Financial Markets: Part III

BUSS254 Investments

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Lecture Outline

- Money markets: Call, Repo, CD, CP, etc.
- Capital markets: Bond, Equity
- Derivatives markets: Futures, options etc.
- Trading mechanisms
- Investment Companies
- Reading: BKM Ch. 3 and 4

Trading Mechanics

Why Trade?

- **Information-driven trading**: Traders act on private or public information.
- **Non-information-driven trading**:
  - **Hedging**: Reducing risk exposure.
  - **Liquidity needs**: Buying or selling for cash flow reasons.
- **Noise trading**: Trading without fundamental justification, often irrational or random.

Types of Orders

- **Market order**: Executes immediately at the best available price.
  - Quick execution vs. Price uncertainty.
- **Limit order**: Specifies price and waits for execution at that price or better.

  - Price control vs. Execution uncertainty.

- **Stop order**: Becomes a market order once the stop price is triggered.
  - **Stop-loss**: Sells when the price falls below a set level.
  - **Stop-buy**: Buys when the price rises above a set level.
- **Short selling**: Selling borrowed shares to profit from a price decline.
- **Margin trading**: Borrowing funds to amplify trading positions, increasing both potential gains and risks.

Margin Trading

- **Margin Purchase** = Borrowing + Investor's Equity
- **Initial Margin**: Minimum equity required to open a position.
- **Maintenance Margin**: Minimum equity required to keep the position open.
- **Margin Call**: If the value of securities falls too much, the investor must:
  - Deposit more equity ($\geq$ initial margin), or
  - Liquidate the position.

Margin Trading: Example

- **Stock Price**: \$100 per share
- **Shares Purchased**: 100
- **Initial Margin**: 60%
- **Maintenance Margin**: 30%

Initial Position:

Asset	Value	Liability	Equity
Stock	\$10,000	Borrowed	\$4,000
		Investor Equity	\$6,000

If Stock Price Falls to \$70:

Asset	Value	Liability	Equity
Stock	\$7,000	Borrowed	\$4,000
		Investor Equity	\$3,000

- **Margin%** = Equity / Market Value = $\frac{\$3,000}{\$7,000} = 43\%$
  - Since $43\% > 30\%$ (maintenance margin), no margin call.

Margin Trading: Maintenance Margin

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

- **Maintenance Margin** = 30%
- **Formula for Equity**: Equity = Market Value − Borrowed Amount = $100P - 4,000$
- **Margin% Formula**: $\frac{100P-4,000}{100P} = 0.30$
- **Solving for Price**:

$$100P - 4,000 = 30P70P = 4,000P = 57.14$$

Short Sales

- Selling securities that you do not own to profit from a decline in the price of the securities
  1. **Borrow securities** through a dealer or broker.
  2. **Sell them** and deposit the proceeds along with the margin in an account.
     - You **cannot withdraw** the proceeds until you "cover" the position.
  3. **Closing out the position**: Buy back the securities and return them to the lender.
- Naked short-selling:
  - Selling shares **without borrowing them first**, assuming they can be acquired later.
  - **Illegal** due to the risk of delivery failure.

Short Sales: Example

- **Stock X**: 1000 shares
- **Initial Price**: $100 per share
- **Initial Margin**: 50%
- **Maintenance Margin**: 30%

Position Setup:

Item	Value
Sale Proceeds	$100,000
Initial Margin	$50,000
Stock Owed	1000 shares

Balance Sheet:

Assets	**Liabilities**
$100,000 (sale proceeds) $50,000 (initial margin)	$100,000 (shares owed)
	Equity $50,000

Short Sales: Example (cont'd)

- If Price Falls to **$70 per share**:

Assets	**Liabilities**
$100,000 (sales proceeds) $50,000 (initial margin)	$70,000 (shares)
	Equity $80,000

- Profit Calculation:

$$\text{Profit} = \text{Ending Equity} - \text{Beginning Equity} = \$80,000 - \$50,000 = \$30,000 = (\text{Initial Price} - \text{New Price}) \times \text{Shares}$$

Short Sales: Example (cont'd)

- Maximum Stock Price Before Margin Call:
- **Formula**:

$$\text{Margin\%} = \frac{\text{Assets} - \text{Liabilities}}{\text{Market Value}} = \frac{(\$150,000 - 1000P)}{1000P} = 0.30$$

- **Solving for P**:

$$150,000 - 1000P = 0.30 \times 1000P 150,000 = 1300P P = 115.38$$

- $150,000$: Initial margin plus sale proceeds

Trading Mechanisms

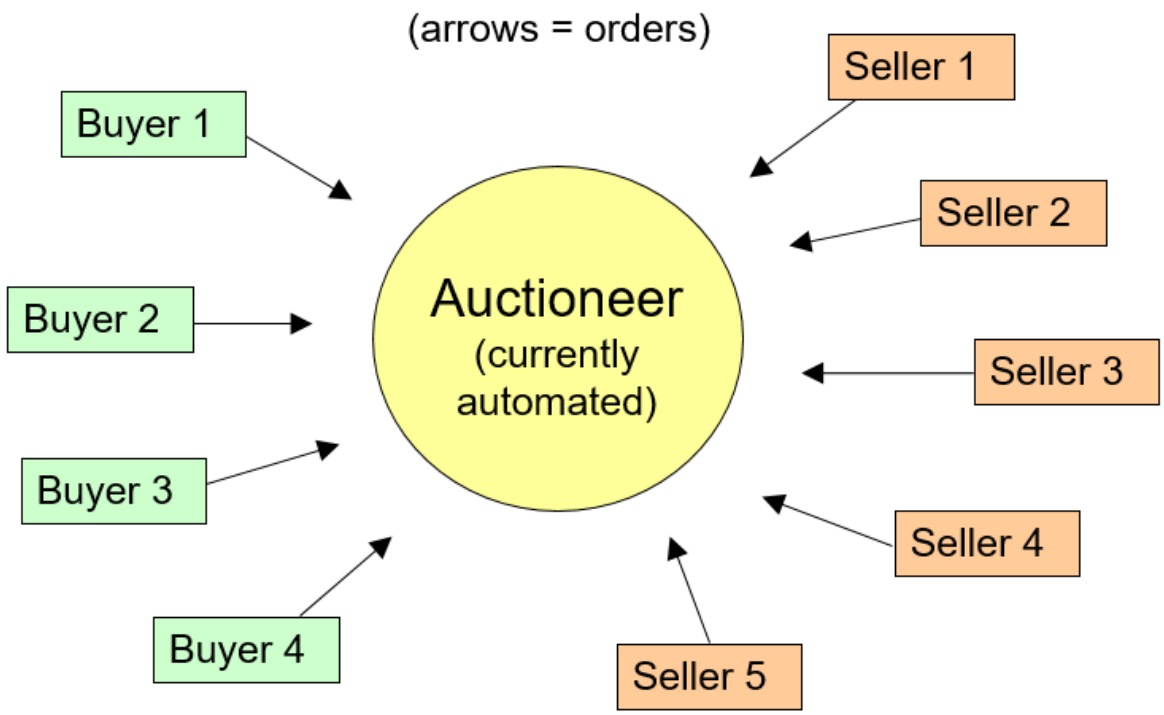
Auction Market

- **Centralized**: Investors interact directly.
- Orders are consolidated in a **limit order book (LOB)**:
  - **Bid** (buy) and **ask** (sell) orders.
- **Order-driven market**: Limit orders determine prices.
- **Examples**: NYSE, Paris, Milan, Tokyo, Korea.

Dearler Market

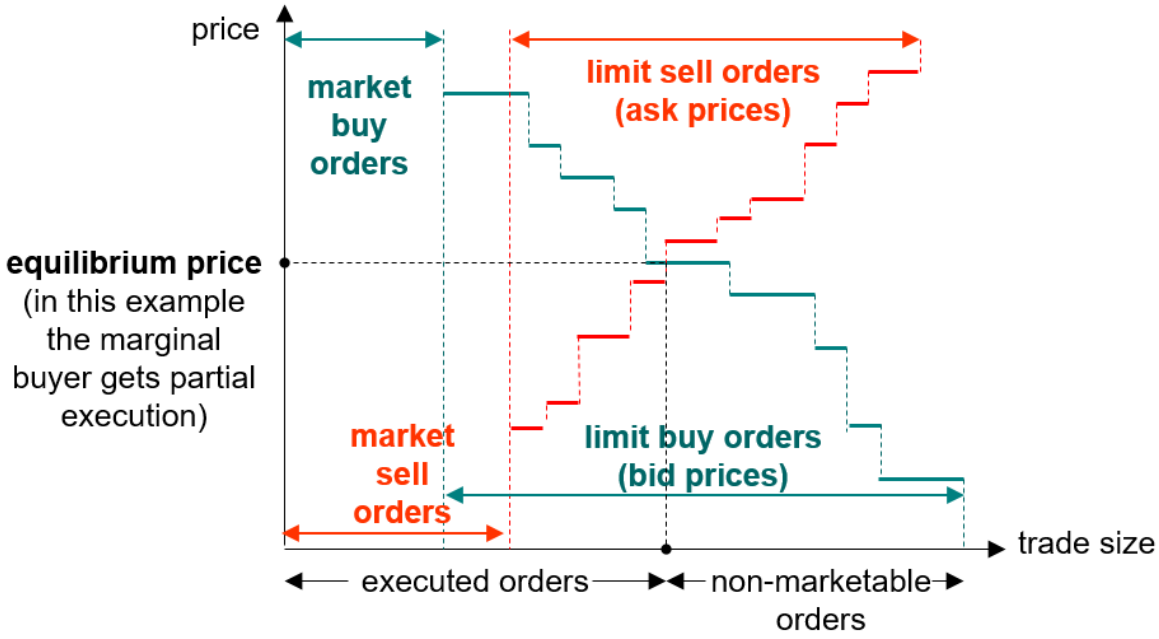
- **Decentralized**: Trades occur via dealers.
- Dealers quote **bid-ask prices**, taking on inventory risk.
- **Quote-driven market**: Dealers set prices.
- **Examples**: Nasdaq, bond markets, forex markets.

Auction Market



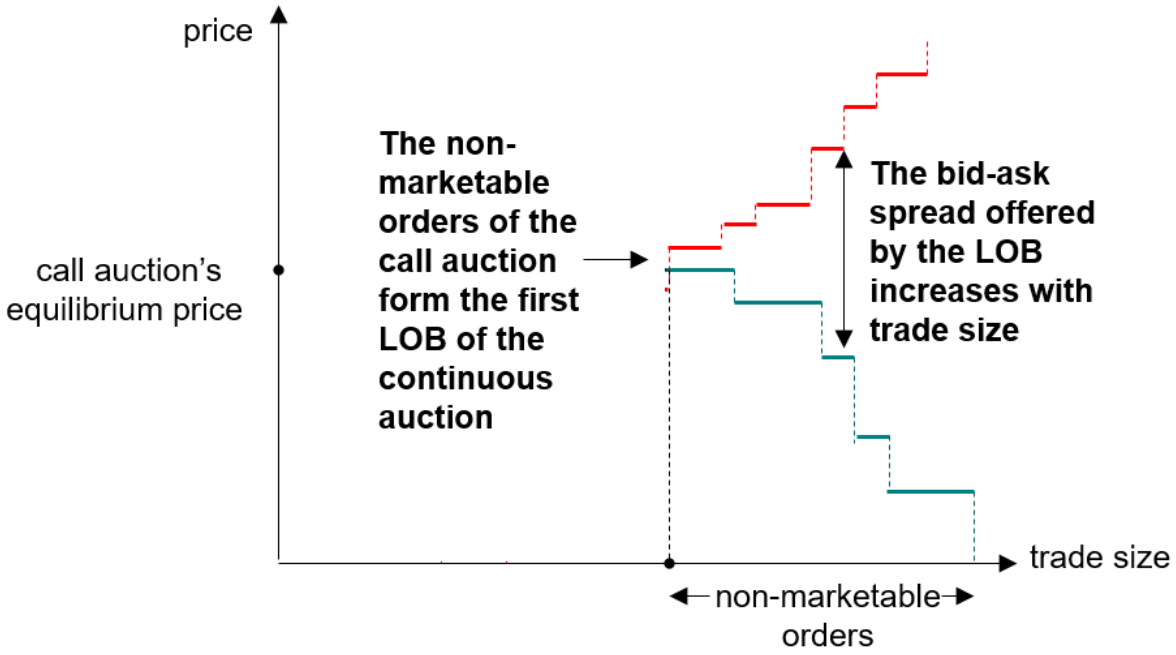
- **Call (Batch) Auction**: Orders are grouped and executed at specific times.
  - Typically at market **open** and **close**.
  - Helps **reduce price distortions** from temporary order imbalances.
- **Continuous Auction**: Trading happens **continuously** throughout the day.

Call Auction



Buy orders sorted by decreasing price (demand), and sell orders by increasing price (supply).

Call Auction (cont'd)



Price set so that supply = demand. All executable orders are filled at that price

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Continuous Auction: Limit Order Book

- **Non-marketable orders** (those not executed in the call auction) enter the **Limit Order Book (LOB)**.
- Incoming orders **execute against the LOB** based on:
  - **Price priority**: Best prices executed first.
  - **Time priority**: Older orders executed before newer ones at the same price.

Bid			Ask		
Price	Size	Time	Price	Size	Time
74.42	300	11:49:39	74.48	300	11:49:35
74.41	100	11:46:55	74.48	500	11:49:50
74.36	400	11:48:30	75.74	100	08:25:17
74.36	400	11:48:32	76.00	150	08:02:02

- Market sell order of 200 (or limit sell with price < 74.42)
- Market buy order of 900 (or limit buy with price > 75.74)
- Because of the two orders, the bid-ask spread widens from $74.48 - 74.42 = 0.06$ to $76.00 - 74.42 = 1.58$.
  - **The two orders have "consumed" liquidity.**
- Market liquidity: the ability to trade securities quickly at a price close to its consensus value

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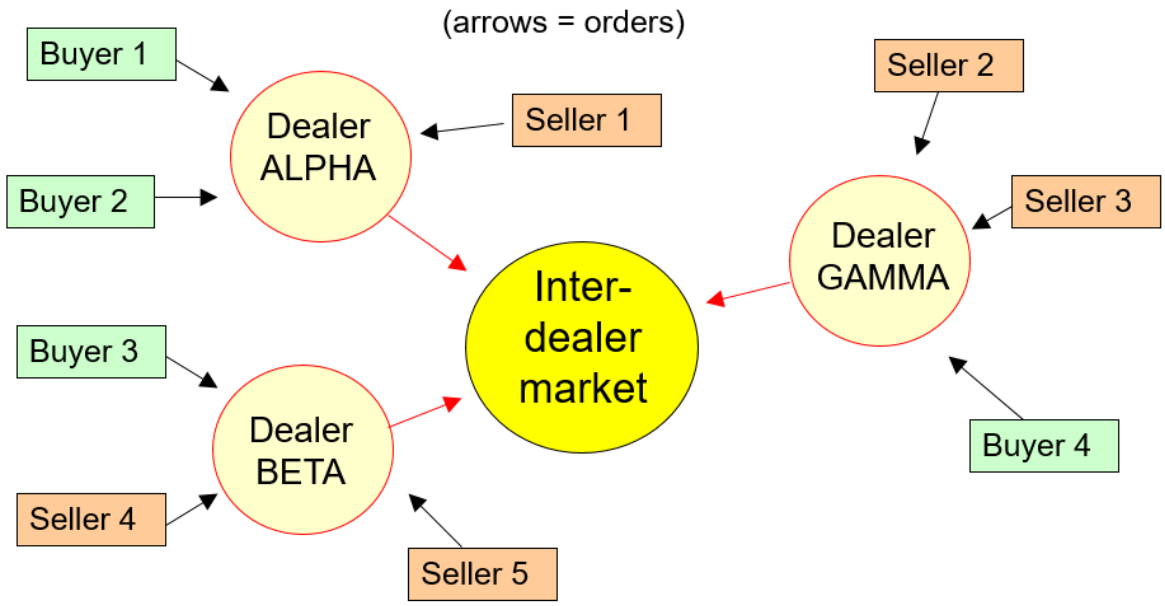
Dark Pools

- Electronic trading platforms accessible only to institutional investors.
  - Operated by stock exchanges (e.g., Turquoise by the LSE, Smartpool by Euronext, or Xetra by the Deutsche Börse), brokers (e.g., BlockCross by ICAP or Blockmatch by Instinet) or banks (e.g., SigmaX by Goldman Sachs or SG CIB AlphaY by Société Générale).
  - Operate in parallel with continuous limit order markets and offer investors an alternative way to execute their orders.
- Generally, dark pools do not contribute to price discovery
  - Reference prices drawn from other markets
- "Dark": orders are not displayed to the rest of market participants.
  - Reduces the risk of information leakage

Dealer Market

In dealer markets, investors do not trade directly with each other, but must contact a dealer, find out his price, and trade at this price, or else try another dealer.



Dealer Market: Example

Market Maker	Bid Price	Offer Price	Quote Size	Time
ALPHA	326	330	75 × 75	8:53
BETA	324	330	75 × 75	9:14
GAMMA	325	329	75 × 75	9:16
DELTA	323	332	75 × 75	8:53
EPSILON	325	329	25 × 25	9:36
ZETA	326	330	75 × 75	11:30
ETA	325	330	75 × 75	9:45
THETA	325	330	75 × 75	9:23
IOTA	324	329	75 × 75	10:27
KAPPA	323	330	75 × 75	9:45
LAMBDA	325	330	75 × 75	8:53

- **Seller 4** wants to sell **60 shares**.
- Contacts **Dealer Beta**, who quotes **Bid = $324, Ask = $330**.
- Seller 4 **can sell at $324** or try another dealer.
- **Inventory Risk**: Dealers face the risk of price drops after acquiring shares.

Dealer Market (cont'd)

Key Differences from Limit Order Markets

- **No price priority enforcement** → Searching for a better price is costly.
- **Dealer markets allow bargaining over price and quantity**.
- Some **dealer markets display real-time quotes** (e.g., Nasdaq).
  - **Corporate bond markets lack real-time data**.
  - **Forex markets provide only indicative quotes**.

Preferencing & Payment for Order Flow

- **Preferencing**: A broker commits to routing orders to a specific dealer.
- **Payment for Order Flow**: Dealers **pay brokers** to route trades to them.
  - Can impact execution quality.

Market-Making Obligations

- Some markets (e.g., NYSE) require **Designated Market Makers (DMMs)**.
- DMMs commit to **providing liquidity** by maintaining bid-ask prices up to a specific trade size.

Investment Companies

Investment Companies

- **Pool funds** from individual investors to invest in **diversified assets**.
- **Types of Investment Companies**:
  - **Unit Investment Trusts (UITs)**: Fixed portfolio, **unmanaged**.
  - **Managed Investment Companies**:
    - **Open-end** vs. **Closed-end** funds.
    - **Active** vs. **Passive** management.
  - **Other Types**:
    - **Hedge Funds**: Lightly regulated, private investment pools.

    - **Real Estate Investment Trusts (REITs)**: Invest in real estate or mortgages

- Services provided:
  - **Record keeping & administration**
  - **Diversification**: Reducing risk exposure.
  - **Professional management**: Fund managers handle investments.
  - **Lower transaction costs**: Economies of scale reduce expenses.

Investment Companies: Net Asset Value (NAV)

- NAV: The value of each share in the investment company

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

Example

- A mutual fund manages a portfolio worth **$120 million**, with:
  - **Liabilities** = $4M (advisory fees) + $1M (rent, wages, misc.).
  - **Shares Outstanding = 5 million**.

$$\text{NAV} = \frac{120 - 5}{5} = \$23 \text{ per share}$$

Mutual Funds: How to Invest?

- **Ways to Purchase Mutual Funds**:
  1. **Direct-marketed funds**: Buy directly from the fund.
  2. **Sales-force distributed**:
     - Sold through brokers or financial advisors.
     - **Revenue sharing** creates potential conflicts of interest.
  3. **Financial supermarkets**:
     - Platforms offering multiple funds.

- **Fee Structure**
  - **Operating Expenses** – Management fees
  - **Front-end load** – **Upfront commission** (e.g., 4%-5%)
  - **Back-end load** – **Exit fee**, decreasing over time
  - **12b-1 fees** – Annual marketing & distribution charges
- **Fees must be disclosed** in the **fund prospectus**.
- Different **share classes** offer varying fee structures.

Example: Dreyfus High Yield Fund (2018)

- **Front-end loads vs. 12b-1 charges**:
  - **Class A**: Front-end load, lower ongoing fees.
  - **Class C**: No front-end load, but higher annual fees.
  - **Class I**: Institutional investors only, lowest fees.

	Class A	Class C	Class I
Front-end load	0–4.5%[a]	0	0
Back-end load	0	0–1%[b]	0%
12b-1 fees[c]	0.25%	1.0%	0%
Expense ratio	0.7%	0.7%	0.7%

[a]Depending on size of investment. Starts at 4.5% for investments less than $50,000 and tapers to zero for investments more than $1 million.
[b]Depending on years until holdings are sold. Exit fee is 1% for shares redeemed within one year of purchase.
[c]Including annual service fee.

Impact of Costs on Investment Performance

	Cumulative Proceeds (All Dividends Reinvested)		
	Fund A	**Fund B**	**Fund C**
Initial investment*	$10,000.00	$10,000.00	$ 9,400.00
5 years	15,922.92	15,210.60	14,596.24
10 years	25,353.93	23,136.23	22,664.92
15 years	40,370.85	35,191.60	35,193.90
20 years	64,282.18	53,528.53	54,648.80

*After front-end load, if any.
Notes:
1. Fund A is no-load with .25% expense ratio.
2. Fund B is no-load with 1.25% expense ratio.
3. Fund C has a 6% load on purchases and a .8% expense ratio.
4. Gross return on all funds is 10% per year before expenses.

- **Higher costs reduce net returns**.
- **Lower-fee funds** outperform over time due to compounding effects.

Comparing Share Classes: Equity Fund Example*

Fee Structures

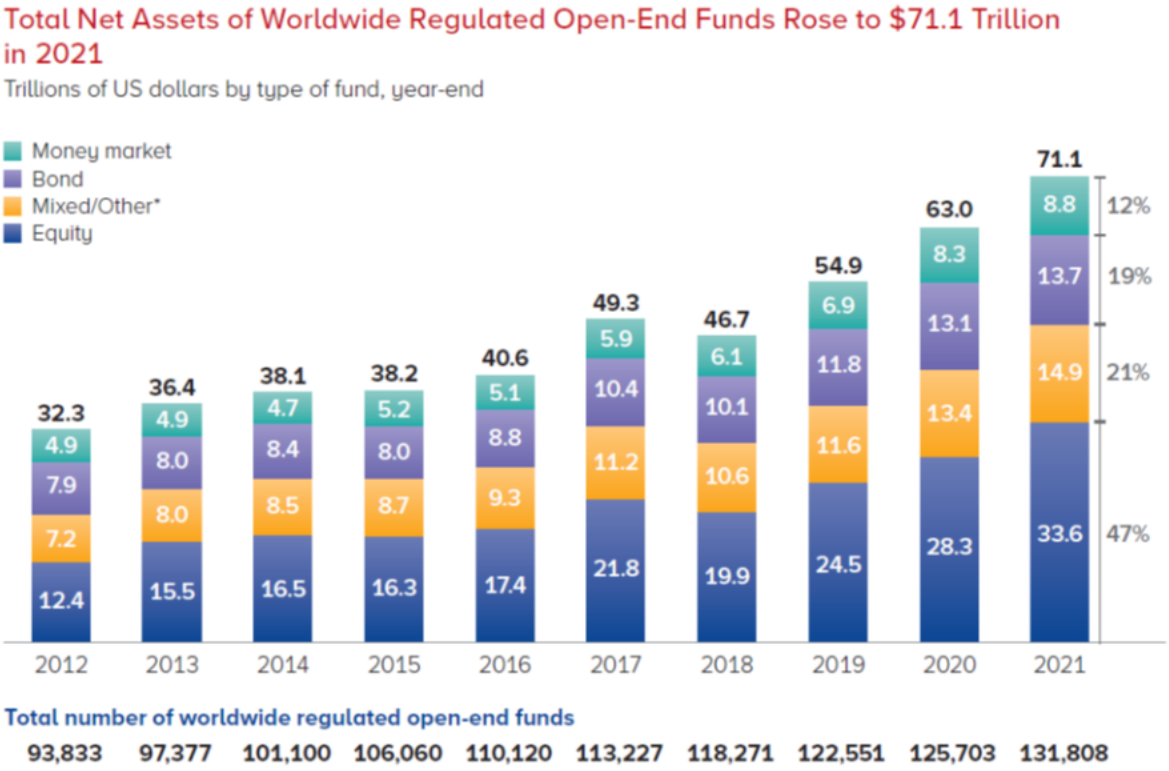
- **Class A**: **4% front-end load**, no ongoing fees.
- **Class B**: **No front-end load**, but **0.5% 12b-1 fees** and a **declining back-end load**:
  - Starts at **5%**, decreases **1% per year** (until year 5).
- **Fund Portfolio Return**: **10% net of operating expenses**.

Scenario: What Happens to a $10,000 Investment?

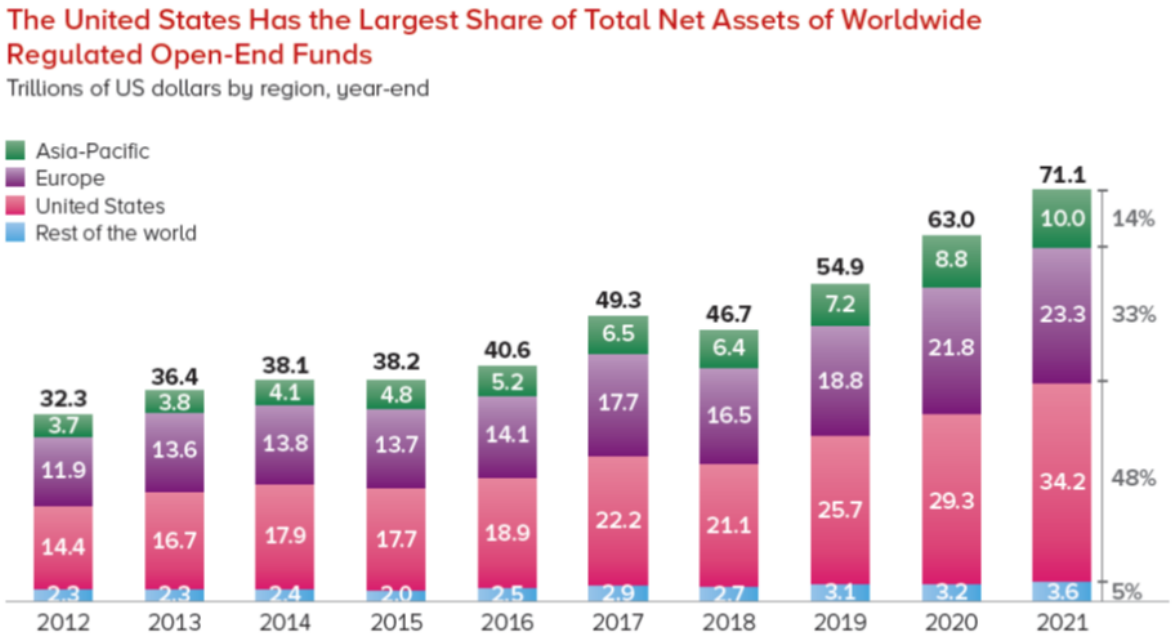
1. **[1 year]**
2. **[4 years]**
3. **[10 years]**

Which share class provides higher net proceeds at different investment horizons?

Investment Companies: Market Size



Investment Companies: By Region



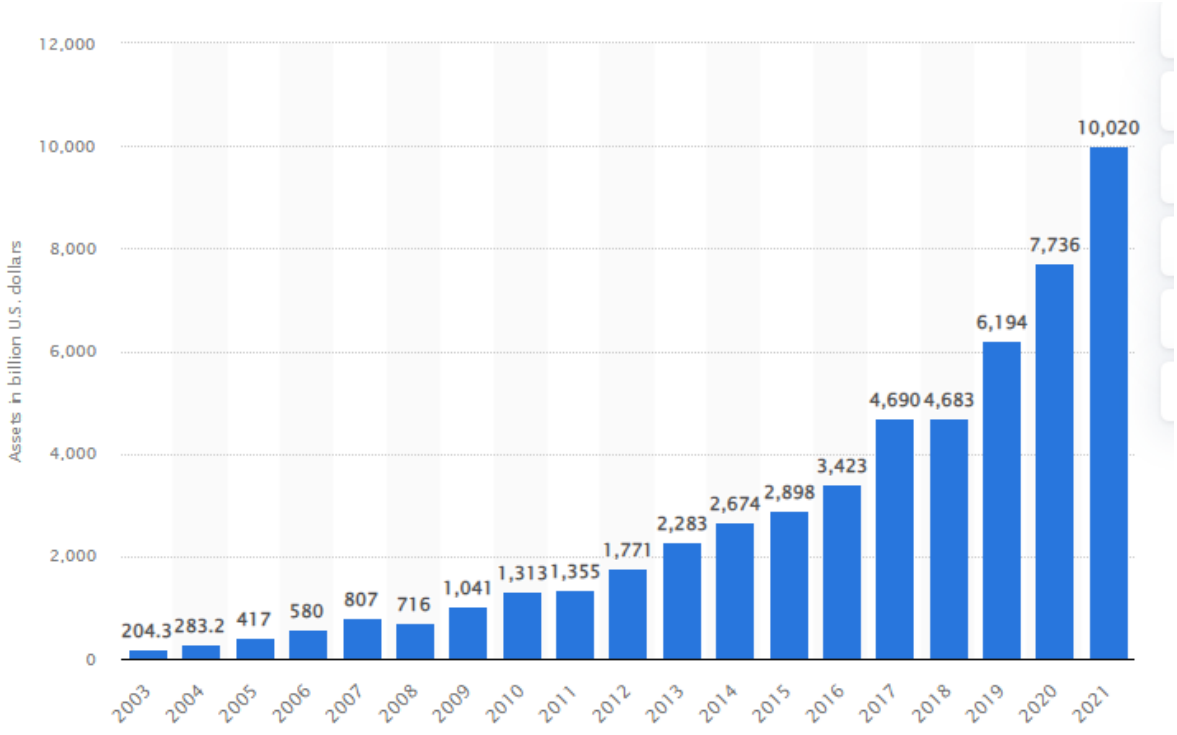
Investment Companies: Recent Development

- **Exchange-Traded Funds (ETFs)**:
  - Trade continuously like stocks.
  - Can be sold short or purchased on margin.
  - Generally lower costs than mutual funds.
  - **Advantages of ETFs**:
    * More flexible than index funds.
    * Lower expense ratios than actively managed mutual funds.
    * Tax efficiency due to in-kind redemptions.
  - **Disadvantages of ETFs**:
    * Prices may deviate from **Net Asset Value (NAV)**.
    * Must be purchased through a broker, incurring trading costs.
- **Actively Managed ETFs**

  - Traditionally, ETFs were required to track **specified indexes**.
  - Recent expansion includes **actively managed ETFs** that follow different investment strategies:
    * Value investing
    * Growth stocks
    * Dividend yield
    * Liquidity factors
    * Recent performance trends
    * Volatility
  - **Key Feature**:
    * Unlike traditional mutual funds, actively managed ETFs **disclose their portfolio composition daily**.

- **Non-Transparent Actively Managed ETFs**
  - **Challenge**: Frequent portfolio disclosure could allow competitors to exploit fund trading strategies.
  - **Solution**: Development of **non-transparent actively managed ETFs**.
  - **Regulatory Approval**:
    * In 2014, the SEC granted permission to Eaton Vance to introduce an actively managed **non-transparent ETF**.
    * **NextShares** began trading in 2016.
  - **Key Difference**:
    * Unlike traditional ETFs, these funds limit portfolio disclosure to protect trading strategies.

Investment Companies: ETF Trends



Source: Statistica - Global exchange-traded funds (ETFs) from 2003 to 2021

Investment Companies: Mutual Fund Performance

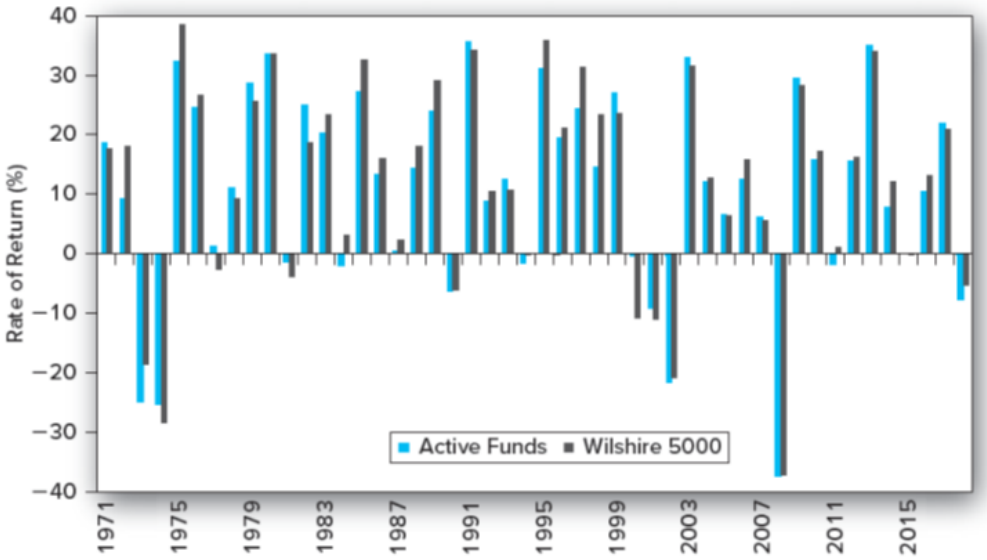


Figure 4.4 Rates of return on actively managed equity funds versus Wilshire 5000 index, 1971–2018

Source: For Wilshire returns, see **www.wilshire.com**. For active fund returns, see *SPIVA U.S. Scorecard,* S&P Dow Jones Indices Research.

Investment Companies: Performance Persistence

Table 4.3

Consistency of investment results

The percentage of top-half equity funds that remain in the top half in the following two years.

	Number of top-half performers in year ending March 2016	Percentage of 2016 outperformers that perform in top half of sample in year ending March 2017	Percentage performing in top half of sample both in year ending March 2017 and year ending March 2018
All domestic equity funds	1,114	34.6	16.3
Large-cap equity funds	428	38.3	22
Small-cap equity funds	260	49.6	13.5

Source: Aye Soe and Belinda Liu, "Does Past Performance Matter? The Persistent Scorecard," S&P Dow Jones Indices, July 2018.

Investment Companies: Closed-end Funds

FUND	NAV	MKT PRICE	PREM/ DISC %	52-WEEK MKT RETURN %
Gabelli Div & Inc Tr (GDV)	20.96	18.59	−11.31	−17.26
Gabelli Equity Trust (GAB)	5.34	5.20	−2.62	−8.90
General Amer Investors (GAM)	35.24	28.86	−18.10	−9.89
Guggenheim Enh Eq Inc (GPM)	7.11	6.94	−2.39	−14.67
J Hancock Tx-Adv Div Inc (HTD)	22.94	21.16	−7.76	−2.52
Liberty All-Star Equity (USA)	5.99	5.38	−10.18	−7.13
Liberty All-Star Growth (ASG)	4.96	4.46	−10.08	−10.07

- Closed-end Fund Puzzle
  - The common divergence of price from net asset value, often by wide margins, is a puzzle that has yet to be fully explained

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Investment Companies: Hedge Funds

- **Hedge Funds**:
  - Typically structured as **private partnerships**.
  - Subject to **minimal regulation**, unlike mutual funds.
  - Can pursue **complex investment strategies**:
    - Heavy use of **derivatives**.
    - **Short selling**.
    - **Leverage** to amplify returns.
  - Not available to the general public; open only to **wealthy or institutional investors**.
- **Lock-Up Periods**:
  - Many hedge funds require an initial **"lock-up" period** of several years.
  - Investors cannot withdraw funds during this time.
  - Allows hedge funds to invest in **illiquid assets** without facing immediate redemption pressure.

References

- Financial Markets in Korea (Bank of Korea)
- Korea Treasury Bonds (Ministry of Economy and Finance)
- Capital Market Factbook (SIFMA)
- The Korea Exchange (KRX)
- Investment Company Factbook (ICI)