Investment Analysis & Portfolio Management
Chapter 1/2/3/4

Dec/Jan/Feb: Friday 15:00~18:00; 33405
(March 2nd → 3rd : Saturday 09:00~12:00; 33405)
~ March 30th: Friday 09:00~12:00; 33405

MBA Winter2017-2018

Course Outline

- Key Concepts:
  - About "Investment Analysis"
  - Portfolio Theory, CAPM, APT, EMH, OPM, …
  - Common Theme: "Security markets are nearly efficient."
  - Efficient Diversification, Proper Measurement of Risk
  - Risk-Return Trade-off Relationship
  - More "asset allocation" than "security selection"

    - Part 1: Introduction
    - Part 2: **Portfolio Theory & Practice**
    - Part 3: **Equilibrium in Capital Markets**
    - Part 4: Fixed-Income Securities
    - Part 5: **Security Analysis**
    - Part 6: Options, Futures, and Other Derivatives
    - Part 7: **Applied Portfolio Management**

Chapter 1: The Investment Environment

- **Real vs Financial Asset**
  - Financial Asset
  - Informational Role
  - Consumption Timing
  - Allocation of Risk
  - Separation of Ownership & Mgmt
    - Agency Problem
    - Stock Option
    - Takeover & Proxy Contest
  - Corporate Governance & Ethics
    - WorldCom, Enron
- **Investment Process**
  - Asset Allocation:
    - Safe Asset
    - Risky Asset
  - Security Selection
    - Top-down
    - Bottom-up
  - Security Analysis
- **Competitive Markets**
  - Risk-Return Trade-off
  - Efficient Markets
    - Passive vs Active Mgmt
- **The Players**
  - Financial Intermediaries
  - Investment Companies
  - Investment Bankers
    - underwriters
- **Financial Crisis of 2008**
  - Housing Finance
  - Mortgage Derivatives
  - Credit Default Swaps
  - Systemic Risk
  - …

The Investment Process

- "Top-down" approach
  - Asset allocation followed by *security analysis* to evaluate which particular securities to be included in the portfolio
- "Bottom-up" approach
  - Investment based solely on the price-attractiveness, which may result in unintended heavy weight of a portfolio in only one or another sector of the economy

Markets Are Competitive

- Risk-Return Trade-Off
  - Higher-risk assets are priced to offer higher expected returns than lower-risk assets
- Efficient Markets
  - In fully efficient markets when prices quickly adjust to all relevant information, there should be neither underpriced nor overpriced securities
- Passive Management
  - Holding a highly diversified portfolio
  - No attempt to find undervalued securities
  - No attempt to time the market
- Active Management
  - Finding mispriced securities
  - Timing the market

Universal Bank Activities

Investment Banking

- Underwrite new securities issues
- Sell newly issued securities to public in the *primary ma rket*
- Investors trade previously issued securities among themselves in the *secondary markets*

Commercial Banking

- Take deposits
- make loans

Financial Crisis of 2008

- Antecedents of the Crisis:
  - "The Great Moderation": A time in which the U.S. had a stable economy with low interest r ates and a tame business cycle with only mild recessions
  - Historic boom in housing market

Figure 1.1 Short-Term LIBOR and Treasury-Bill Rates and the TED Spread

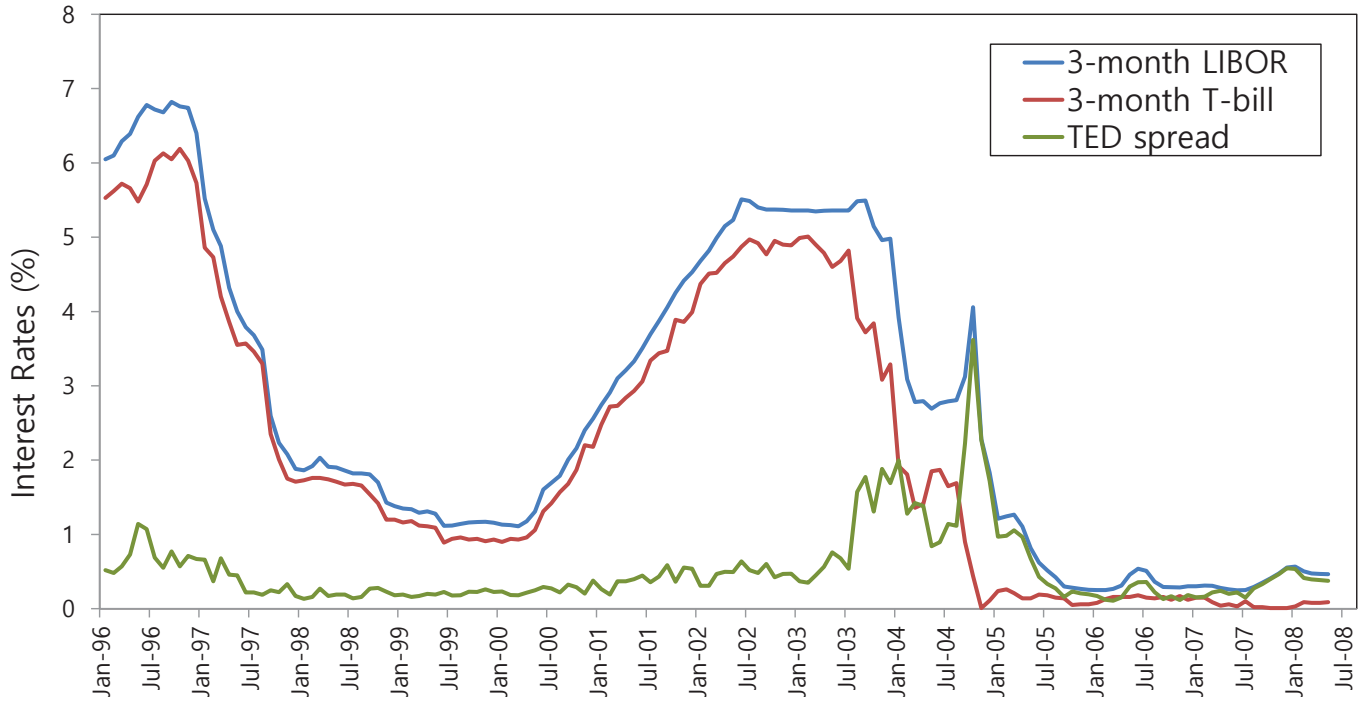


Figure 1.1-1 Short-Term LIBOR and Treasury-Bill Rates and the TED Spread

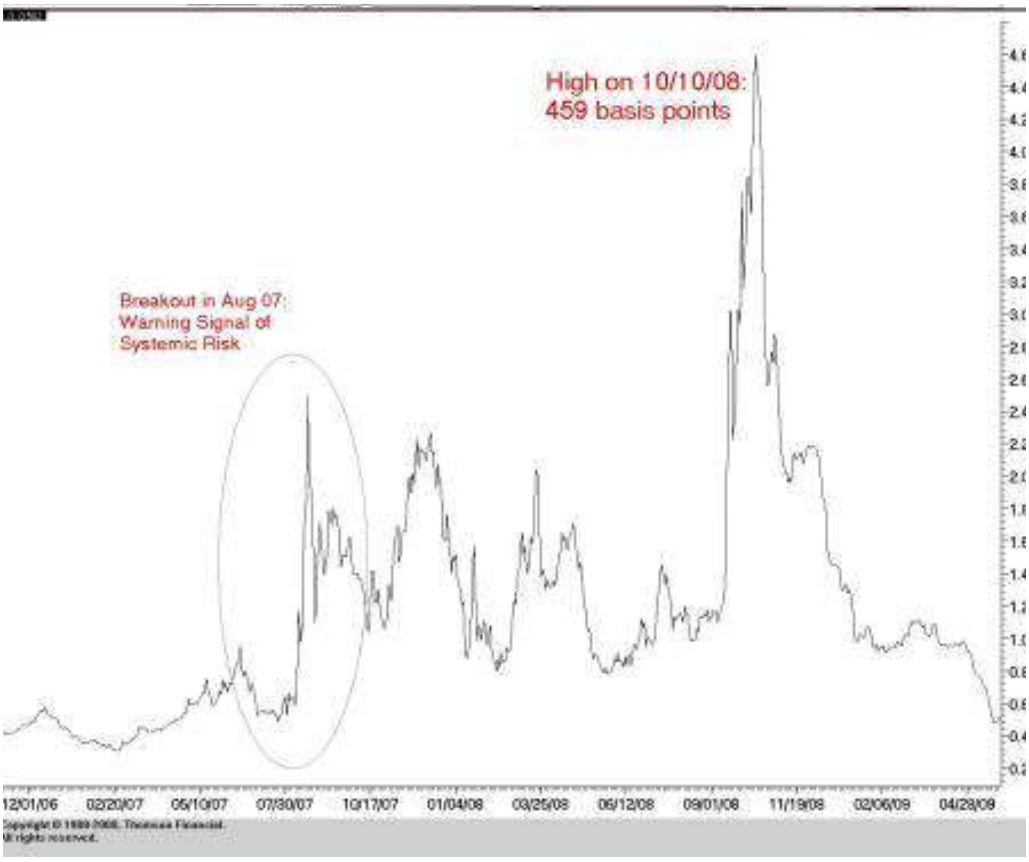
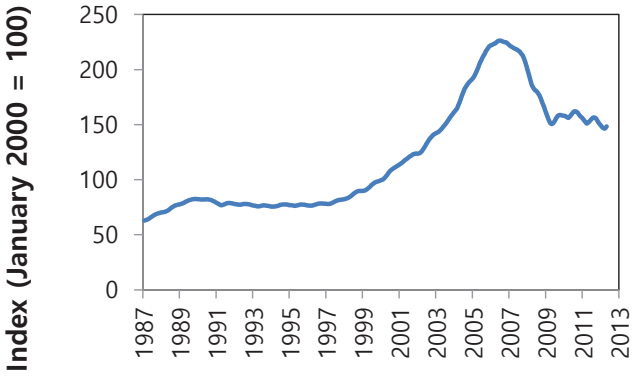
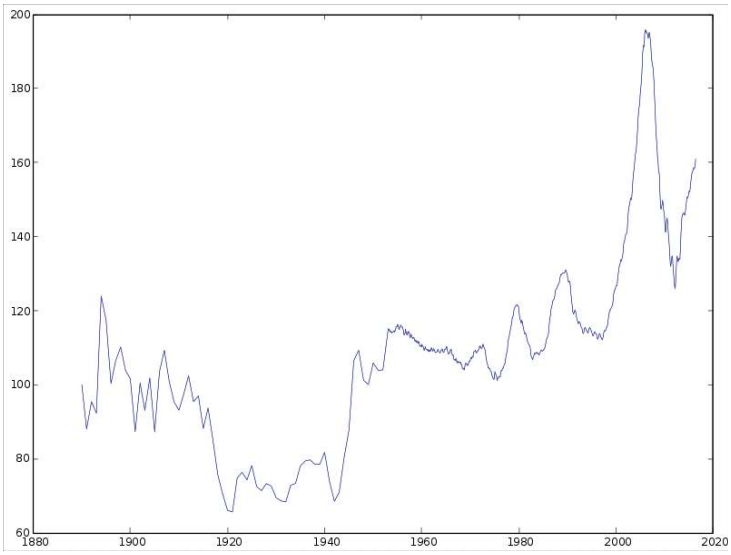


Figure 1.3 The Case-Shiller Index of U.S. Housing Prices

Case–Shiller home price index data, 1987–2013

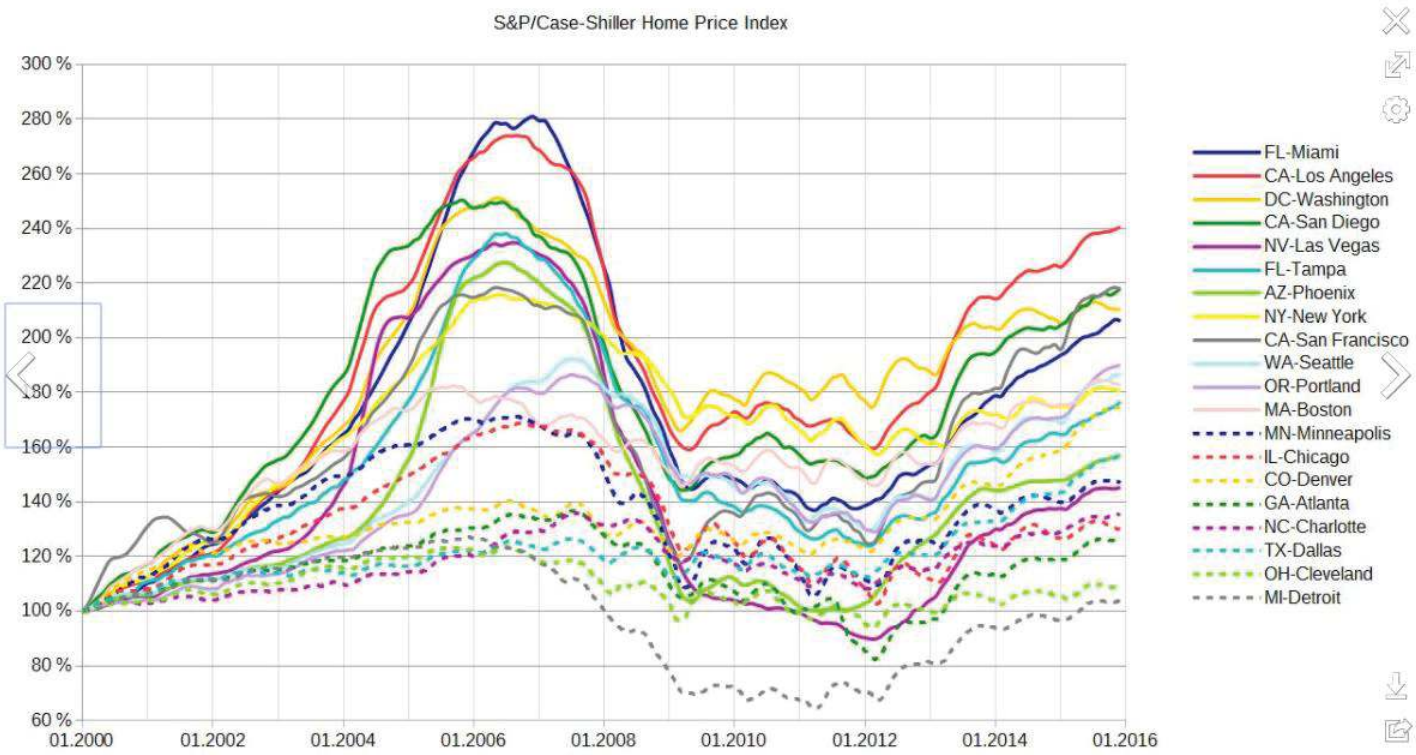


Case–Shiller home price index data, 1890–2016



(1890 = 100)

Figure 1.3-1 The Case-Shiller Index of U.S. Housing Prices: 2000-2016



Changes in Housing Finance

Old Way

- Local thrift institution made mortgage loans to homeowners
- Thrift' s major asset: A portfolio of long-term mortgage loans
- Thrift's main liability: Deposits
- "Originate to hold"

New Way

- **Securitization**: Fannie Mae and Freddie Mac bought mortgage loans and bundled them into large pools
- Mortgage-backed securities are tradable claims against the underlying mortgage pool
- "Originate to **distribute**"

Changes in Housing Finance

- Securitization: Buying mortgage loans from originators and bundling them into mortgage-backed securities
- Replacement of low-risk *conforming* mortgages with *non conforming* "subprime" loans
- Trend toward low-documentation and then no-document ation loans and rising allowed leverage on home loans
  (LTV: loan-to-value ratio)
- Low adjustable-rate mortgages (ARMs) that "maxed out" borrowers' paying capacity at low rates

Mortgage-Backed Securities

- Pass-throughs
  - Homeowners: repay Principal & Interest on the 30-year loan
  - Originators: collect servicing fee
  - Agencies: collect guarantee fee
  - Investors: receive the remainder

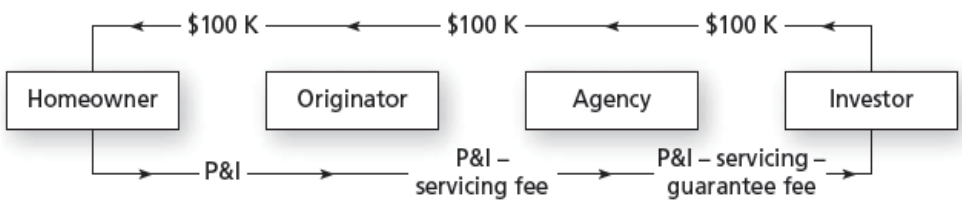


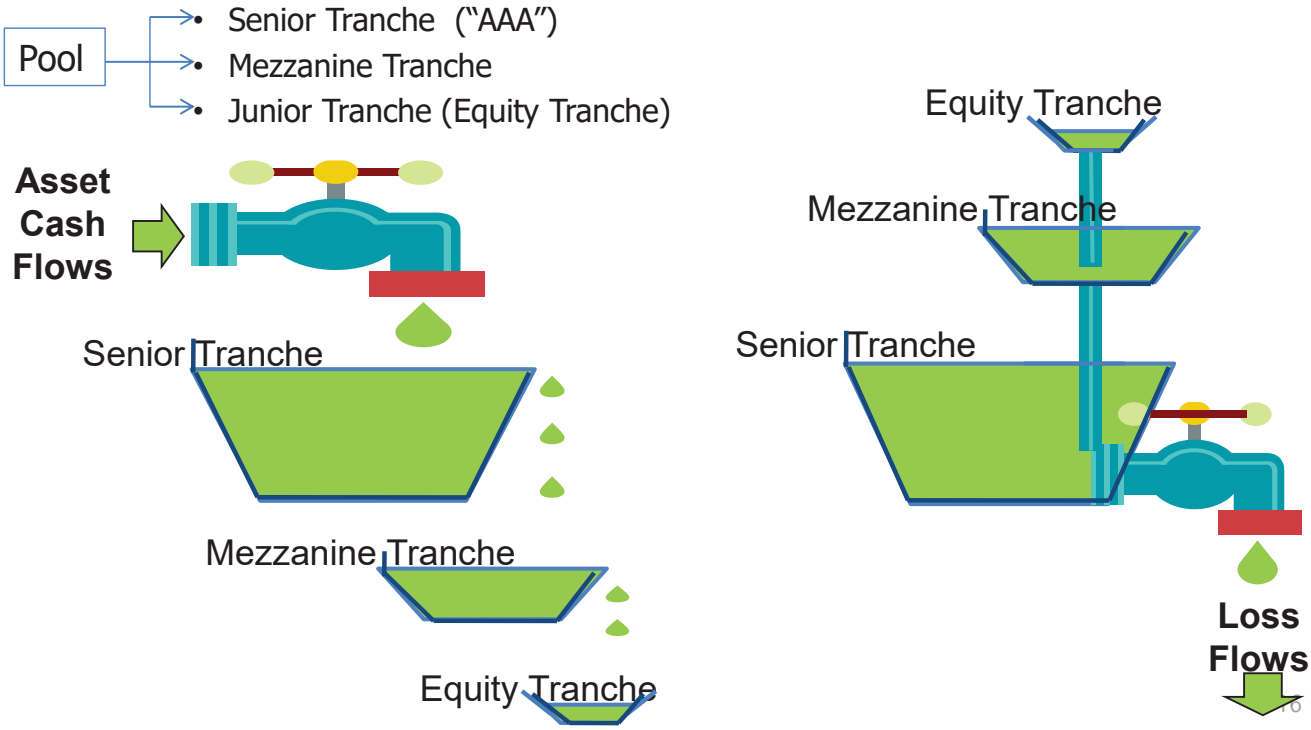
Figure 1.4 Cash flows in a mortgage pass-through security

Mortgage Derivatives

- Collateralized debt obligations (CDOs)
  - Mortgage pool divided into slices or *tranches* to concentrate default risk
    - Senior tranches: Lower risk, highest rating (AAA)
    - Junior tranches: High risk, low or junk rating
  - Estimated ratings significantly underestimated the inherent risk

Collateralized Mortgage Obligations

- CMOs & CDOs (Collateralized Debt Obligations)
  - Prioritize Claims to a pool of MBSs

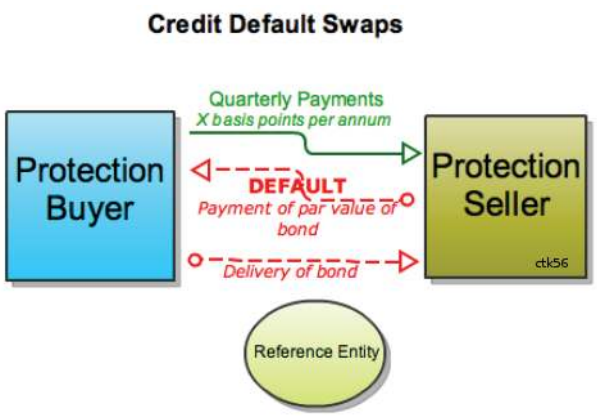


Why Was Credit Risk Underestimated?

- Default probabilities were estimated on the historical data covering the rising housing market
- Geographic diversification did not reduce risk as much as anticipated
- Agency problems with rating agencies

Credit Default Swap (CDS)

- A CDS is an insurance contract against the default of the borrower
  - Investors bought sub-prime loans and used CDSs to insure their safety
  - Some big swap issuers did not have enough capital to back their CDSs when the market collapsed resulting in the failure of CDO insurance



Rise of Systemic Risk

- Systemic Risk**:** A potential breakdown of the financial system in which problems in one market spill over and disrupt others.
  - **One default** may set off a chain of further defaults.
  - Waves of selling may occur in a **downward spiral** as asset prices dro p.
  - Potential contagion from institution to institution, and from market to market.
- Banks had a **mismatch** between the maturity and liquidity of their assets and liabilities - Liabilities were short and liquid, while assets were long and illiquid - Constant need to refinance the asset portfolio.
- Banks were very **highly levered**, giving them almost no margin of safety.
- Investors relied too much on credit enhancement through structured products like **CDS**.
- CDS traded mostly over-the-counter, with no posted margin requirements and little transparency.
- **Opaque linkages** between financial instruments and institutions.

The Shoe Drops

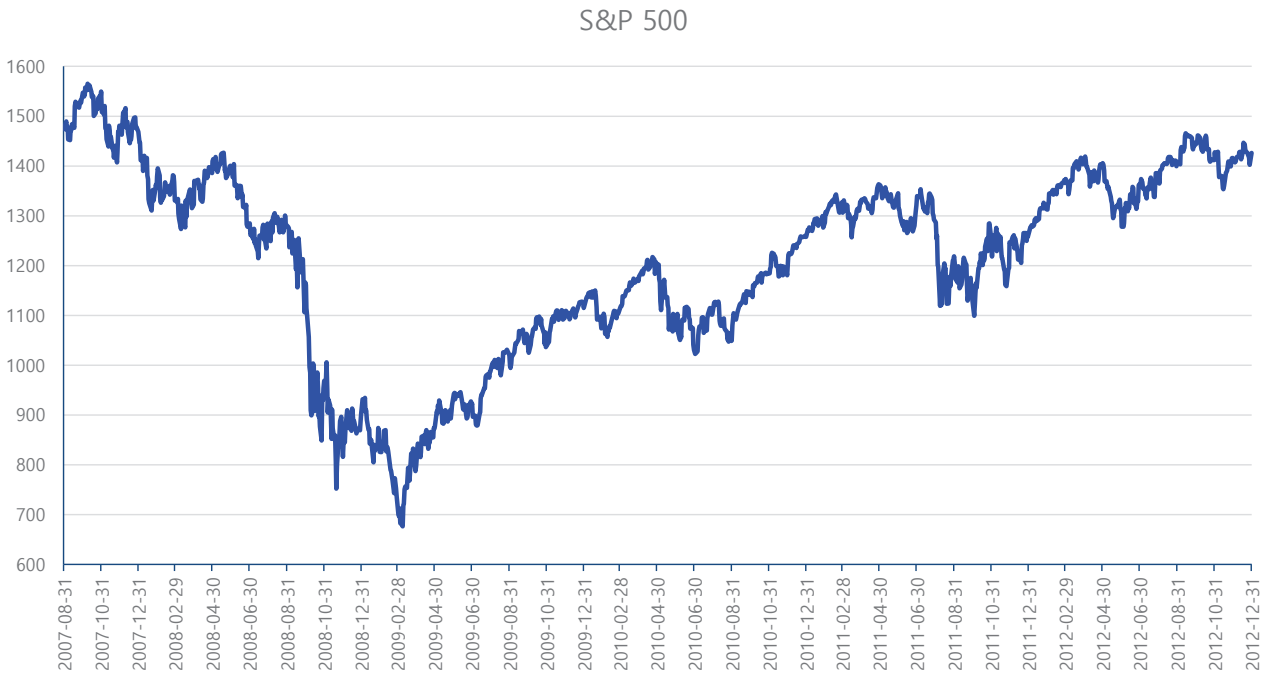
- 2000-2006: Sharp increase in housing prices caused many investors to believe that continually rising home prices would bail out poorly performing loans
- **2004**: **Interest rates began rising…**
- 2006: Home prices peaked
- 2007: Housing defaults and losses on mortgage-backed securities surged
- 2008: Troubled firms include Bear Stearns, Fannie Mae, Freddie Mac, Merrill Lynch, Lehman Brothers, and AIG
  - Money market breaks down
  - Credit markets freeze up
  - Federal bailout to stabilize financial system

2004: Interest rates began rising…

2004: GDP = 3.8%, Unemployment = 6%, Inflation = 3.3%

- Fed Fund target rate has been raised to cool housing market bubble.
- Home sales began to fall in Sept 2007.

S&P500 Index



The Dodd-Frank Reform Act

- Mechanisms to mitigate systemic risk
  - **Stricter rules** for bank capital, liquidity, and risk management practices
  - Increased transparency, especially in derivatives markets (eg.: standardize CDS contracts so they can trade in centralized exchanges)
  - **Office of Credit Ratings** within the SEC to oversee the credit rating agencies
    - **Central Clearing** of OTC derivatives
    - **Swap Execution Facilities**: centralized exchanges for swap
    - **Trade Repositories**: to report/record OTC transactions
    - **Volcker rule**: to limit bank's proprietary trading

Chapter 2: Asset Classes and Financial Instruments

- **Money Market**
  - Treasury Bills
  - Time Deposits
  - Commercial Paper
  - Bankers' Acceptance
  - Eurodollars
  - Repos & Reverse-Repos
  - Federal Funds
  - Brokers' Calls
  - LIBOR market
- **Bond Market**
  - T-Notes & Bonds
  - TIPS (cf. IIGB)
  - Federal Agency Debt
  - International Bonds
  - Municipal Bonds
  - Corporate Bonds
  - Mortgages & **MBS**

- **Equity Market**
  - Common Stock
    - Residual Claim
    - Limited Liability
  - Preferred Stock
  - Depository Receipts (DRs)
  - Stock Market Indexes
    - DJA
    - S&P500
    - Equally Weighted Indexes
- **Derivative Markets**
  - Options
  - Futures Contracts
  - Swaps

Fundamental Dichotomy

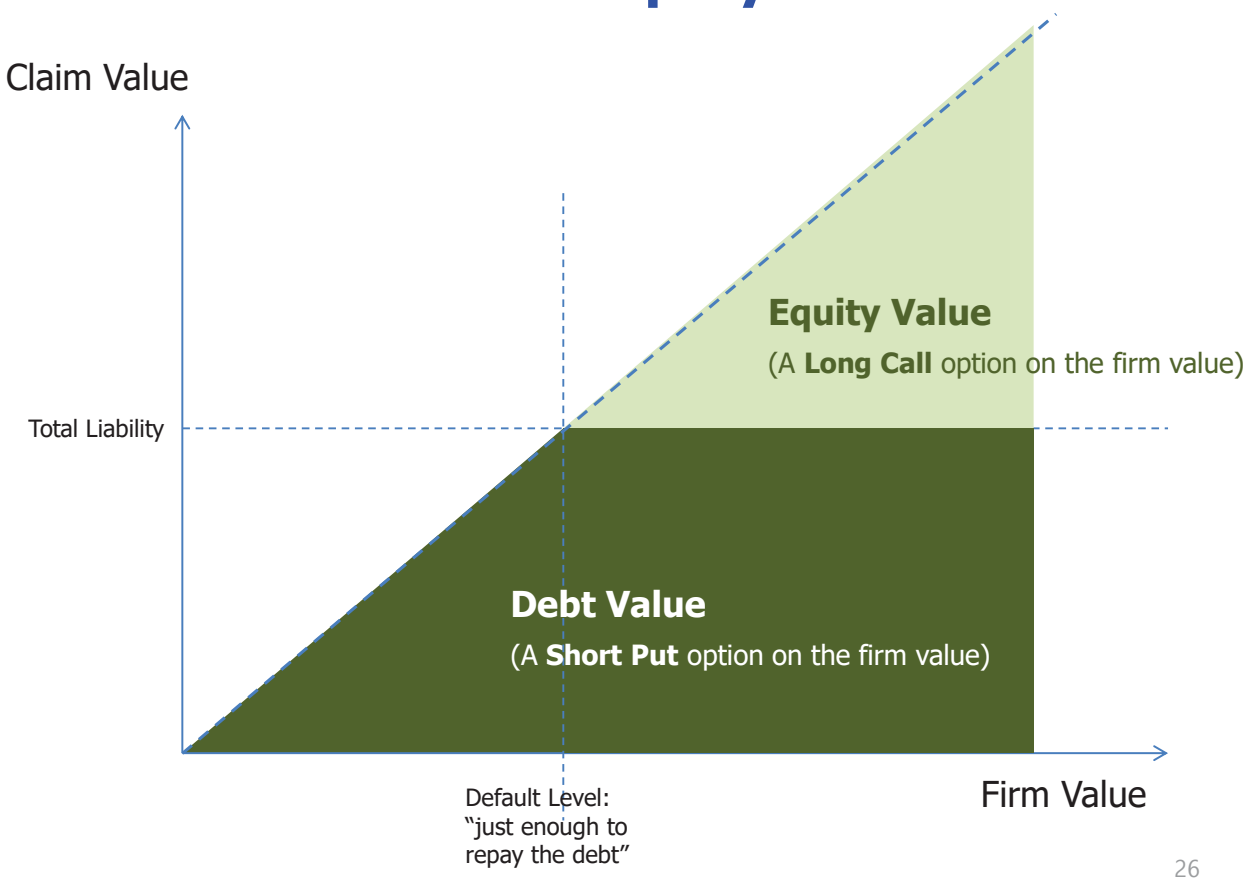
Debt & Equity: Bond & Stock

- **Debt**(Loan, Bond, etc.):
  - Fixed Liability, Principal & Interest Payment Guaranteed
  - Failure to a timely and full repayment means the default
  - First Priority in repayment: Senior claim
  - No voting rights, No participation in management decisions

- **Equity**(Stock):
  - Profit Participation through dividend payment
  - Limited Liability
  - Residual Claim: paid only after the full repayment of the debt
  - Unlimited Upside potential: over the liability
  - Exercise voting rights at the shareholders' meeting

Fundamental Dichotomy:

Debt & Equity



The **Limited Liability** and Capitalism

- **Limited liability**
  - is where a person's financial liability is limited to a fixed sum, the value of a person's investment in a company or partnership.
  - cf. Unlimited liability: sole proprietors and partners in general partnerships are each liable for all the debts of the business.
- History
  - The world's first modern limited liability law was enacted by the state of New York in 1811.
  - In England, Limited Liability Act 1855.
  - In France and in the majority of the U.S. states by 1860.

A Hybrid of **Debt & Equity**

- Preferred Stock
  - Paid stable dividends before common stockholders
  - No voting rights
- Convertible Bond
  - Investors can choose to convert debt to equity
  - Pre-fixed conversion ratio
- Hybrid Security
  - e.g. Convertible & Redeemable Preferred Stock
- Subordinated Debt
  - Last priority of repayment, just before preferred and common stockholders
- Islamic Bond (Sukuk, originated from "check", Shariah Compliant)
  - Fractional ownership of the underlying real asset, rent-sharing
  - Principal protection through the issuer's repurchase promise

Table 2.1 Major Components of the Money Market

	$ Billion
Repurchase agreements	$1,141
Small-denomination time deposits and savings deposits*	7,202
Large-denomination time deposits*	1,603
Treasury bills	1,478
Commercial paper	1,445
Money market mutual funds	2,645

*Small denominations are less than $100,000.
Sources: *Economic Report of the President,* U.S. Government Printing Office, 2012; *Flow of Funds Accounts of the United States,* Board of Governors of the Federal Reserve System, September 2012.

Table 2.1

Major components of the money market

Bond Market Securities

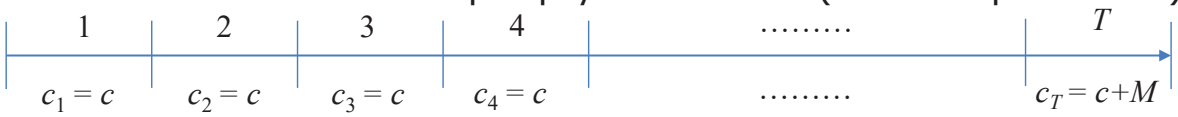
- Treasury Notes and Bonds
  - Maturities
    - Notes – Maturities up to 10 years
    - Bonds – Maturities from 10 to 30 years
  - Par Value - $1,000
  - Interest paid semiannually
  - Quotes – Percentage of par
- Corporate Bonds
  - Issued by private firms
  - Semi-annual interest payments
  - Subject to larger default risk than govt securities
  - Options in corporate bonds
    - Callable
    - Convertible

Bond Market Securities

- Mortgage-Backed Securities
  - Proportional ownership of a mortgage pool or a specif ied obligation secured by a pool
  - Produced by securitizing mortgages
    - Mortgage-backed securities are called *pass-throughs* because the cash flows produced by homeowners paying off their mortgages are passed through to investors.
  - Most were issued by Fannie Mae and Freddie Mac
  - Traditionally, were comprised of *conforming mortgages*, which met standards of credit worthiness
  - Later on, "Private-label" issuers securitized large amounts of *sub prime mortgages*, made to financially weak borrowers
  - Fannie and Freddie were allowed and even encouraged to buy subprime mortgage securities

Bond Pricing

- Present Value of future coupon payment stream: (M = Principal amount)



$$P_0 = \frac{c_1}{1+r_1} + \frac{c_2}{(1+r_2)^2} + \frac{c_3}{(1+r_3)^3} + \cdots \frac{c_T}{(1+r_T)^T} = \sum_{t=1}^{T} \frac{c_t}{(1+r_t)^t}$$

- Coupon payments of a bond usually remain unchanged until the maturity date.

$$c_t = c \quad for \quad t = 1,2,...T \quad \rightarrow \quad P_0 = \sum_{t=1}^{T} \frac{c}{(1+r_t)^t} + \frac{M}{(1+r_T)^T}$$

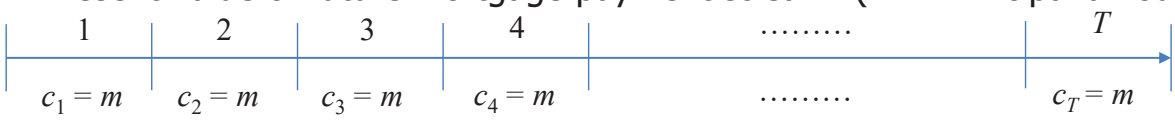
$$If \quad r_t = r \quad for \quad t = 1,2,...T \quad \rightarrow \quad P_0 = \sum_{t=1}^{T} \frac{c}{(1+r)^t} + \frac{M}{(1+r)^T}$$

- With continuous compounding:

$$P_0 = c_1 e^{-r_1 \Delta t} + c_2 e^{-r_2 \Delta t} + c_3 e^{-r_3 \Delta t} + \cdots c_T e^{-r_T \Delta t} = \sum_{t=1}^{T} c_t e^{-r_t \Delta t} \quad \rightarrow \quad \sum_{t=1}^{T} c e^{-r_t \Delta t} + M e^{-r_T \Delta t}$$

Mortgage

- Present Value of future mortgage payment stream: (M = Principal amount)



$$M = \frac{c_1}{1+r_1} + \frac{c_2}{(1+r_2)^2} + \frac{c_3}{(1+r_3)^3} + \cdots \frac{c_T}{(1+r_T)^T} = \sum_{t=1}^{T} \frac{m}{(1+r_t)^t}$$

$$If \quad r_t = r \quad for \quad t = 1,2,...T \quad \rightarrow \quad M = \sum_{t=1}^{T} \frac{m}{(1+r)^t} \quad and \quad (1+r)M = \sum_{t=1}^{T} \frac{m}{(1+r)^{t-1}}$$

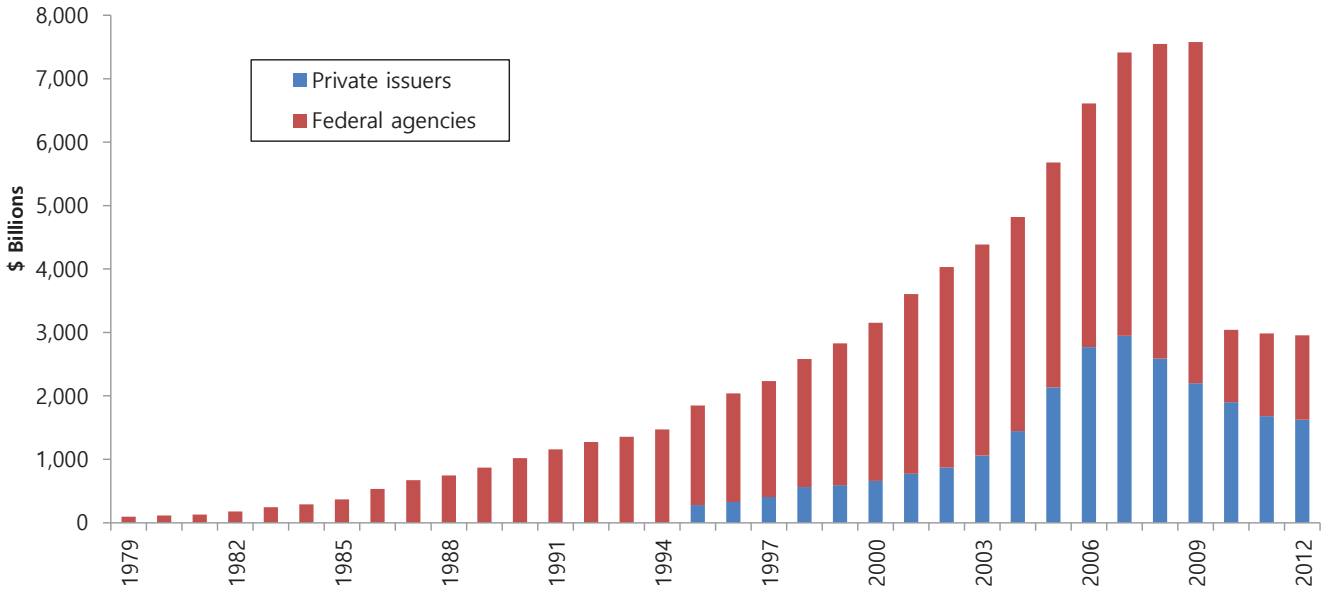
$$(1+r)M - M = \sum_{t=1}^{T} \left(\frac{m}{(1+r)^{t-1}} - \frac{m}{(1+r)^t} \right)$$

$$= \frac{m}{(1+r)^0} - \frac{m}{(1+r)^1} + \frac{m}{(1+r)^1} - \frac{m}{(1+r)^2} + \frac{m}{(1+r)^2} - \frac{m}{(1+r)^3} \cdots \frac{m}{(1+r)^{T-1}} - \frac{m}{(1+r)^T}$$

$$rM = m - \frac{m}{(1+r)^T} = m\frac{(1+r)^T - 1}{(1+r)^T} \quad \rightarrow \quad m = rM\frac{(1+r)^T}{(1+r)^T - 1}$$

Loan = 500 million KRW
20-year = 240 months
3.6% p.a. = 0.3% per month
Monthly = 3.24 million KRW

Figure 2.6 Mortgage-Backed Securities Outstanding



Equity Securities

- Common stock: Ownership
  - Residual claim
  - Limited liability
- Preferred stock: Perpetuity
  - Fixed dividends
  - Priority over common
  - Tax treatment
- American Depository Receipts
  - Certificates traded in U.S. markets that represent own ership in shares of a foreign company

Stock Market Indexes

- Dow Jones Industrial Average
  - Includes 30 large blue-chip corporations
  - Computed since 1896
  - Price-weighted average

Example 2.2 Price-Weighted Average

Portfolio: Initial value $25 + $100 = $125
Final value $30 + $90 = $120
Percentage change in portfolio value
= 5/125 = -.04 = -4%
Index: Initial index value (25+100)/2 = 62.5
Final index value (30 + 90)/2 = 60
Percentage change in index -2.5/62.5
= -.04 = -4%

+20%*(1/5) – 10%*(4/5) = – 4%

- Price-weighted index:
  - apply equal # of shares (e.g.1 share)
- MV-weighted index:
  - apply # of shares outstanding
- Equal-weighted index:
  - apply equal amount of dollars invested in each stock

Stock Market Indexes

- Standard & Poor's 500
  - Broadly based index of 500 firms
  - Market-value-weighted index
- Investors can base their portfolios on an index
  - Buy an index mutual fund
  - Buy exchange traded funds (**ETF**s)

U.S. Indexes

- NYSE Composite
- NASDAQ Composite
- Wilshire 5000

Foreign Indexes

- Nikkei (Japan)
- FTSE (U.K.; pronounced "footsie")
- DAX (Germany),
- Hang Seng (Hong Kong)
- TSX (Canada)

Derivatives Markets

- A derivative is a security that gets its value from the valu es of another asset, such as commodity prices, bond and stock prices, or market index values
- **Options**
  - Call: Right to buy underlying asset at the strike or exercise price
    - Value of calls decreases as strike price increases
    - Call option's payoff = $\mathbf{max}(S_T - K, 0)$
  - Put: Right to sell underlying asset at the strike or exercise price
    - Value of puts increase with strike price
    - Put option's payoff = $\mathbf{max}(K - S_T, 0)$
  - Value of both calls and puts increases with time until expiration

Derivatives Markets

- **Futures** Contracts
  - An agreement made today regarding the delivery of an asset (or in some cases, its cash value) at a specified delivery or maturity date for an agreed-upon price, called the futures price, to be paid at contract maturity
  - Long position: Take delivery at maturity
  - Short position: Make delivery at maturity

- Rate of Return: $= \dfrac{F_0 - S_0}{S_0} = r \quad (Riskfree\ rate)$

$$F_0 = S_0(1+r)$$

Comparison

Option

- Right, but not obligation, to buy or sell; option is exercised only when it is profitable
- Options must be purchased
- The premium is the price of the option itself.

Futures Contract

- Obliged to make or take delivery;
  long position must buy at the futures price,
  short position must sell at futures price
- Futures contracts are entered into without cost

Chapter 3: How Securities are Traded

- **Issuance**
  - Investment Banking
  - Shelf Registration
  - Private Placement
  - IPO
- **How Securities are Traded**
  - Types of Markets
    - Direct Search
    - Brokered Markets
    - Dealer Markets
    - Auction Markets
  - Types of Orders
    - Market Orders
    - Price-Contingent Orders
      - Limit Orders
      - Stop Orders

- **Trading Mechanism**
  - ECNs
  - Specialist Markets
- **US Securities Markets**
  - NASDAQ
  - NYSE
  - NMS
- Trading Costs
- Buying on Margin
- Short Sales
  - Short Squeeze
- Regulation
  - Self-Regulation
  - Sarbanes-Oxley Act
  - Insider Trading

Primary Market & Secondary Market

- Primary Market:
  - is where securities are initially issued to investors
- Secondary Market:
  - allows selling/buying of those securities to the 3rd party
- What if there is no secondary markets?
  - Investors will have to hold the securities until the maturity or liquidation.
  - It increases the risk associated with the investment during the investment period, which, in turn, decreases the incentive to participate in the primary market.
  - e.g. If the divorce is impossible or prohibited by law, …

How Firms Issue Securities

- Privately Held Firms
  - Up to 499 shareholders
    - Middlemen have formed partnerships to buy shares and get a round the 499-investor restrictions
  - Raise funds through private placement
  - Lower liquidity of shares
  - Have fewer obligations to release financial statements and other information
- Publicly Traded Companies
  - Raise capital from a wider range of investors through initial public offering, IPO
    - *Seasoned equity offering*: The sale of additional shares in fir ms that already are publicly traded
  - Public offerings are marketed by investment bankers or *underwriters*
  - Registration must be filed with the SEC

Figure 3.1 Relationship Among a Firm Issuing Securities, the Underwriters, and the Public

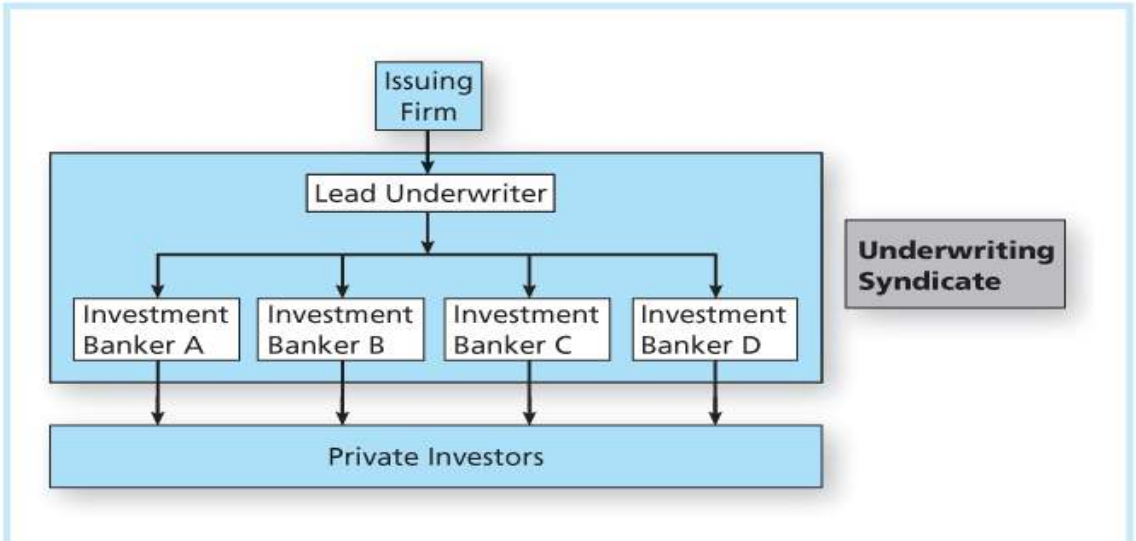


Figure 3.1 Relationship among a firm issuing securities, the underwriters, and the public

underwrite

- sign and accept liability under (an insurance policy), thus guaranteeing payment in case loss or damage occurs.
- (of a bank or other financial institution) pledge to buy all the unsold shares in (an issue of new securities).

underwriting

- Underwriting is the process by which investment bankers raise investment capital from investors on behalf of corporations and governments that are issuing either equity or debt securities.
- The word "underwriter" originally came from the practice of having each risk-taker **write his name under the total amount of risk he was willing to accept** at a specified premium. This centuries-old practice continues, in a way, as new issues are usually brought to market by an **underwriting syndicate**, in which each firm takes the responsibility, as well as the risk, of selling its specific allotment.

How Securities are Traded

Types of Markets:

- Direct search
  - Buyers and sellers seek each other
- Brokered markets
  - Brokers search out buyers and sellers
- Dealer markets
  - Dealers have inventories of assets from which they buy and sell
- Auction markets
  - Traders converge at one place to trade

Bid and Asked Prices

Bid Price

- Bids are offers to buy.
- In dealer markets, the bid price is the price at which the dealer is willing to buy.
- Investors "sell to the bid."
- **Bid-asked spread** is the profit for making a market in a security.

Ask Price

- Asked prices represent offers to sell.
- In dealer markets, the asked price is the price at which the dealer is willing to sell.
- Investors must pay the asked price to buy the security.

Types of Orders

- Market Order:
  - Executed immediately
  - Trader receives current market price
- Price-Contingent Order:
  - Traders specify buying or selling price
- A large order may be filled at multiple prices

Action	Condition: Price below the Limit	Condition: Price above the Limit
Buy	Limit-Buy Order	Stop-Buy Order
Sell	Stop-Loss Order	Limit-Sell Order

Figure 3.5 Price-contingent orders

50	103	
80	102	
105	101	
120	100	
	99	**100**
	98	**85**
	97	**75**
	96	**60**
355		320

Appendix: Market Orders

- A Buys 10 shares at Market → Bought 10 at $100/shr "**$100**"
- B Sells 10 shares at Market → Sold 10 at $99/shr "**$99**"

50	$103	
80	$102	
105	$101	
120	$100	
	$99	**100**
	$98	**85**
	$97	**75**
	$96	**60**

50	$103	
80	$102	
105	$101	
110	$100	
	$99	**90**
	$98	**85**
	$97	**75**
	$96	**60**

Appendix: Limit Orders

- A Buys 10 shares at $99/shr → "willing to wait"
- B Buys 10 shares at $100/shr → Bought 10 at $100/shr "**$100**"
- C Buys 10 shares at $**101**/shr → Bought 10 at $**100**/shr "**$100**"
- D Sells 10 shares at $99/shr → Sold 10 at $99/shr "**$99**"
- E Sells 10 shares at $100/shr → "willing to wait"
- F Sells 10 shares at $**98**/shr → Sold 10 at $**99**/shr "**$99**"

50	$103	
80	$102	
105	$101	
120	$100	
	$99	**100**
	$98	**85**
	$97	**75**
	$96	**60**

50	$103	
80	$102	
105	$101	
110	$100	
	$99	**90**
	$98	**85**
	$97	**75**
	$96	**60**

Appendix: Stop Loss Orders

- A bought 10 shares at $**110**/shr
- A places a stop loss order for 10 shares (to be triggered) at $100/shr
- When current price reaches "**$100**", the order is placed (activated):
  - Sell 10 shares at market (**market order**)

50	$103	
80	$102	
105	$101	
120	$100	
	$99	**100**
	$98	**85**
	$97	**75**
	$96	**60**

→ Sold 10 at $**99**/shr

150	$100	
180	$99	
200	$98	
300	$97	
	$95	**10**
	$93	**20**
	$90	**30**
	$89	**50**

→ Sold 10 at $**95**/shr

Appendix: Stop Loss Orders

- A bought 10 shares at $**110**/shr
- A places a stop loss order for 10 shares (to be triggered) at $100/shr
- When current price reaches "**$100**", the order is placed (activated):
  - Sell 10 shares at $**99**/shr (**limit order**)

50	$103	
80	$102	
105	$101	
120	$100	
	$99	**100**
	$98	**85**
	$97	**75**
	$96	**60**

→ Sold 10 at $**99**/shr

150	$100	
180 → 190	$99	
200	$98	
300	$97	
	$95	**10**
	$93	**20**
	$90	**30**
	$89	**50**

→ Unfilled: left outstanding
i.e. **open to Downside Risk**

New Trading Strategies

- Algorithmic Trading
  - The use of computer programs to make trading decisi ons
- High-Frequency Trading
  - Special class of algorithmic with very short order exec ution time
- Dark Pools
  - Trading venues that preserve anonymity, mainly relev ant in block trading

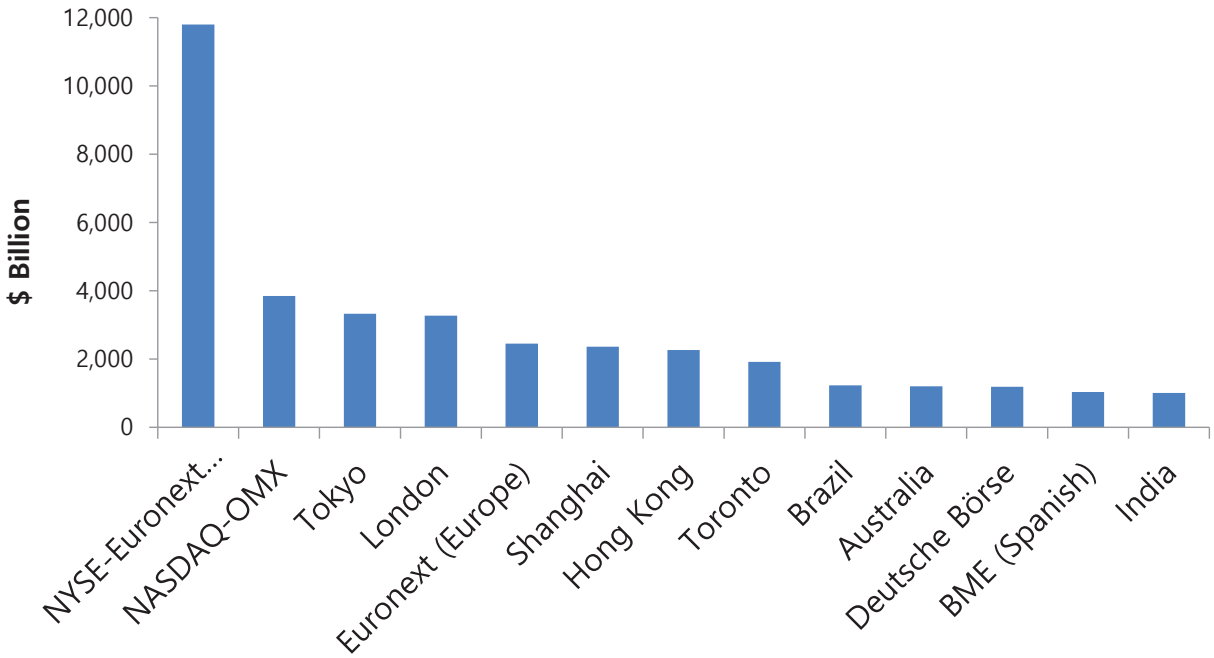
New Trading Strategies

- Bond Trading
  - Most bond trading takes place in the **OTC market** among bond dealers
  - NYSE Bonds is the largest centralized bond market of any U.S. exchange
  - Market for many bond issues is "thin" and is subject to liquidity risk

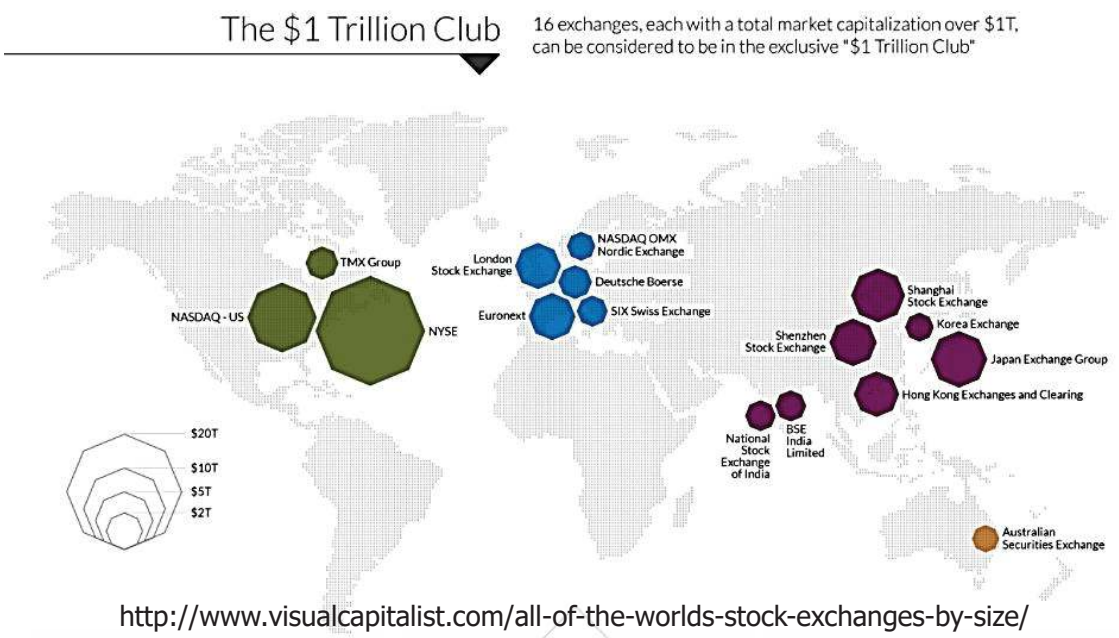
Globalization of Stock Markets

- Widespread trend to form international and local alliances and mergers
  - NYSE acquired Archipelago (ECN), American Stock Ex change, and merged with Euronext
  - NASDAQ acquired Instinet/INET (ECN), Boston Stock Exchange, and merged with OMX to form NASDAQ O MX Group
  - Chicago Mercantile Exchange acquired Chicago Board of Trade and New York Mercantile Exchange

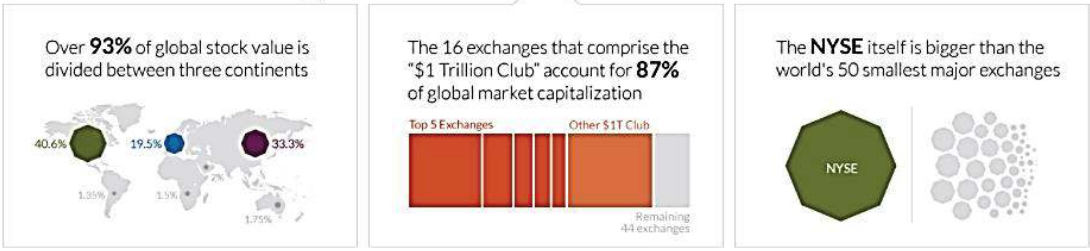
Figure 3.8 The Biggest Stock Markets in the World by Domestic Market Capitalization



There are **60** major stock exchanges in the world with a total value of **$69 trillion**



http://www.visualcapitalist.com/all-of-the-worlds-stock-exchanges-by-size/



Trading Costs

- Brokerage Commission:
  - Fee paid to broker for making the transaction
  - Explicit cost of trading
  - Full service vs. discount brokerage
- Spread:
  - Difference between the bid and asked prices
  - Implicit cost of trading

Buying on Margin

- Borrowing part of the total purchase price of a position using a loan from a broker
- Investor contributes the remaining portion
- **Margin** refers to the percentage or amount contributed by the investor
- You profit when the stock rises

- Initial margin is set by the Fed
  - Currently 50%
- Maintenance margin
  - Minimum equity that must be kept in the margin account
  - **Margin call** is issued if value of securities falls too much

Example 3.1 Margin Trading

Share price $100
60%: **Initial Margin** (= Equity/Asset)
40%: **Maintenance Margin** (= Equity/Asset)
100 Shares Purchased
Initial Position

Stock	$10,000	Borrowed	$4,000
		Equity	$6,000

Stock price falls to $70 per share
New Position

Stock	$7,000	Borrowed	$4,000
		Equity	$3,000

Margin% = $3,000/$7,000 = 43%

Example 3.2
Margin Trading: Maintenance Margin

How far can the stock price fall before a margin call?

Let maintenance margin = **40%**

Equity = $100P$ - \$4000
Percentage margin = $(100P$ - \$4,000$)/100P$
$(100P$ - \$4,000$)/100P = \mathbf{0.40}$

Solve to find: P = **\$66.67**

Short Sales

- *Purpose*
  - To profit from a decline in the price of a stock or security
- *Mechanics*
  - Borrow stock through a dealer
  - Sell it and deposit proceeds and margin in an account
  - Closing out the position: Buy the stock and return to the party from which it was borrowed

Leverage & Short-selling: "opposite trades"

Leverage: (borrowed purchase, financed buying)
If you spend all of the given ☐10billion and need to invest more in a certain ETF or option or ELW, you may want to borrow up to a 30% of the net asset value of your portfolio. The borrowing will cost you 3.64% pa or **0.07%** per week.

Short-selling:
If you want to sell an ETF that you do not own, you need to borrow the ETF from elsewhere. Selling the borrowed securities is called "short selling" or "selling it short."

Today
Price of ETF: $100/unit
Borrow 10 units of the ETF
Sell them at $100/unit
Receive Cash of $1,000

1 week later	P/L
Price of ETF: $110/unit	-99.30
Return the 10 units	
Buy back 10 units	-1100.00
Cash + Interest	1000.70

1 week later	P/L
Price of ETF: $80/unit	200.70
Return the 10 units	
Buy back 10 units	-800.00
Cash + Interest	1000.70

Example 3.3 Short Sale: Initial Conditions

Dot Bomb	1000 Shares
$100	Initial Price
50%	**Initial Margin** (= Equity/Liability)
30%	**Maintenance Margin** (= Equity/Liability)
Sale Proceeds	$100,000
Margin & Equity	$50,000
Stock Owed	1000 shares

Dot Bomb falls to $70 per share

Assets

$100,000 (sale proceeds)
$50,000 (initial margin)

Liabilities

$70,000 (to buy shares)

Equity

$80,000

Example 3.3 Short Sale: Margin Call

Profit = Ending equity – Beginning equity

$= \$80{,}000 - \$50{,}000 = \$30{,}000$

= Decline in share price x Number of shares sold short

How much can the stock price rise before a margin call?

$(\$150{,}000^{*} - 1000P)/(1000P) = \mathbf{30\%}$

$P = \$115.38$

* Initial margin plus sale proceeds

cf. $(100\text{P} - \$4{,}000)/100P = \mathbf{0.40}$

Chapter 4: Mutual Funds & Other ICs

- **Types**
  - Unit Investment Trusts
  - Managed Investment Co.
  - REITs
  - **Hedge Funds**
  - Islamic Funds
  - Sovereign Wealth Funds
- **Mutual Funds**
  - Investment Policies
  - How Funds are
- **ETFs**
- Mutual Fund: Performance
- Information

Investment Companies

- Pool funds of individual investors and invest in a wide range of securities or other assets
- Services provided:
  - Record keeping and administration
  - **Diversification and divisibility**
  - **Professional management**
  - Lower transaction costs
- Net Asset Value (NAV) is the value of each share in the investment company
- Calculation:

$$\frac{\text{Market Value of Assets - Liabilities}}{\text{Shares Outstanding}}$$

Table 4.1 U.S. Mutual Funds by Investment Classification

	Assets ($ billion)	% of Total Assets	Number of Funds
Equity funds			
Capital appreciation focus	$ 2,356	20.3%	2,686
World/international	1,359	11.7	1,285
Total return	1,490	12.8	610
Total equity funds	$ 5,205	44.8%	4,581
Bond funds			
Corporate	$ 452	3.9%	252
High yield	212	1.8	179
World	259	2.2	205
Government	261	2.2	246
Strategic income	1,204	10.4	484
Single-state municipal	159	1.4	347
National municipal	338	2.9	216
Total bond funds	$ 2,885	24.8%	1,929
Hybrid (bond/stock) funds	$ 839	7.2%	495
Money market funds			
Taxable	$ 2,400	20.7%	431
Tax-exempt	292	2.5	201
Total money market funds	$ 2,692	23.2%	632
Total	$11,621	100.0%	7,637

Public Funds in Korea

	Assets (KRW billions)	% of Total Assets	Number of Funds
Equity funds	58,724.6	25.1%	1,188
Hybrid (mixed Equity) funds	5,626.0	2.4%	220
Hybrid (mixed Bond) funds	13,708.8	5.9%	611
Bond funds	25,678.9	11.0%	412
Fund of funds	8,449.5	3.6%	469
Short-term money market funds	98,821.2	42.2%	127
Derivative-type funds	17,170.8	7.3%	727
Real-estate funds	1,932.9	0.8%	25
Others	3,849.5	1.6%	39
Total	233,960.3	100.0%	3,818

(Source: **http://freesis.kofia.or.kr/)**

Asset Management Companies

Rank	Firm/company	Country	AUM(US$bn)
1	**BlackRock**	United States	5,689
2	**The Vanguard Group**	United States	3,149
3	**UBS**	Switzerland	2,716
4	**State Street Global Advisors**	United States	2,460
5	**Fidelity Investments**	United States	2,025
6	**Allianz**	Germany	1,949
7	**J.P. Morgan Asset Management**	United States	1,760
8	**BNY Mellon Investment Management**	United States	1,740
9	**PIMCO**	United States	1,590
10	**Crédit Agricole Group**	France	1,527

	AMCs	AUM(Wbn)	
1	**Samsung**	31,002	삼성자산운용
2	**Mirae Asset**	27,166	미래에셋자산운용
3	**KB**	16,468	KB자산운용
4	**Shinhan BNP Paribas**	14,059	신한BNP파리바자산운용
5	**Hana UBS**	12,468	하나UBS자산운용
6	**Korea (Hankook)**	11,166	한국투신운용
7	**Kiwoom**	11,043	키움투자자산운용
8	**Hanhwa**	9,398	한화자산운용
9	**NH Amundi**	7,916	엔에이치아문디자산운용
10	**Shinyoung**	7,072	신영자산운용

Fees and Mutual Fund Returns

$$R = \frac{\text{NAV}_1 - \text{NAV}_0 + \text{Income} + \text{Capital Gain}}{\text{NAV}_0}$$

- **Example:**
  - Initial NAV = $20
  - Income distributions of $.15
  - Capital gain distributions of $.05
  - Ending NAV = $20.10

$$R = \frac{\$20.10 - \$20.00 + \$.15 + \$.05}{\$20.00} = .015 \text{ or } 1.5\%$$

Table 4.2 Impacts of Costs on Investment Performance

Table 4.2

Impact of costs on investment performance

	Cumulative Proceeds (All Dividends Reinvested)		
	Fund A	Fund B	Fund C
Initial investment*	$10,000	$10,000	$ 9,200
5 years	17,234	16,474	15,502
10 years	29,699	27,141	26,123
15 years	51,183	44,713	44,018
20 years	88,206	73,662	74,173

*After front-end load, if any.
Notes:
1. Fund A is no-load with .5% expense ratio.
2. Fund B is no-load with 1.5% expense ratio.
3. Fund C has an 8% load on purchases and a 1% expense ratio.
4. Gross return on all funds is 12% per year before expenses.

Taxation of Mutual Fund Income

- Pass-through status under the U.S. tax code
  - Taxes are paid only by the investor
  - Fund investors do not control the **timing** of the sales of securities from the portfolio
- High portfolio turnover leads to tax inefficiency
  - Average turnover = 60%
  - In Korea…

AMCs	Turnover (%)	Commission rate(bp) paid out
IBK	248	9.61
NH Amundi	229	2.54
Hana UBS	149	11.25
Shinhan BNP Paribas	112	9.5
Kiwoom	73	4.88

Exchange Traded Funds

- Examples: "spiders," "diamonds," and "cubes"
- Potential advantages:
  - Trade continuously like stocks
  - Can be sold short or purchased on margin
  - Lower costs
  - **Tax efficient**
- Potential disadvantages:
  - Prices can depart from NAV
  - Must be purchased from a broker

Figure 4.2 Growth of U.S. ETFs over Time

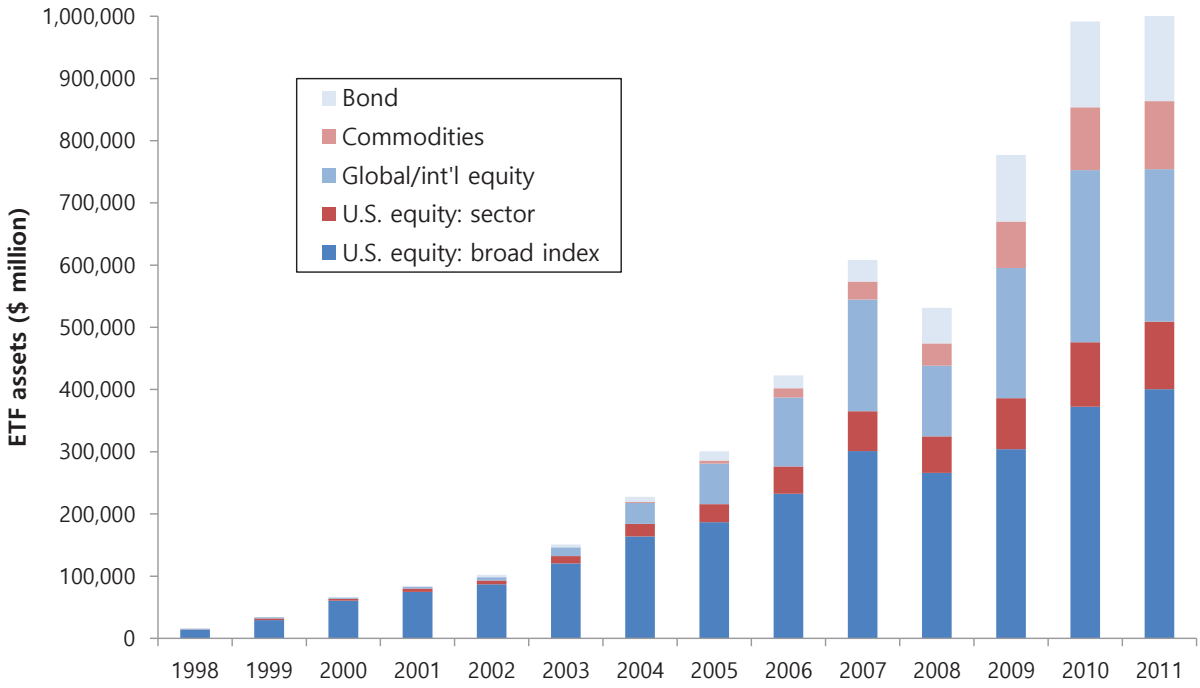


Figure 4.3 Investment Company Assets Under Management, 2011 ($ Billion)

FIGURE 1.2

The United States Has the World's Largest Mutual Fund and ETF Markets

Percentage of total net assets, year-end 2014

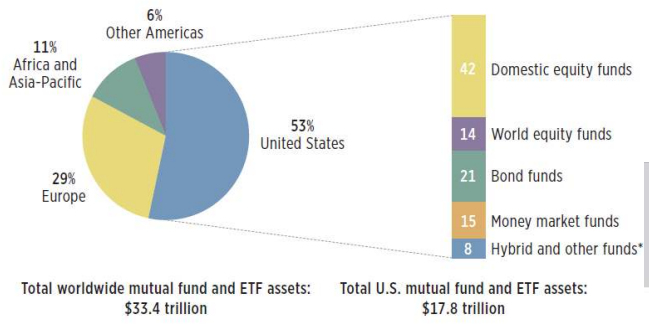
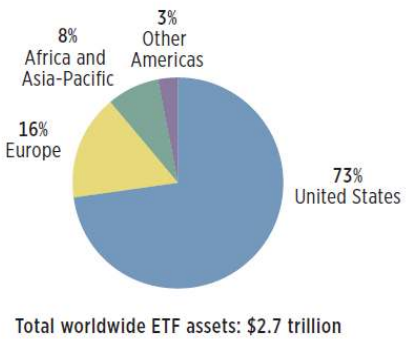


FIGURE 3.1

The United States Has the Largest ETF Market

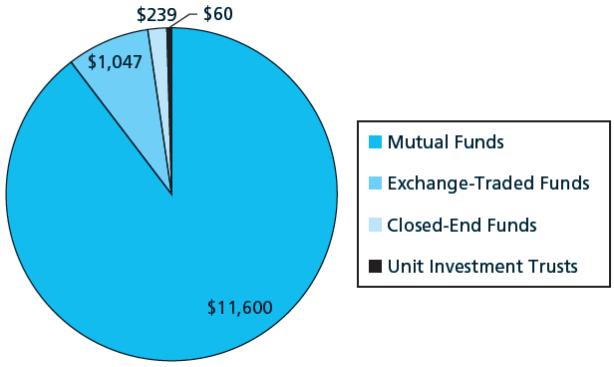
Percentage of total net assets, year-end 2014

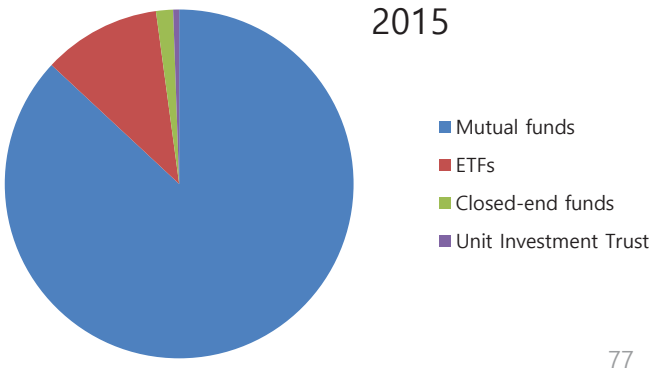


Total worldwide ETF assets: $2.7 trillion

Sources: Investment Company Institute and ETFGI

Figure 4.3 Investment Company Assets Under Management, 2011 ($ Billion)





Mutual Fund Investment Performance

- Performance of actively managed funds:
  - Below the return on the Wilshire index in 25 of the 41 years from 1971 to 2011
  - Evidence for persistent superior performance (due to skill and not just good luck) is weak, but suggestive
  - Bad performance is more likely to persist

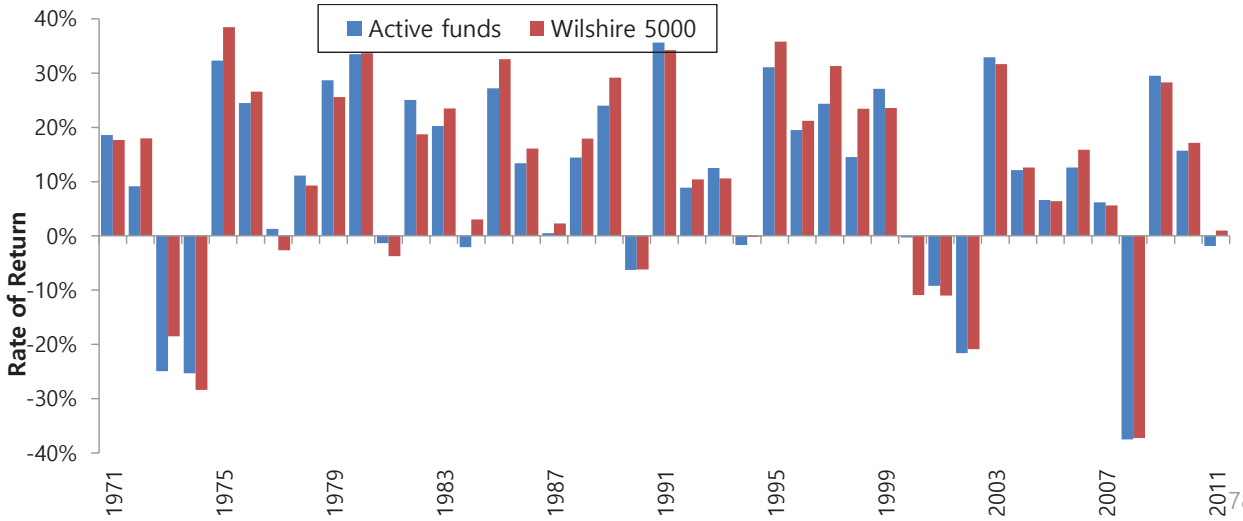


Table 4.4 Consistency of Investment Results

Initial Period Performance	Successive Period Performance	
	Top Half	Bottom Half
A. Malkiel study, 1970s		
Top half	65.1%	34.9%
Bottom half	35.5	64.5
B. Malkiel study, 1980s		
Top half	51.7	48.3
Bottom half	47.5	52.5

- Morningstar (www.morningstar.com)
- Yahoo (biz.yahoo.com/funds)
- Investment Company Institute (www.ici.org)
- Directory of Mutual Funds