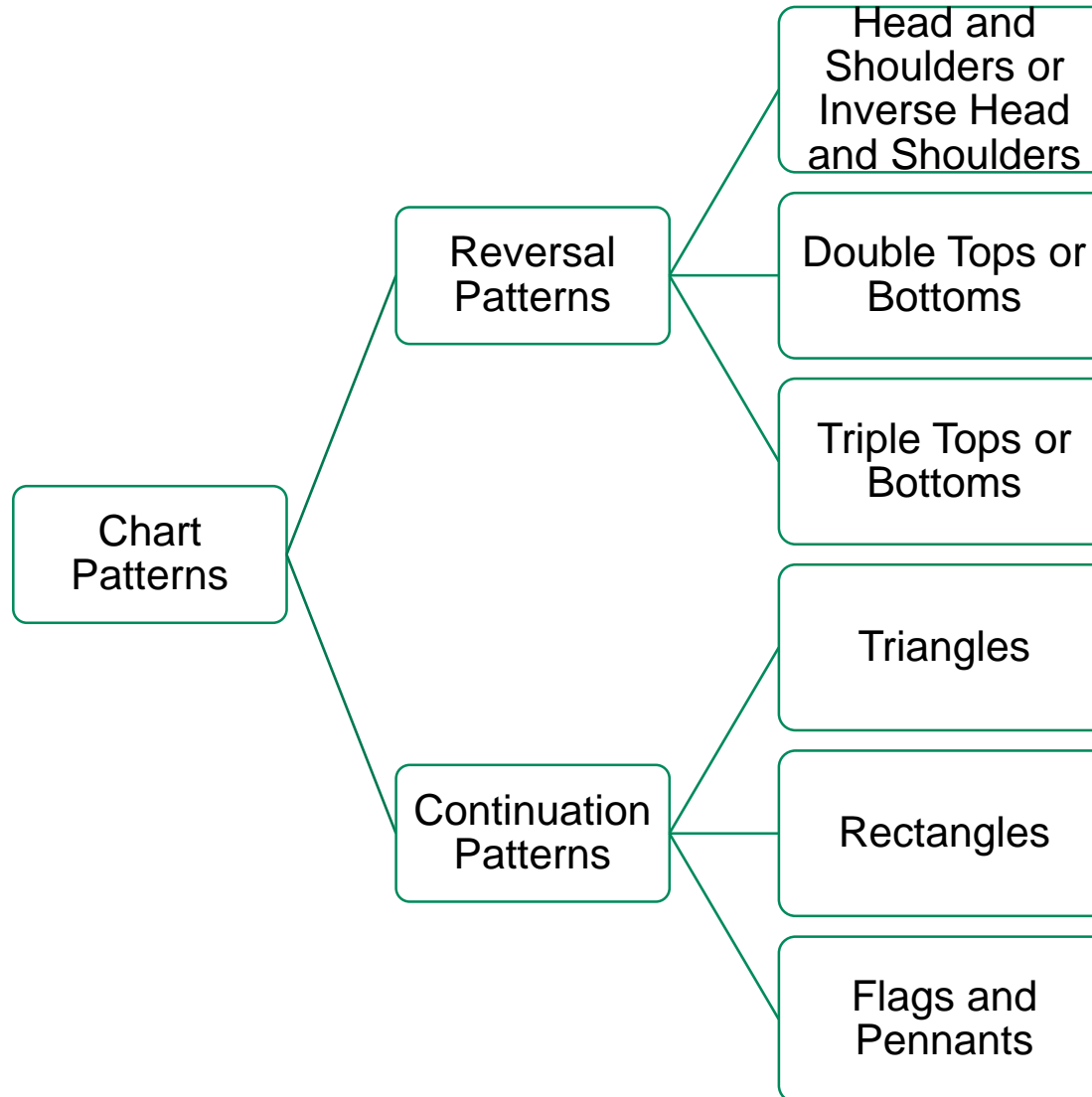
## Resistance

- A high price range in which selling activity is sufficient to stop a rise in price

## Change in Polarity

- Once a resistance (support) level is breached, it becomes a support (resistance) level

# CHART PATTERNS



# HEAD AND SHOULDERS

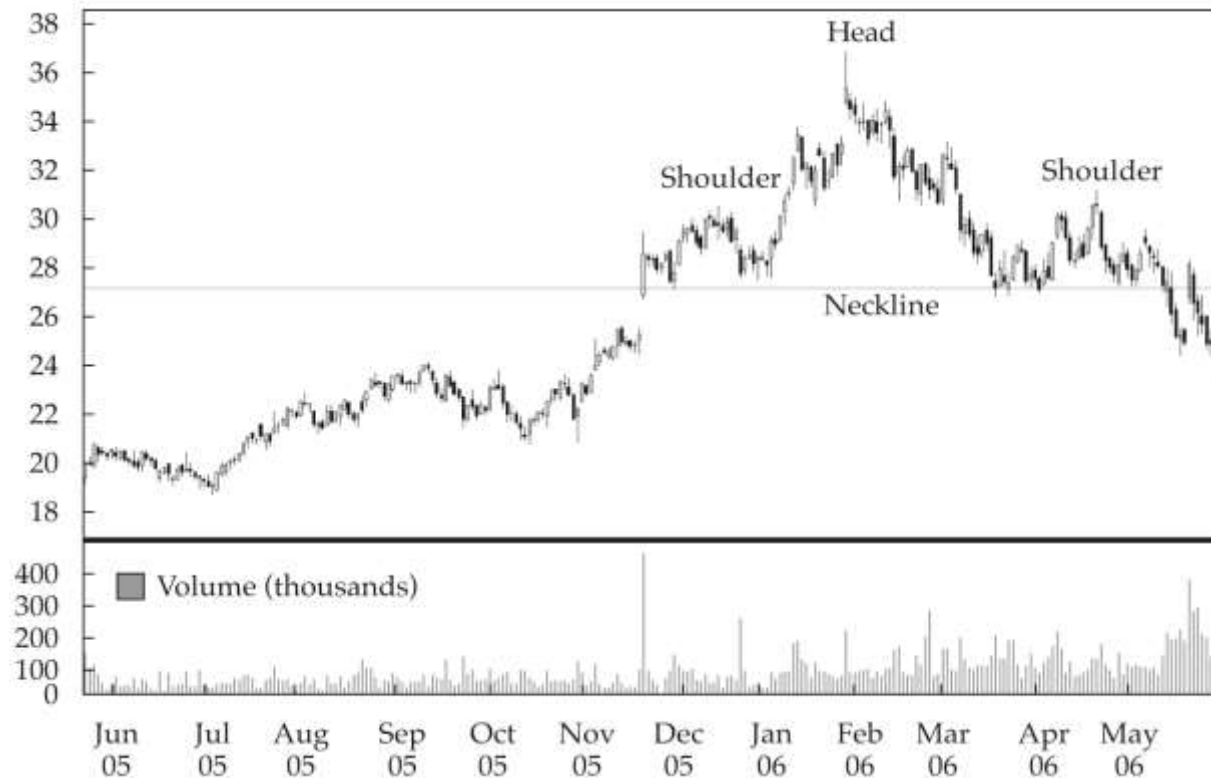


EXHIBIT 12-13 Head and Shoulders Pattern: Marvell Technology Daily Price Chart, June 2005–June 2006 (price in U.S. dollars ÷ 100)

(Head and Shoulders) Price target = Neckline – (Head – Neckline)

(Inverse Head and Shoulders) Price target = Neckline + (Head – Neckline)

# DOUBLE TOPS AND BOTTOMS



EXHIBIT 12-16 Double-Bottom Pattern: Time Warner Daily Price Chart, November 2007–October 2009 (price in U.S. dollars)

# TRIPLE TOPS AND BOTTOMS

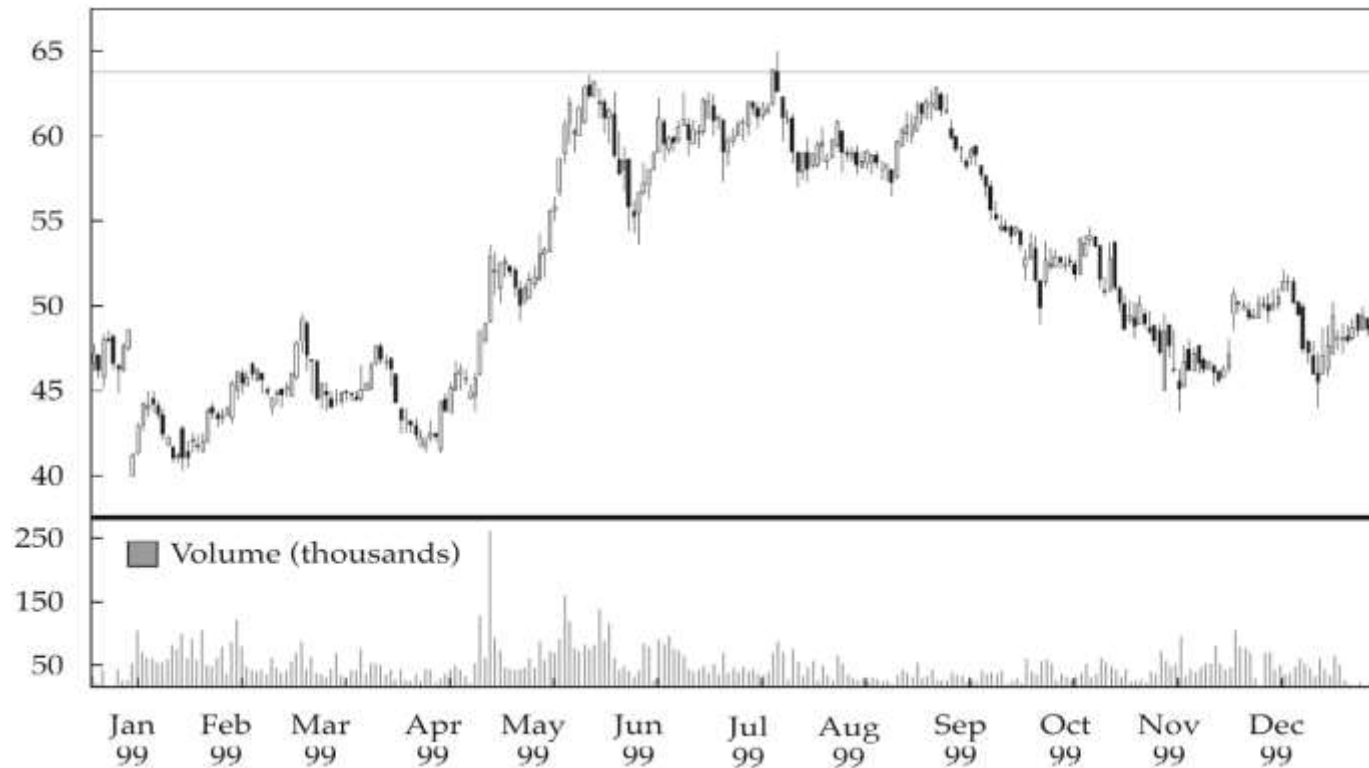
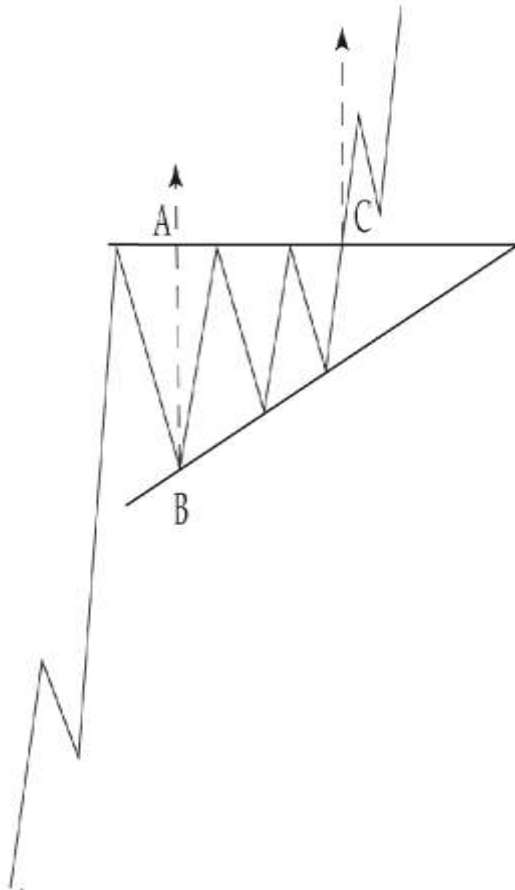


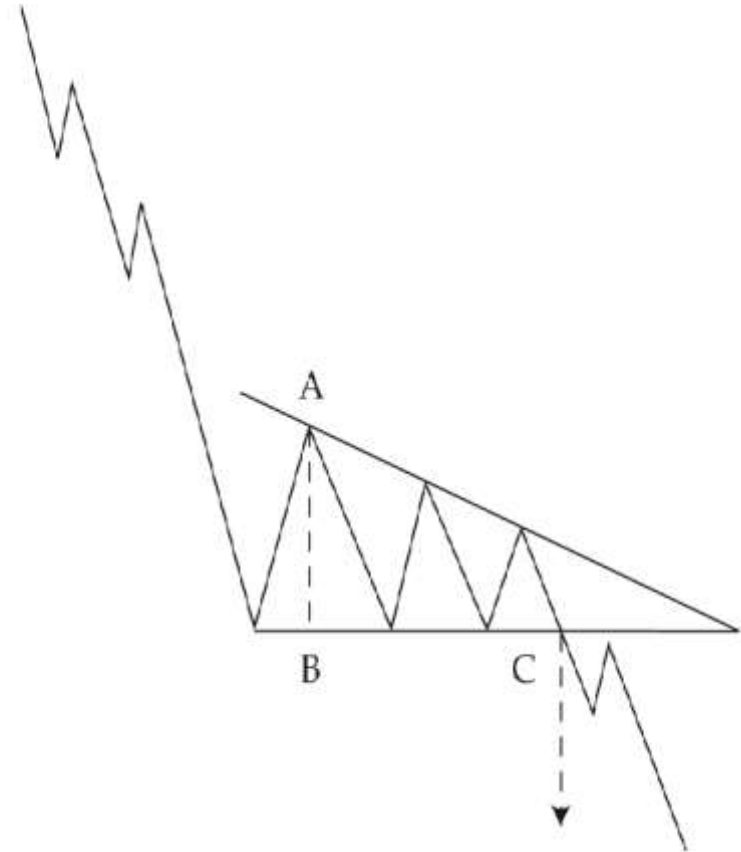
EXHIBIT 12-17 Triple-Top Pattern: Rockwell Automation Daily Price Chart, 1999 (price in U.S. dollars)



# TRIANGLES



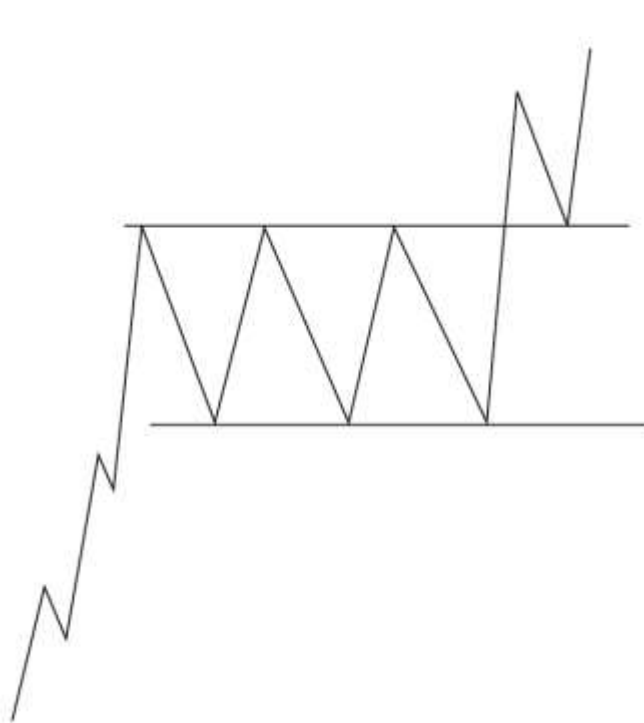
**EXHIBIT 12-18**  
Ascending Triangle Pattern



**EXHIBIT 12-19**  
Descending Triangle Pattern

# RECTANGLES

Bullish Rectangle



Bearish Rectangle

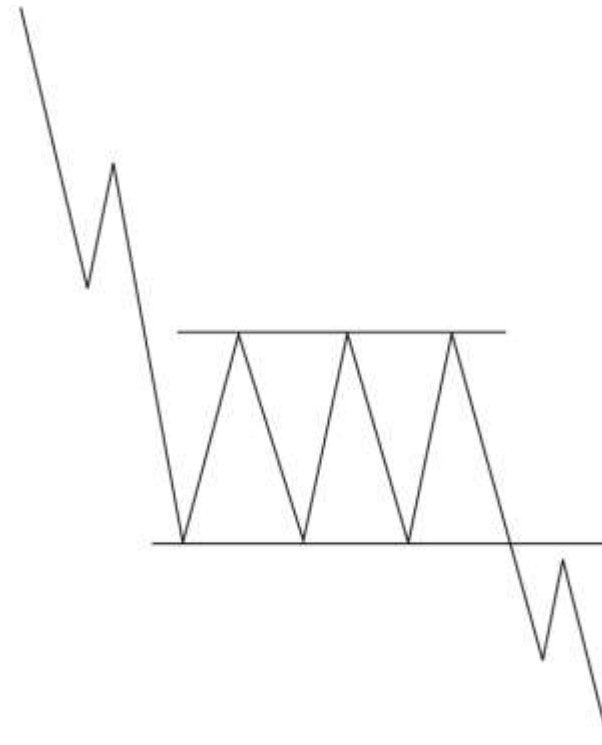


EXHIBIT 12-21 Rectangle Patterns

# FLAGS AND PENNANTS

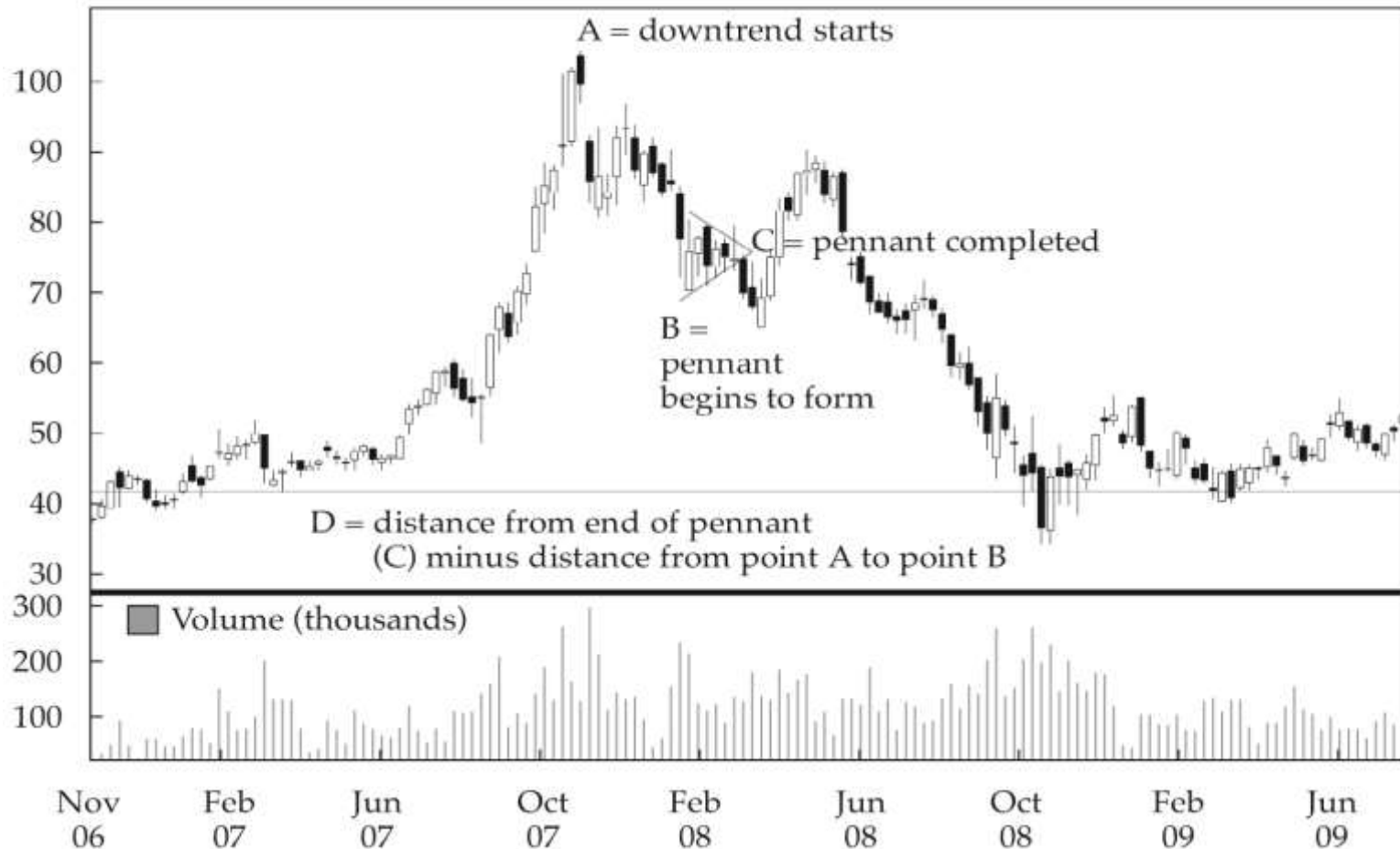
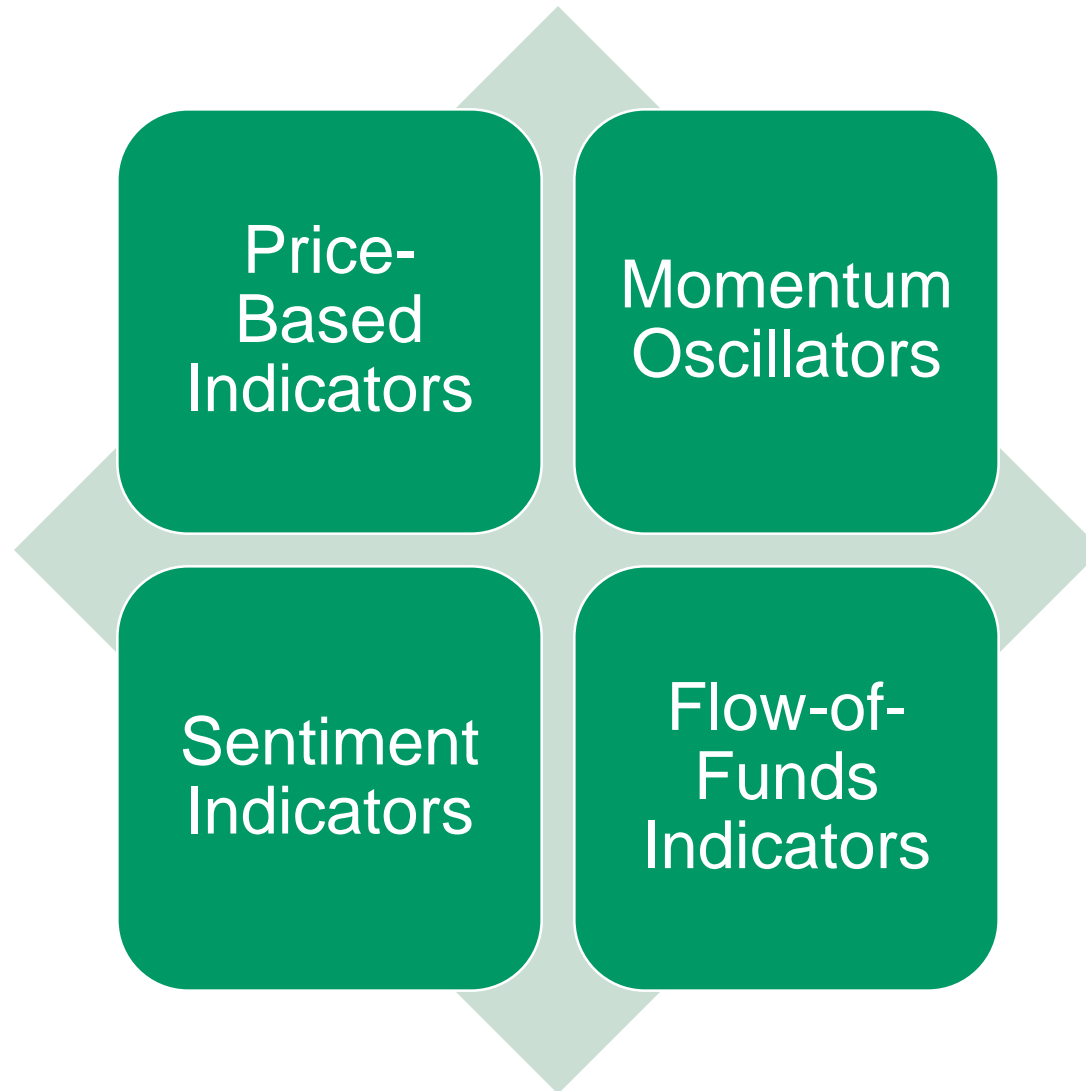


EXHIBIT 12-22 Pennant Formation: China Mobile ADR, November 2006–July 2009 (price in U.S. dollars)

# TECHNICAL INDICATORS



# PRICE-BASED INDICATOR: MOVING AVERAGE

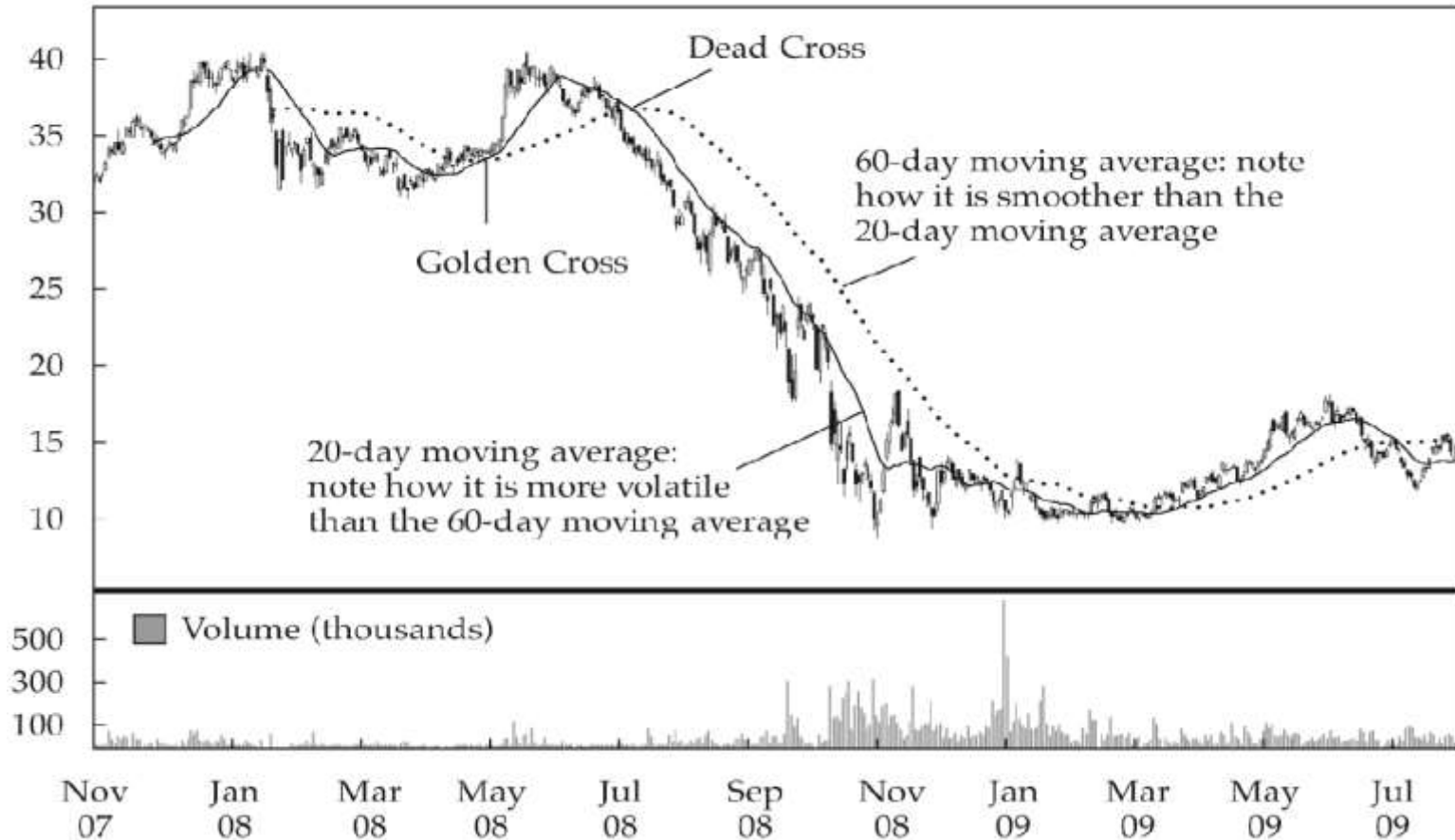


EXHIBIT12-23 Daily Price Chart with 20-Day and 60-Day Moving Averages: Gazprom EDR, November 2007–August 2009 (price in euros)

# PRICE-BASED INDICATOR: BOLLINGER BAND

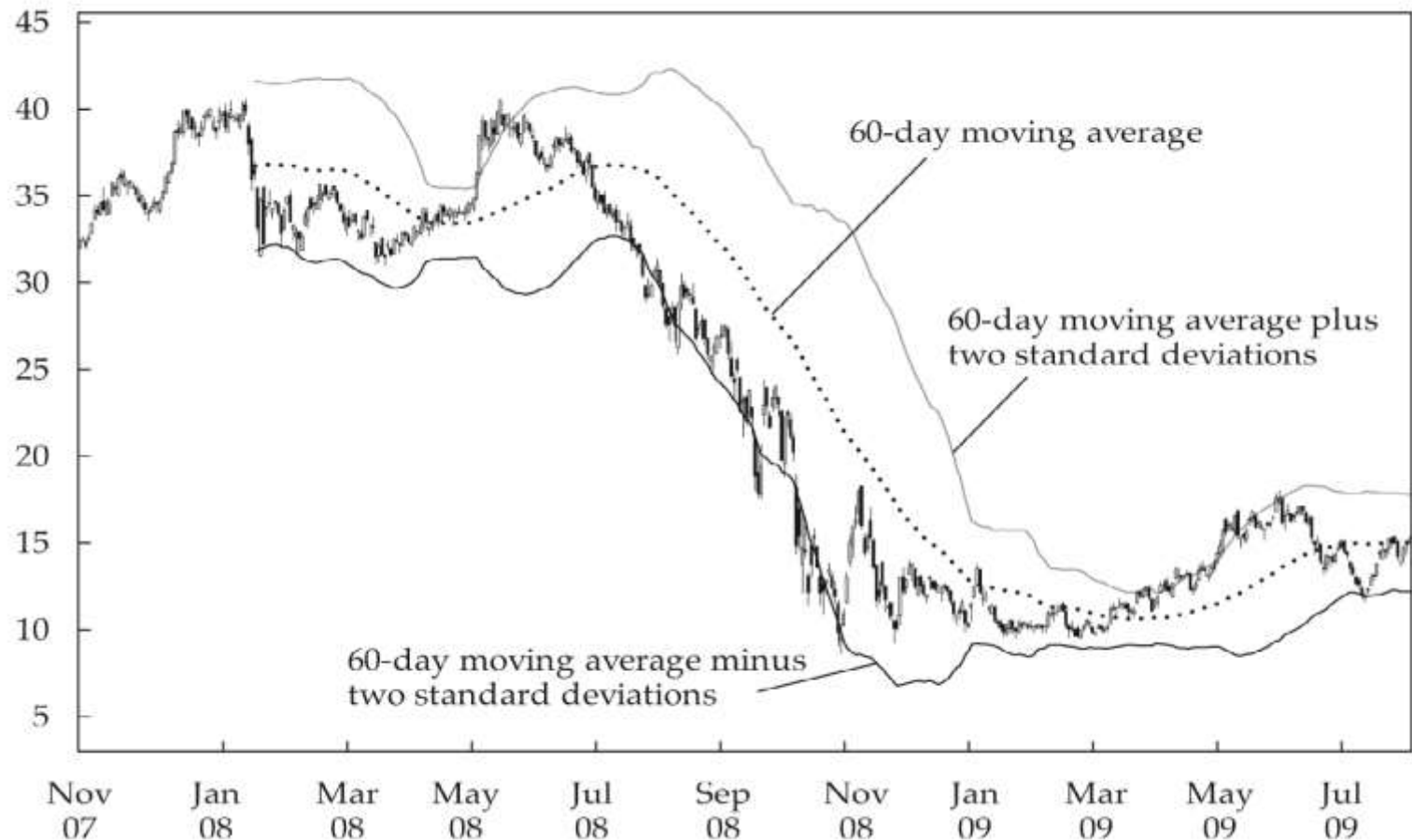


EXHIBIT 12-24 Bollinger Band Using 60-Day Moving Average and 2 Standard Deviations: Gazprom EDR Daily Price Chart, November 2007–August 2009 (price in euros)

# MOMENTUM OSCILLATOR: RATE OF CHANGE OSCILLATOR ( $M = V \div VX \times 100$ )



EXHIBIT 12-25 Momentum Oscillator with 100 as Midpoint: Toyota Motor, May 2008–October 2009 (price in Japanese yen)

# MOMENTUM OSCILLATOR: RELATIVE STRENGTH INDEX

$$RSI = 100 - \frac{100}{1 + RS}$$

$$RS = \frac{\sum (\text{Up changes for the period under consideration})}{\sum (|\text{Down changes for the period under construction}|)}$$



EXHIBIT 12- 27 Candlestick Chart with RSI: Ford, January–August 2009 (price in U.S. dollars)



# MOMENTUM OSCILLATOR: STOCHASTIC OSCILLATOR

$$\%K = 100 \left( \frac{C - L14}{H14 - L14} \right)$$

%D = Average of the last three %K values calculated daily

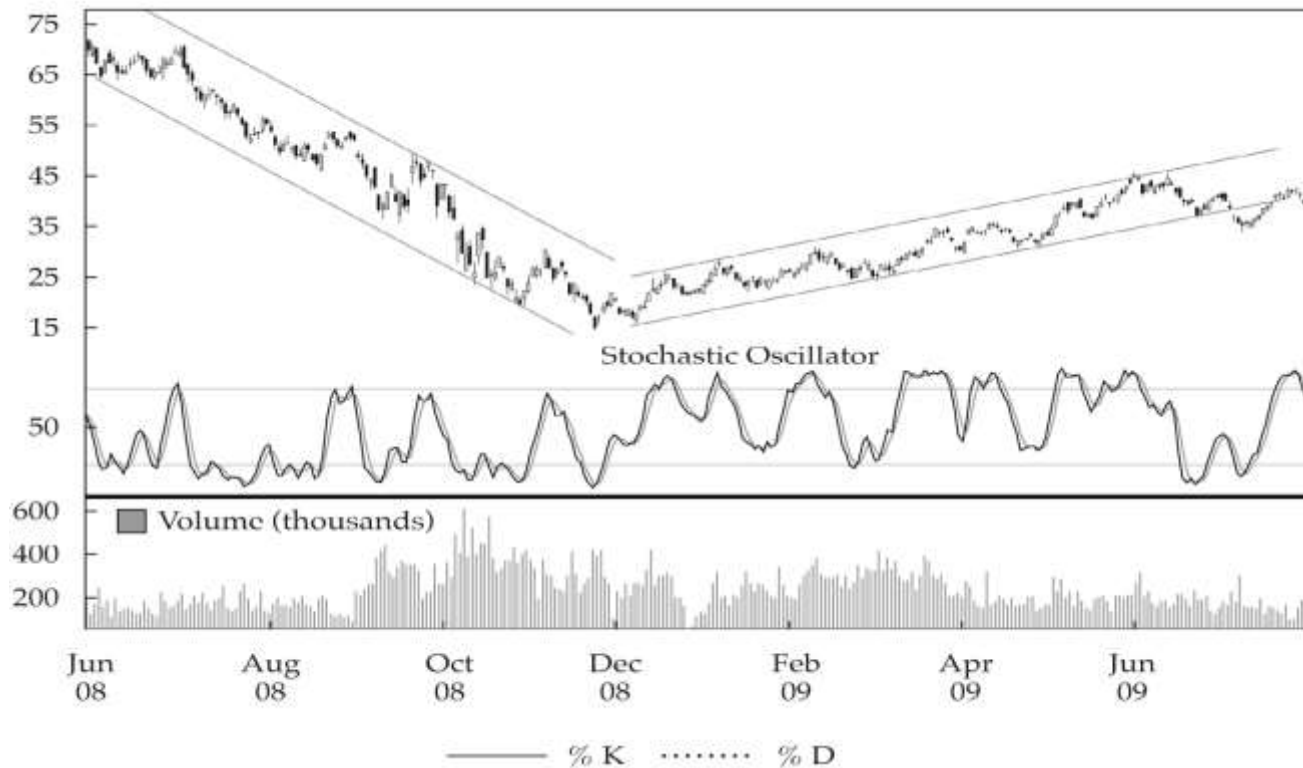


EXHIBIT 12-28 Weekly Price Chart and Stochastic Oscillator: Petroleo Brasileiro ADR, June 2008–July 2009 (price in U.S. dollars)

# MOMENTUM OSCILLATOR: MACD OSCILLATOR

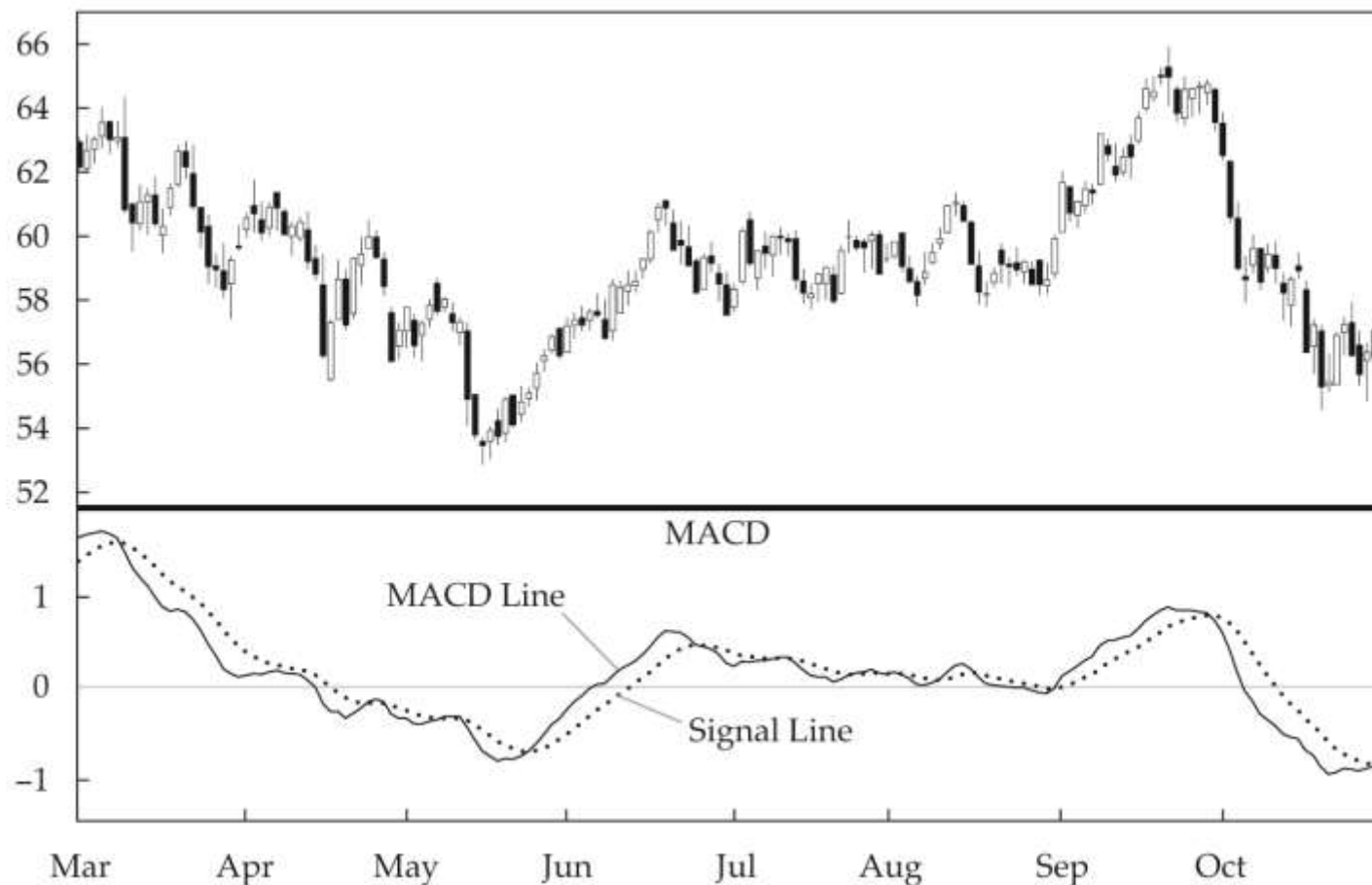


EXHIBIT12-29 MACD and Daily Price Chart: Exxon Mobil, March–November 2005 (price in U.S. dollars)

# SENTIMENT INDICATOR: OPINION POLLS

Opinion

Investors Intelligence Advisors' Sentiment Report

Opinion

Market Vane Bullish Consensus

Opinion

Consensus Bullish Sentiment Index

Opinion

Daily Sentiment Index

Opinion

AAll Investor Sentiment Survey

# SENTIMENT INDICATOR: CALCULATED STATISTICAL INDICES

## Put/Call Ratio

- Normally below 1.0
- Considered a contrary indicator

## CBOE Volatility Index

- Based on options on stocks in the S&P 500
- Used with trend, pattern, or oscillator tools

## Margin Debt

- Rising margin debt believed to be a signal of aggressive buying
- Considered a contrary indicator

## Short Interest Ratio

- Short interest ÷ Average daily trading volume
- Considered a contrary indicator

# FLOW-OF-FUNDS INDICATOR: ARMS INDEX (TRIN)

$$\text{Arms Index} = \frac{\text{Number of advancing issues} / \text{Number of declining issues}}{\text{Volume of advancing issues} / \text{Volume of declining issues}}$$

Index Value

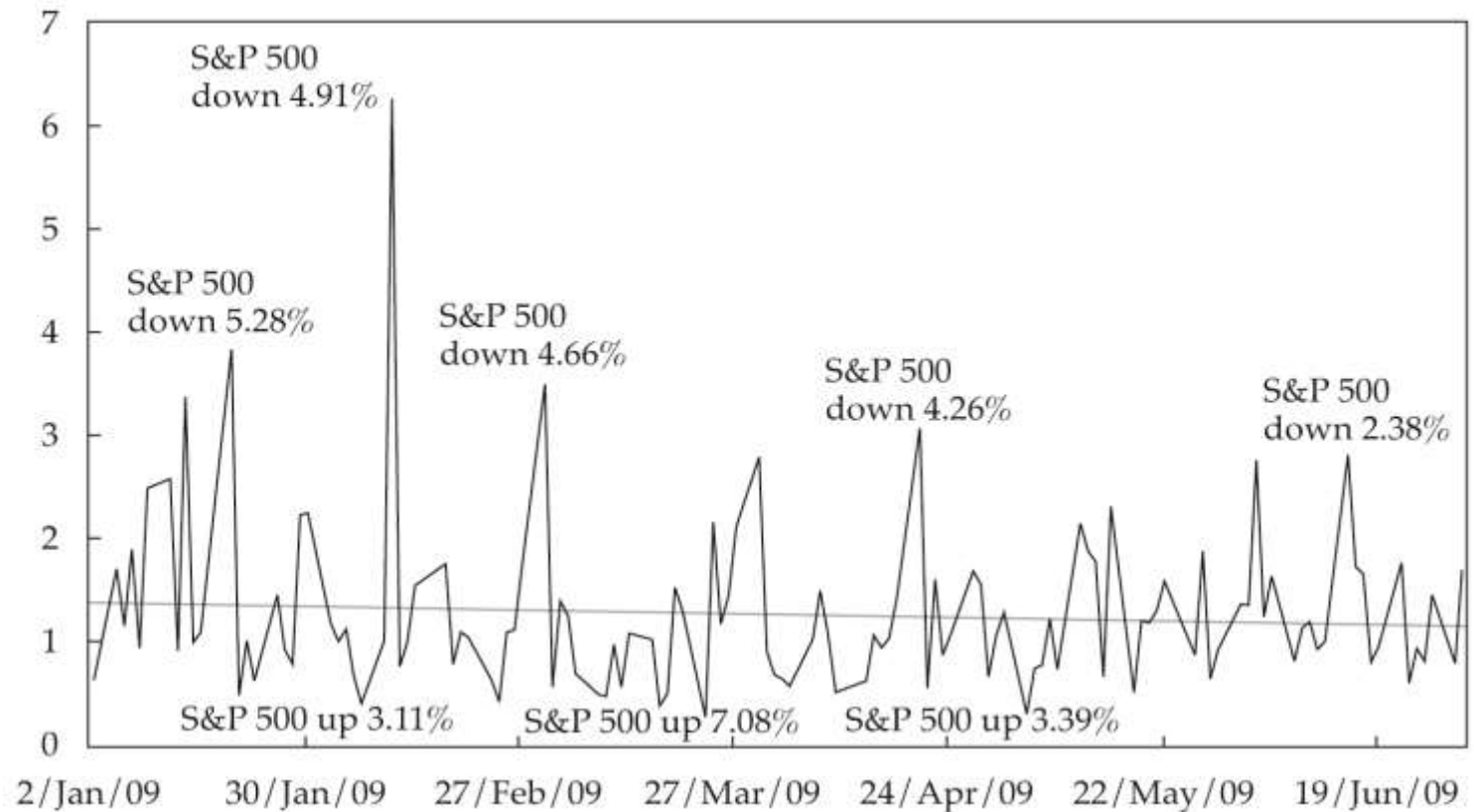


EXHIBIT12-32 Arms Index for the S&P 500, January–July 2009

# OTHER FLOW-OF-FUNDS INDICATORS

## Margin Loans

- Ability to buy stock on margin may increase demand
- Declining margin balances may result in forced selling

## Mutual Fund Cash Positions

- Considered a contrary indicator: High cash balances represent buying power
- Some analysts take into account the level of interest rates

## New Equity Issuance and Secondary Offerings

- Considered a contrary indicator: High issuance and offerings are considered signs of a market top

# CYCLES

## Kondratieff Wave (K-wave)

- Western economies have a 54-year cycle
- Originally tied to economic cycles and commodity prices

## 18-Year Cycle

- $3 \times 18 \text{ years} = 54 \text{ years}$
- Most often mentioned in connection with real estate prices

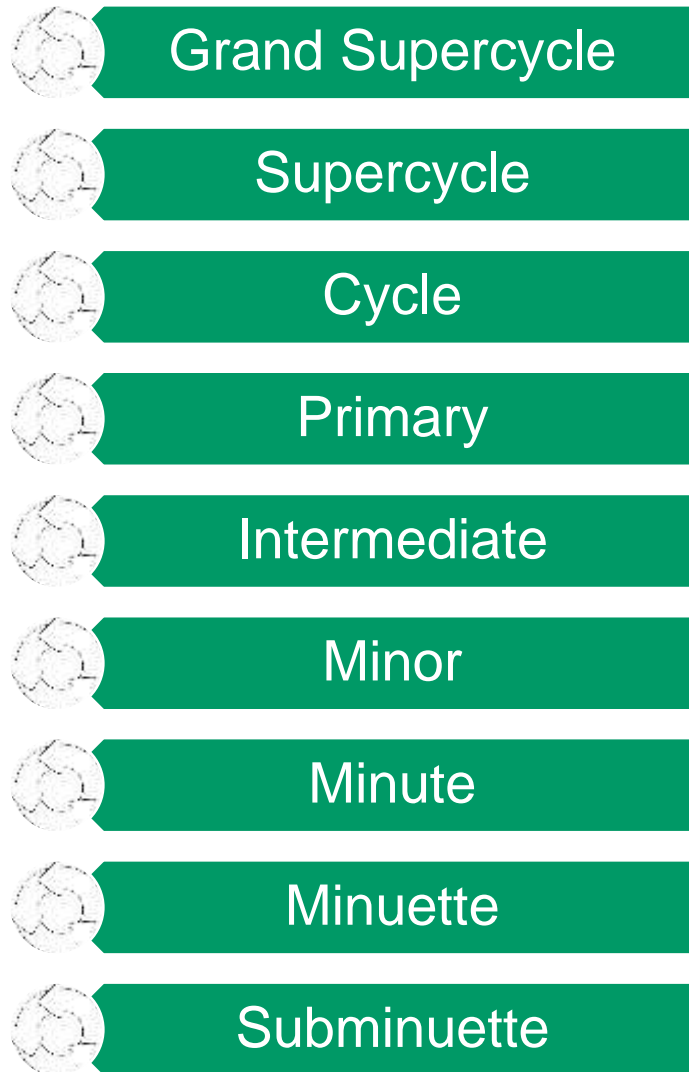
## Decennial Pattern

- Pattern of market returns broken down based on the last digit of a year
- Years ending in 5 have the best returns

## Presidential Cycle

- Returns broken down by year of U.S. President's term in office
- Third year (year prior to next election) has best historical performance

# ELLIOTT WAVE THEORY

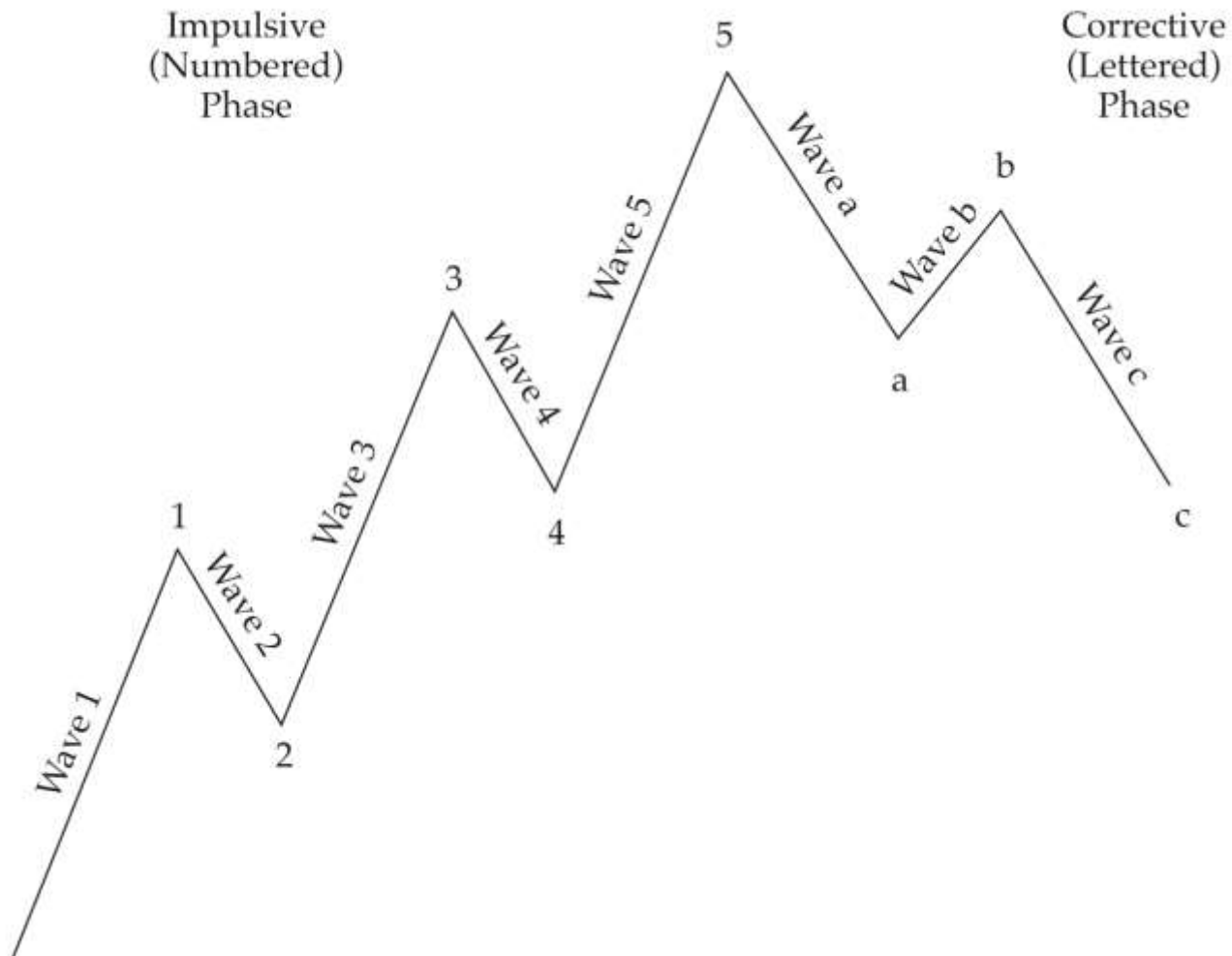


Follow patterns that are ratios of

Fibonacci Sequence:  
0, 1, 1, 2, 3,  
5, 8, 13,  
21...

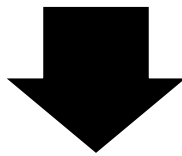


# EXHIBIT 12-34 IMPULSE WAVES AND CORRECTIVE WAVES



# INTERMARKET ANALYSIS

Inflection points in  
one market



May be a warning  
sign of a change  
in trend in another  
market

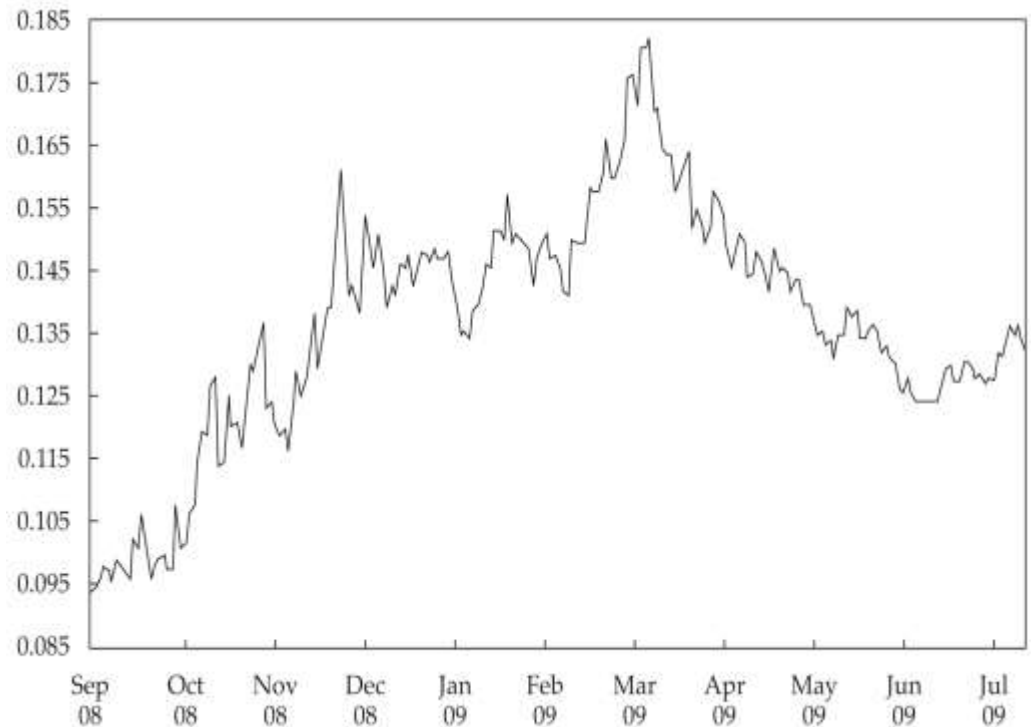


EXHIBIT 12-35 Relative Strength of 10-Year T-Bonds vs. S&P 500, September 2008–July 2009

# SUMMARY

- Principles, applications, and assumptions of technical analysis
- Construction and interpretation of charts
- Trend, support, and resistance lines, and change in polarity
- Common technical analysis patterns, indicators, and cycles
- Elliott Wave Theory
- Intermarket analysis