Chapter 3

How Securities are Traded (Cont'd)

Margin Trading Magnifies Profits and Losses

Change in Stock Price	End-of-Year Value of Shares	Repayment of Principal and Interest*	Investor's Rate of Return
30% increase	$26,000	$10,900	51%
No change	20,000	10,900	−9
30% decrease	14,000	10,900	−69

*Assuming the investor buys $20,000 worth of stock by borrowing $10,000 at an interest rate of 9% per year.

Short Sales

Purpose

- To profit from a decline in the price of a stock or security

Mechanics

- Borrow stock from a broker/dealer, must post margin
- Sell it and deposit proceeds in a margin account
- Closing out the position: buy the stock and broker return to the party from which it was borrowed

Shortselling on Margin - Example 2

You short sell 100 shares of IBM stock at $100 per share. Your broker required 50% margin.

How much is required in your account for you to be able to short sell IBM?

If IBM.s stock drops to $70 per share and you close your short position, what are your profits (HPR)?

Suppose your broker's maintenance margin is 30%. When will you receive a margin call?

Naked Shorts

SEC Issues New Rules to Protect Investors Against Naked Short Selling Abuses

FOR IMMEDIATE RELEASE
2008-204

Washington, D.C., Sept. 17, 2008 — The Securities and Exchange Commission today took several coordinated actions to strengthen investor protections against "naked" short selling. The Commission's actions will apply to the securities of all public companies, including all companies in the financial sector. The actions are effective at 12:01 a.m. ET on Thursday, Sept. 18, 2008.

- NYSE

Auction Market

- **NASDAQ**

Dealer Market

- **Dealer market is a market without *centralized order flow***
- **NASDAQ: largest organized stock market for OTC trading; information system for individuals, brokers and dealers**
- **Securities:**

stocks, most bonds and some derivatives

Electronic Trading on the NYSE

- SuperDot
  - Electronic order routing system allows brokers to electronically send orders directly to specialist.
    - Useful for program trading
- DirectPlus
  - Fully automated trade execution system
  - Execution time < ½ second
- Electronic order placement is growing, large orders still require human intervention.

Block Transactions and Block Houses

Year	Shares (millions)	% Reported Volume	Average Number of Block Transactions per Day
1965	48	03.1%	9
1970	451	15.4	68
1975	779	16.6	136
1980	3,311	29.2	528
1985	14,222	51.7	2,139
1990	19,682	49.6	3,333
1995	49,737	57.0	7,793
2000	135,772	51.7	21,941
2002	161,075	44.4	25,300
2004	116,926	31.9	17,000
2005	112,027	27.7	17,445
2006	97,576	21.3	14,360
2007	57,079	10.7	7,332

Source: Data from the New York Stock Exchange–Euronext, **www.nyse.com,** October 2008.

Electronic Computer Networks (ECNs)

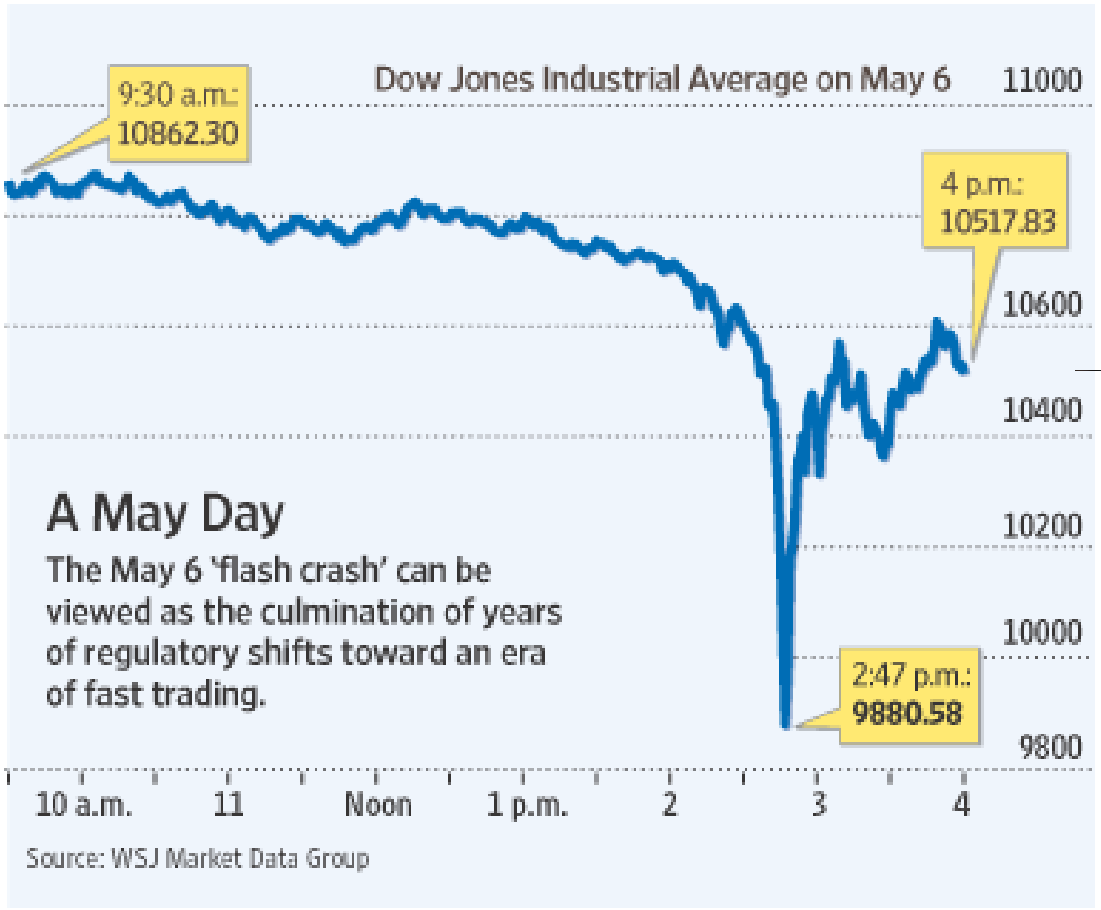
ECNs allow institutional investors to post quotes and trade directly with each other. (4th Market)

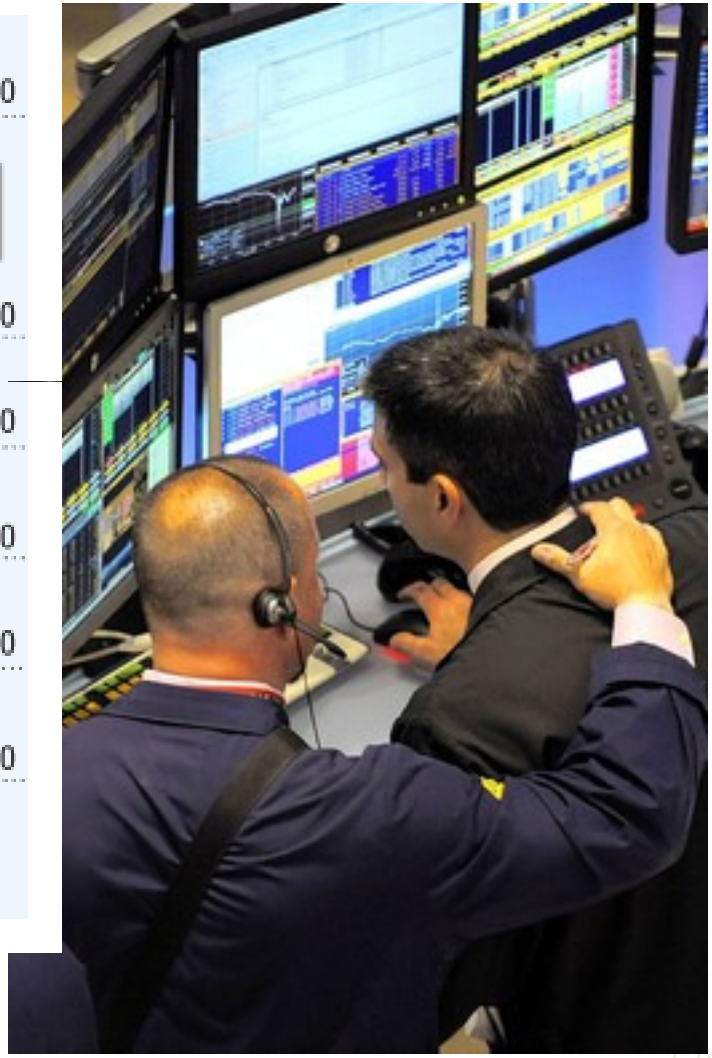
- Public limit order book
- Automatic execution

ECNs

	Symbol	Web Site
Archipelago	ARCA	www.archipelago.com
Bloomberg Tradebook	BTRD	www.bloombergtradebook.com
Brass Utility	BRUT	www.ebrut.com
Instinet/Island	INET	www.inetats.com
NexTrade	NTRD	www.nextrade.com
TrackData	TRAC	www.trackdata.com

Program Trading and the Flash Crash of May 6, 2010





Chapter 5

Risk and Return

Risk and Risk Premiums

Rates of Return: Single Period

$$HPR = \frac{P_1 - P_0 + D_1}{P_0}$$

HPR = Holding Period Return

P_0 = Beginning price

P_1 = Ending price

D_1 = Dividend during period one

Rates of Return: Single Period Example

Ending Price =	48
Beginning Price =	40
Dividend =	2

HPR = (48 - 40 + 2)/ (40) = 25%

Annualizing HPRs

Annualizing HPRs for holding periods of greater than one year:

- **Without compounding (Simple or APR):**
  HPR_{ann} = HPR/n

- **With compounding: EAR**
- **HPR_{ann} =** $[(1+HPR)^{1/n}]-1$

  where n = number of years held

Measuring Ex-Post (Past) Returns

- *An example:* Suppose you buy one share of a stock today for $45 and you hold it for two years and sell it for $52. You also received $8 in dividends at the end of the two years.
- (PB = $45; PS = $52; CF = $8):
- HPR = (52 - 45 + 8) / 45 = 33.33%
- HPR_{ann} = 0.3333/2 = 16.66% *Annualized w/out compounding*

- The annualized HPR assuming annual compounding is (n = 2):
- HPR_{ann} = $(1+0.3333)^{1/2} - 1 = 15.47\%$

Arithmetic Average

An example: You have the following rates of return on a stock:

2000	-21.56%
2001	44.63%
2002	23.35%
2003	20.98%
2004	3.11%
2005	34.46%
2006	17.62%

$$HPR_{avg} = \sum_{T=1}^{n} \frac{HPR_T}{n}$$

$$HPR_{avg} = \frac{(-.2156 + .4463 + .2335 + .2098 + .0311 + .3446 + .1762)}{7} = 17.51\%$$

AAR = 17.51%

Geometric Average

An example: You have the following rates of return on a stock:

2000	-21.56%
2001	44.63%
2002	23.35%
2003	20.98%
2004	3.11%
2005	34.46%
2006	17.62%

- **With compounding (geometric average or GAR: Geometric Average Return):**

$$HPR_{avg} = \left[\prod_{T=1}^{n}(1+HPR_T)\right]^{1/n} - 1$$

$$HPR_{avg} = (0.7844\times1.4463\times1.2335\times1.2098\times1.0311\times1.3446\times1.1762)^{1/7} - 1 = 15.61\%$$

GAR = 15.61%

Measuring Ex-Post (Past) Returns

i. Dollar-weighted return procedure (DWR):

Find the internal rate of return for the cash flows (i.e. find the discount rate that makes the NPV of the net cash flows equal zero.)

Total Cash Flows Each Year

	Year 0	1	2
	-$50	$ 2	$ 4
		-$53	$108
Net	-$50	-$51	$112

- **NPV =** $\$0 = -\$50/(1+IRR)^0 - \$51/(1+IRR)^1 + \$112/(1+IRR)^2$

Solve for IRR:

- **IRR =** 7.117% average annual *dollar weighted* return

The DWR gives you an average return based on the stock's performance *and* the dollar amount invested (number of shares bought and sold) each period.

Real and Nominal Rates of Interest

- Nominal interest rate
  - Growth rate of your money
- Real interest rate
  - Growth rate of your purchasing power
- If *R* is the nominal rate and *r* the real rate and *i* is the inflation rate:

Factors Influencing Rates

- Supply
  - Households
- Demand
  - Businesses
- Government's Net Supply and/or Demand
  - Federal Reserve Actions

Equilibrium Real Rate of Interest

- Determined by:
  - Supply
  - Demand
  - Government actions
  - Expected rate of inflation

$$r = R - i$$

Determination of the Equilibrium Real Rate of Interest

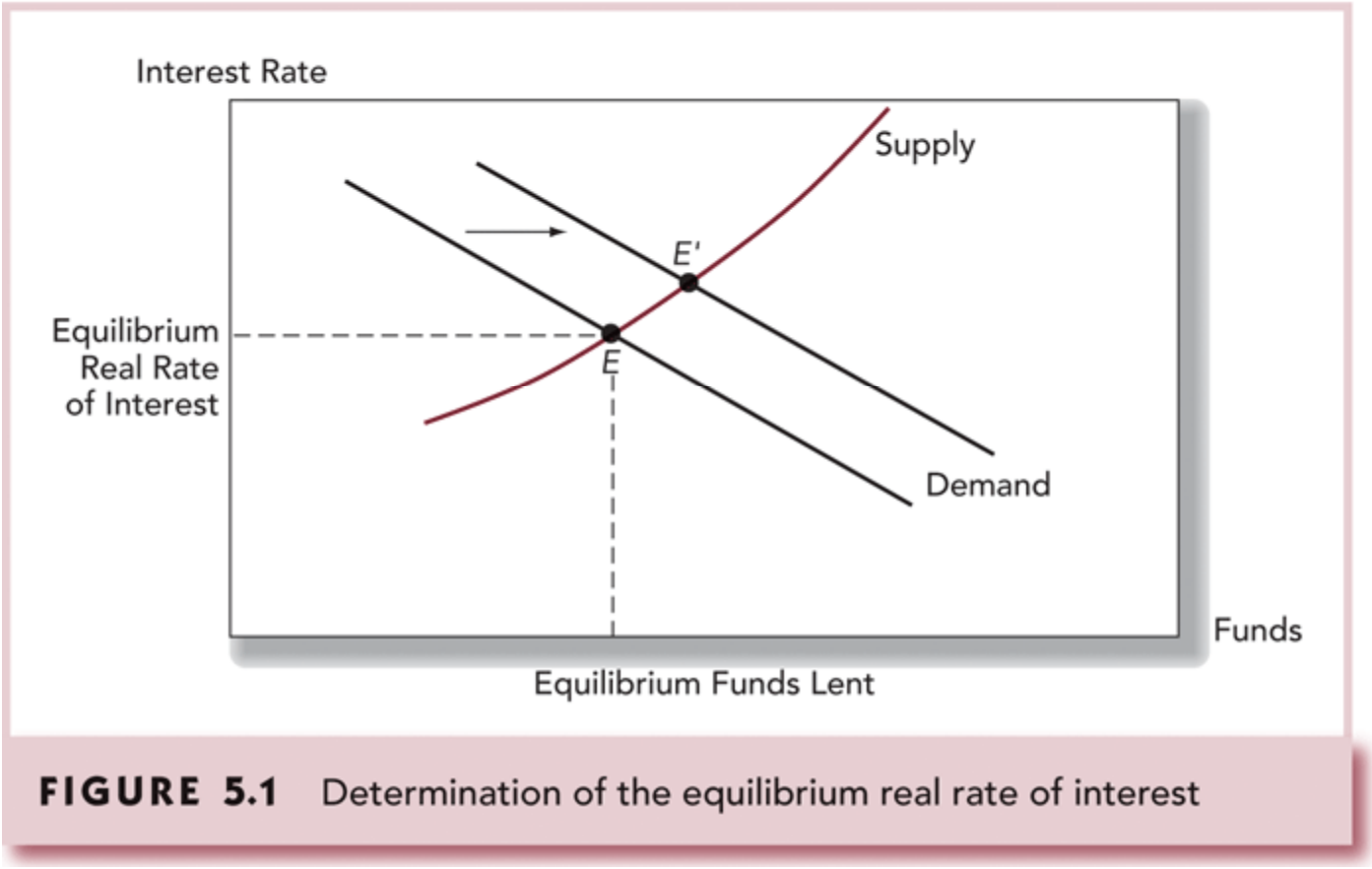


FIGURE 5.1 Determination of the equilibrium real rate of interest

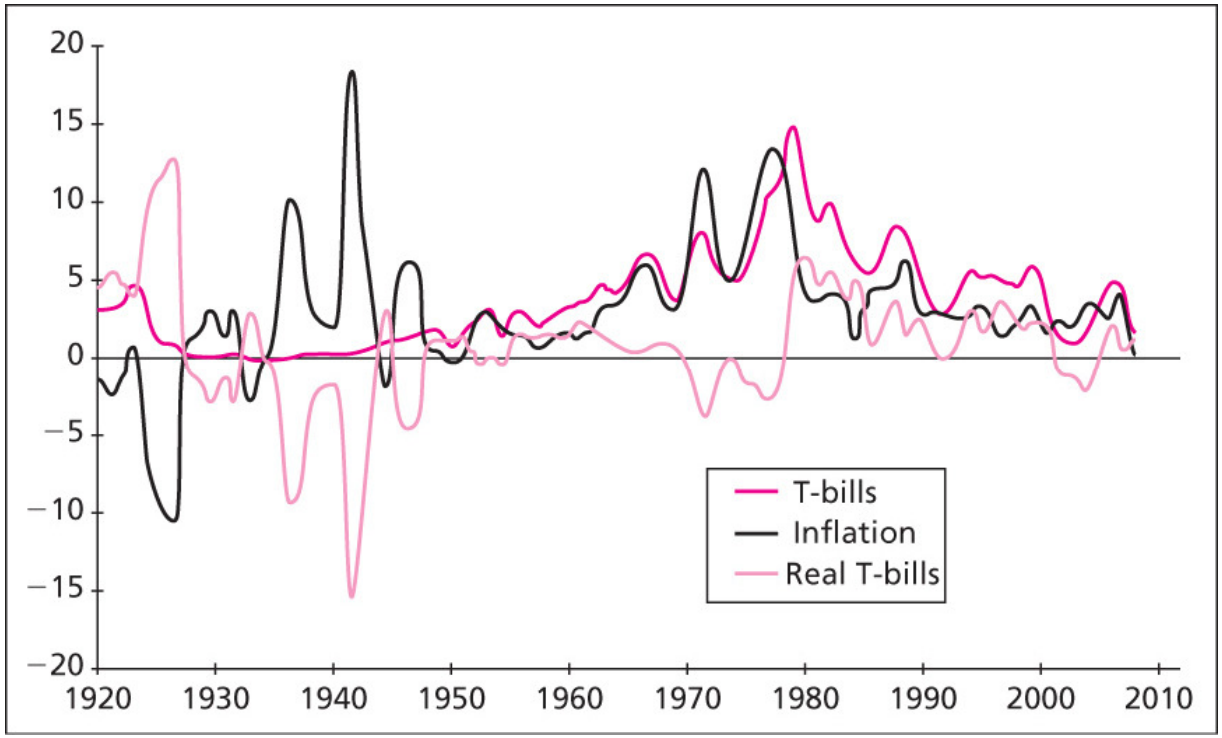
Equilibrium Nominal Rate of Interest

- As the inflation rate increases, investors will demand higher nominal rates of return
- If $E(i)$ denotes current expectations of inflation, then we get the Fisher Equation:

$$R = r + E(i)$$

$$r = R - i$$

Nominal and Real interest rates and Inflation



Taxes and the Real Rate of Interest

- Tax liabilities are based on nominal income
  - Given a tax rate (t), nominal interest rate (R), after-tax interest rate is $R(1-t)$
  - Real after-tax rate is:

$$R(1-t)-i=(r+i)(1-t)-i=r(1-t)-it$$

$$R=r+E(i)$$

$$r=R-i$$