

Module 1: Introduction to Investments

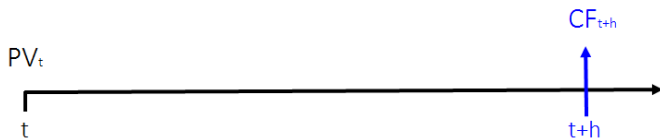
(BUSFIN 4221 - Investments)

Andrei S. Gonçalves¹

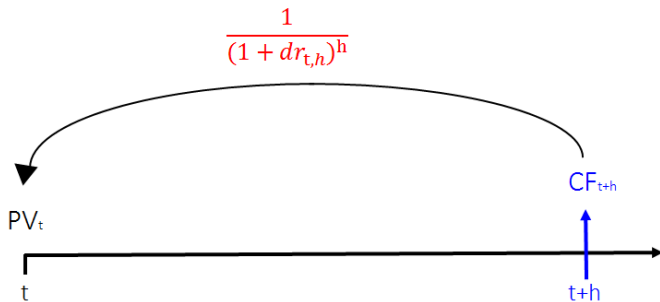
¹Finance Department
The Ohio State University

Fall 2016

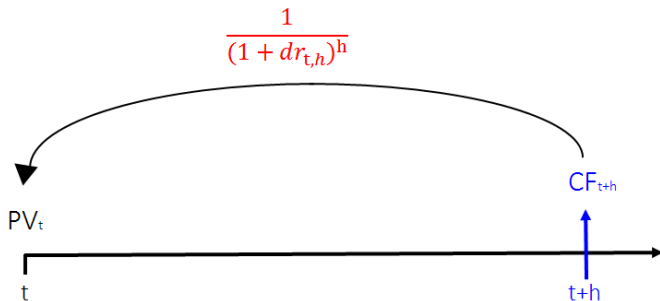
The Investment Principle



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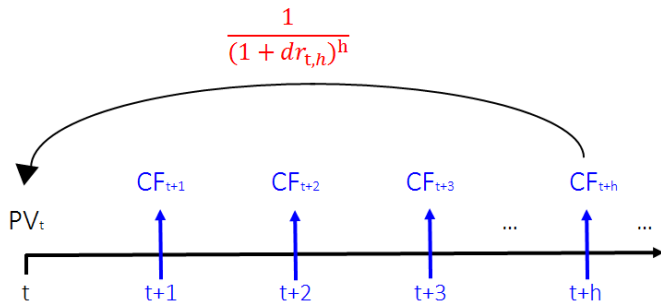
$$PV_t = \frac{E_t[CF_{t+h}]}{(1 + dr_{t,h})^h}$$

$PV_t \rightarrow$ Present Value

$CF_{t+h} \rightarrow$ Future Cash Flow

$dr_{t,h} \rightarrow$ Discount Rate

The Investment Principle



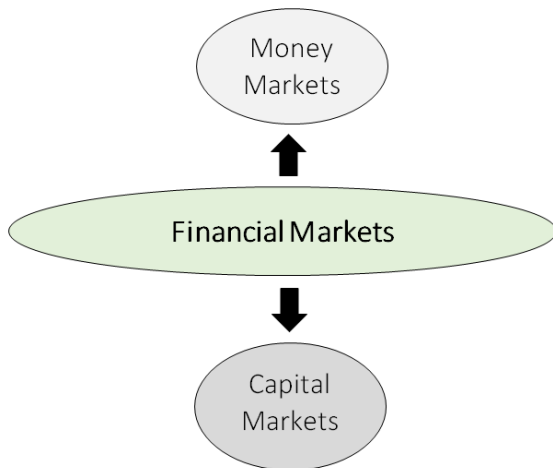
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Real x Financial Assets

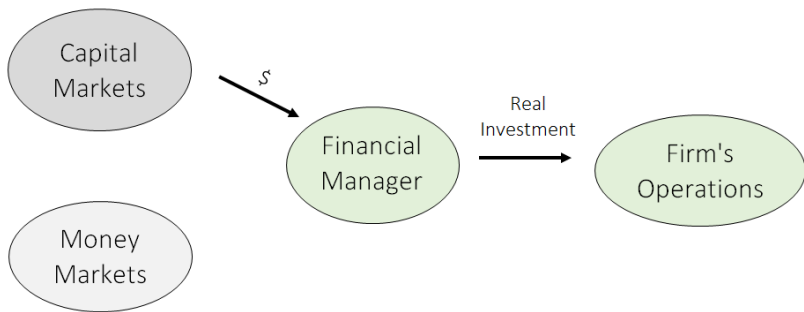
$$PV_t = \sum_{h=1}^{\infty} \frac{\mathbb{E}_t [CF_{t+h}]}{(1 + dr_{t,h})^h}$$

- Real Asset: machinery in a Ford's auto plant
 - $PV_t \Rightarrow$ price of machinery + transportation and installation cost
 - $CF_{t+h} \Rightarrow$ stream of (net) profits from sales + resale value
 - $dr_{t,h} \Rightarrow$ cost of capital incurred by the firm
- Financial Asset: Ford stock
 - $PV_t \Rightarrow$ current price of stock
 - $CF_{t+h} \Rightarrow$ dividend stream to be paid in the future
 - $dr_{t,h} \Rightarrow$ required rate of return for holding this risky asset

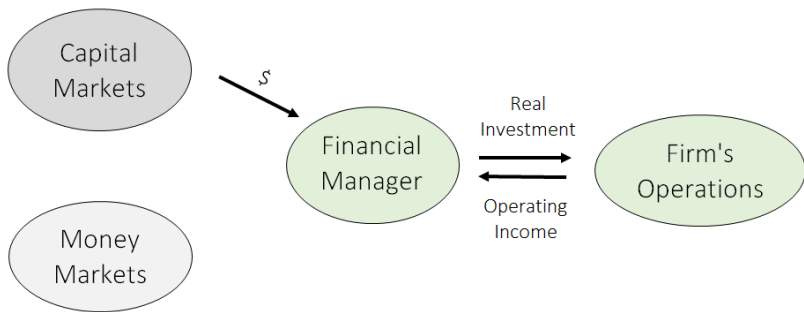
Financial Markets



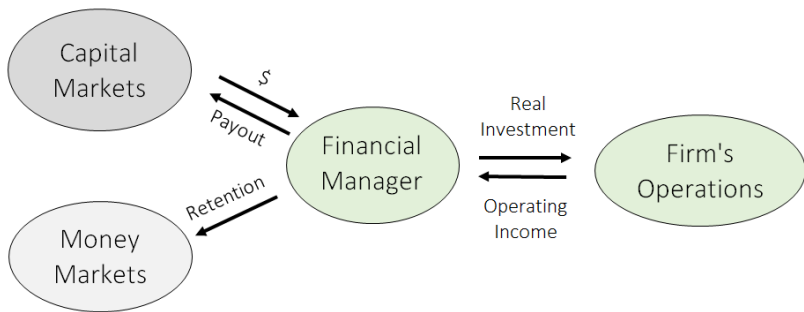
The Demand for Capital



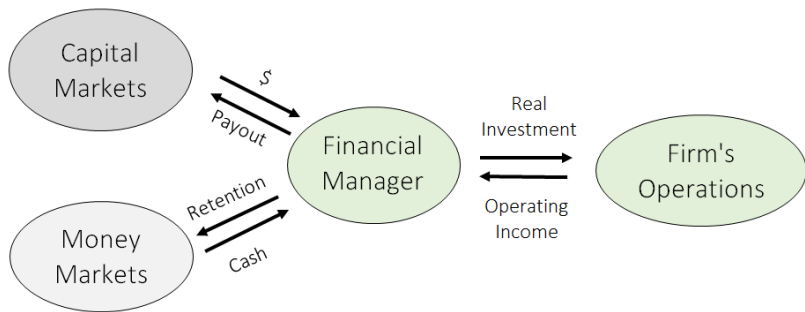
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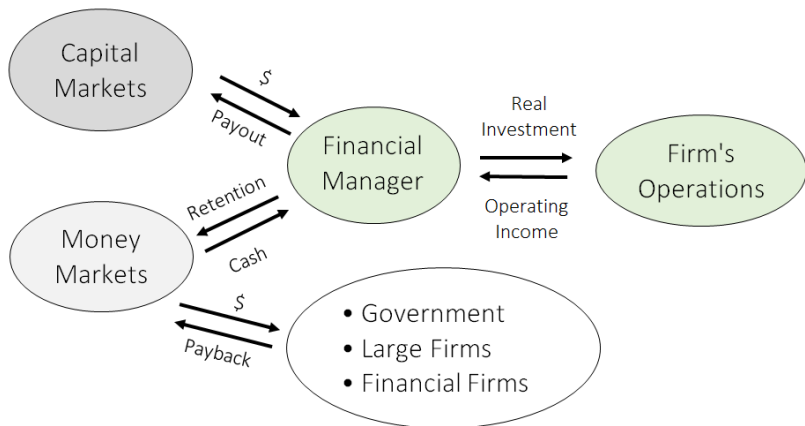
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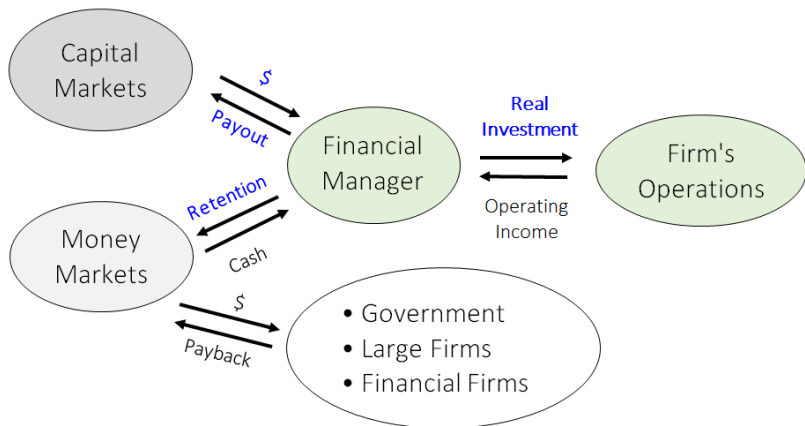
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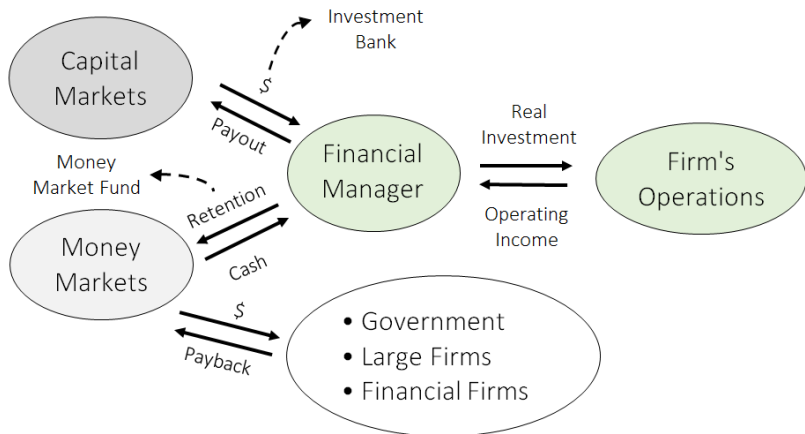
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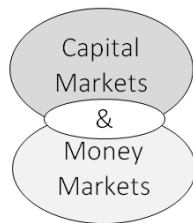
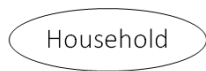
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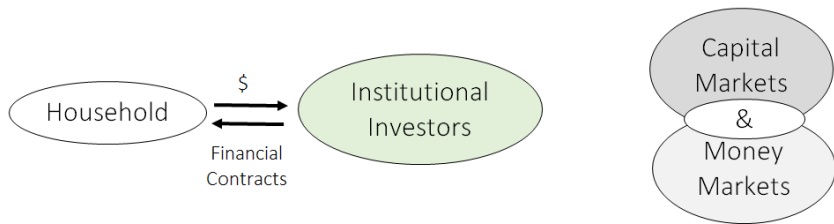
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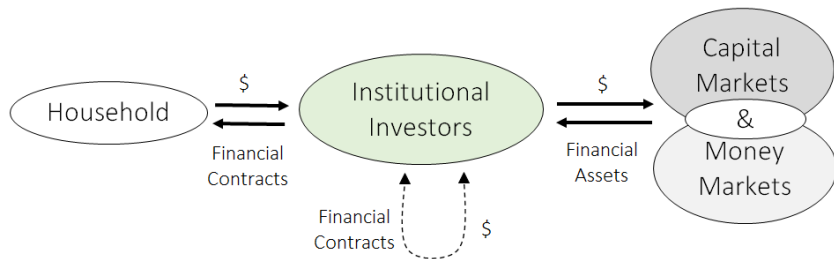
The Supply of Capital



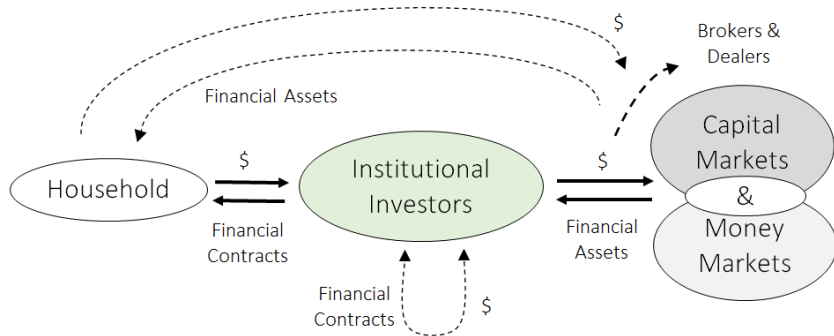
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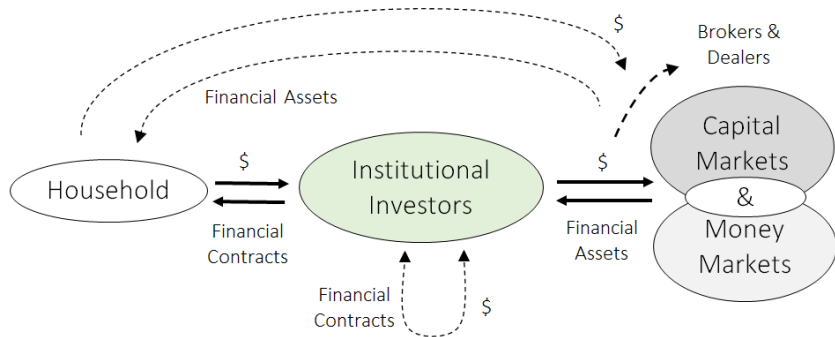
The Supply of Capital



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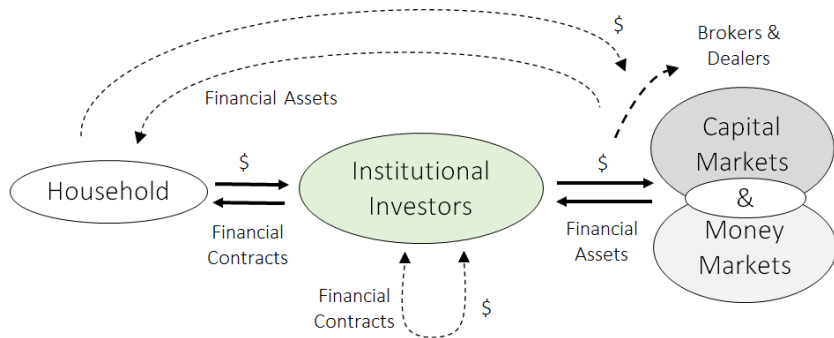


The Investment Process in Competitive Markets



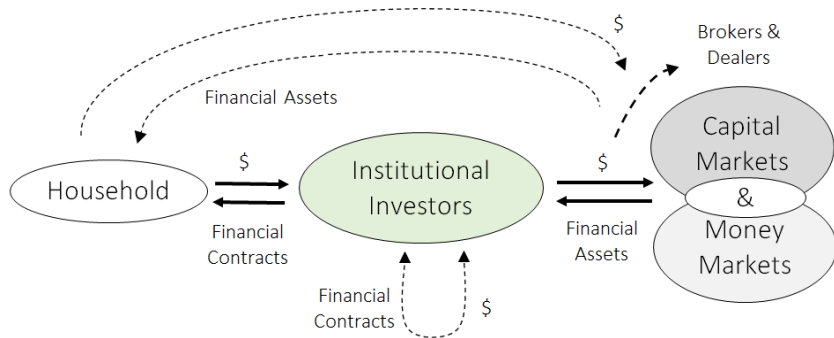
- Asset Allocation vs Security Selection
- Top-down vs Bottom-up Portfolio Construction
- Buy Side vs Sell Side Analysts
- Risk-Return trade-off & Efficient Markets

Financial Markets & the Economy



- Consumption Timing
- Funding Real Assets in an Efficient Manner
- Allocation of Risk
- Separation of Ownership and Management

Next Topics of Introduction to Investment

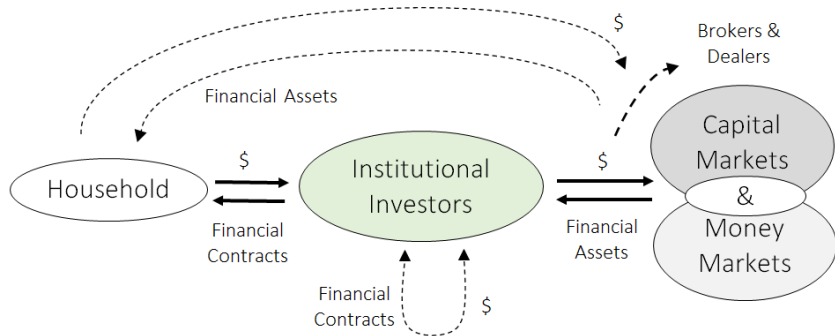


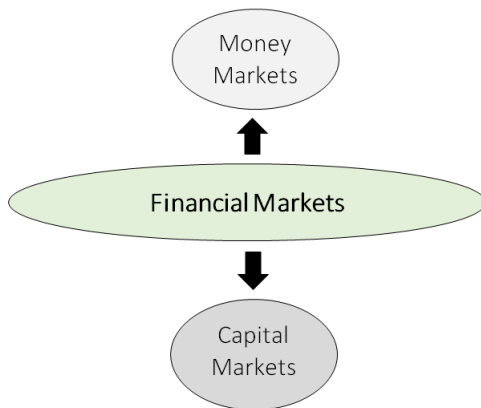
- Asset Classes & Instruments
- Trading Securities
- Investment Companies

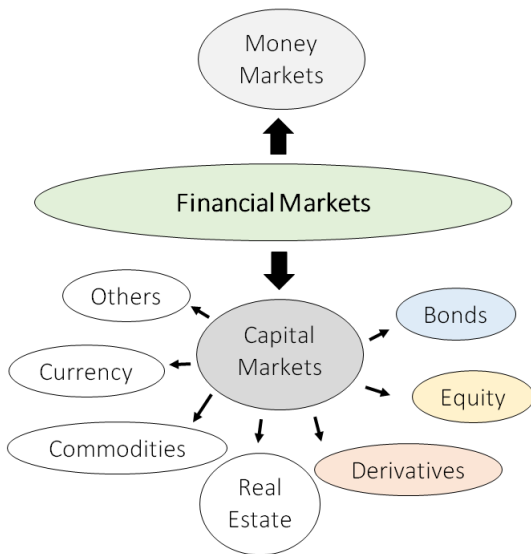
Modules 2 to 8

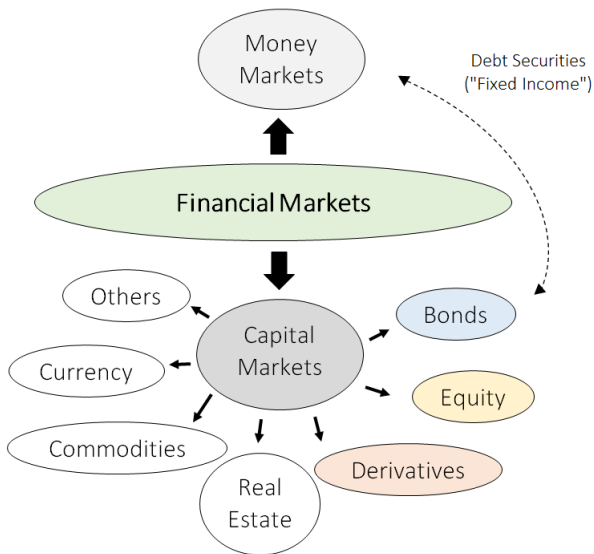
$$PV_t = \sum_{h=1}^{\infty} \frac{\mathbb{E}_t [CF_{t+h}]}{(1 + dr_{t,h})^h}$$

Financial Securities found in Capital/Money Markets

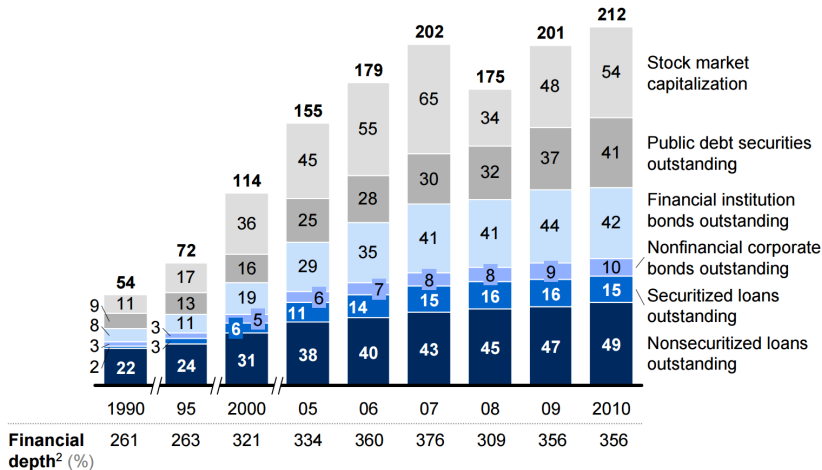








Global Equity and Debt Outstanding (\$ Trillion)

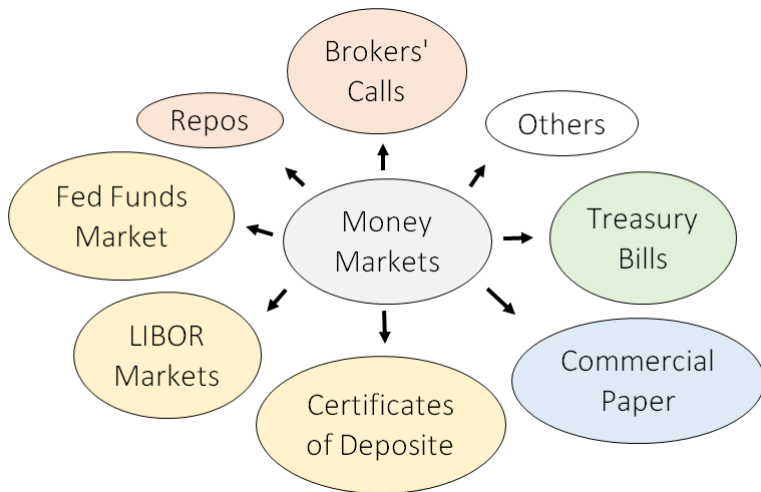


Source: *Mapping global capital markets 2011*, MacKinsey Global Institute

Money Markets: Cash Flows



Money Markets: Securities



Money Markets: Securities

Treasury Bills (T-Bills) = Short-Term Loans to the Government

Maturity: 4, 13, 26 or 52 weeks

Liquidity: highly liquid

Default Risk: (almost) none

Commercial Papers (CPs) = Short-Term Loans to Large Firms

Maturity: up to 270 days (typically less than 2 months)

Liquidity: traded in secondary markets (quite liquid)

Default Risk: low risk over short-term (credit rating available)

Certificates of Deposit (CD) = Short-Term Loans to Banks

Maturity: varies, but minimum of 14 days

Liquidity: high liquidity for marketable CDs with maturity \leq 3 months

Default Risk: first \$250,000 is insured by the FDIC

Repos = (very) Short-Term Loans to Financial Institutions

Maturity: overnight repurchase agreement, but some up to a month

Liquidity: not traded in secondary markets, but used as collateral

Default Risk: very safe since backed by asset under agreement

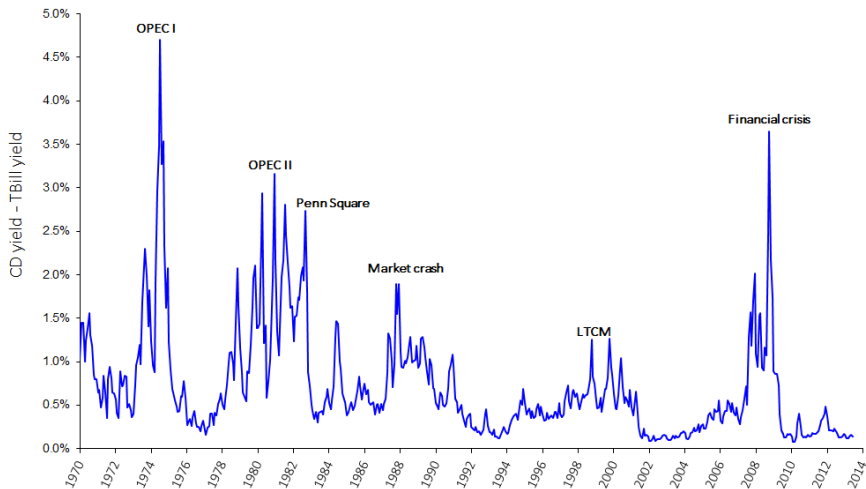
Brokers' Call = (very) Short-Term Loans to Brokers

Specification: debt to fund margin of clients (maturity per lender request)

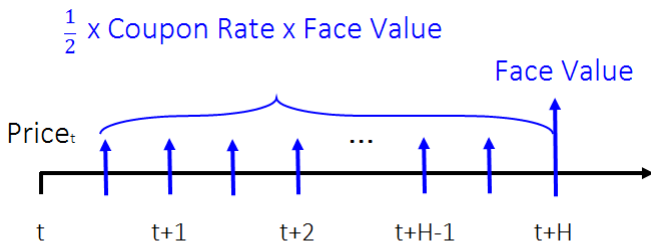
Money Markets: Bank to Bank Loans

- Fed Funds Market = Short-Term Debt Market for Fed Banks*
 - Borrow overnight (originally to meet Fed Funds requirement)
 - No secondary markets or collateral
 - Fed Funds Rate: key interest rate for (very) short-term loans
- LIBOR Market = Short-Term Debt Market for London Banks*
 - LIBOR: London Interbank Offered Rate
 - Maturity ranges from overnight up to one year (7 alternatives)
 - Loans in 5 different currencies (USD, EUR, GBP, JPY & CHF)
 - 35 different LIBOR rates used for short-term loans worldwide
 - LIBOR rate: most commonly quoted is the 3-month USD one

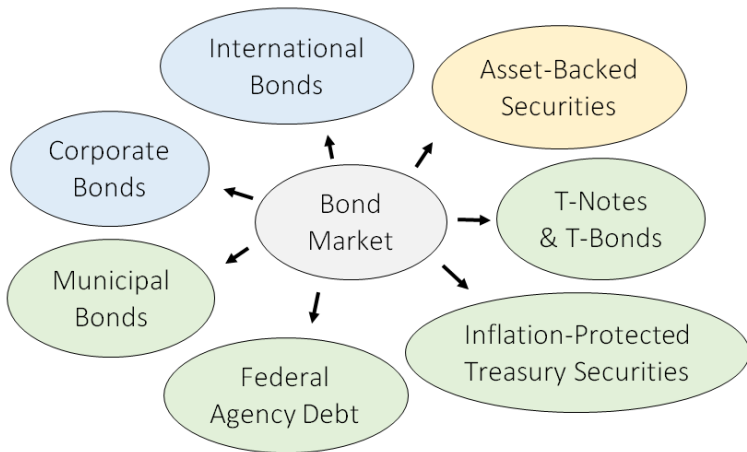
Money Markets: CD yield - TBill yield



Bond Market: Cash Flows



Bond Market: Securities



Bond Market: Securities

T-Notes, T-Bonds & TIPS = Long-Term Loans to the Government

Maturities of 2, 3, 5, 7 and 10 years for T-Notes and up to 30 years for T-Bonds

Both trade in liquid secondary markets and have (almost) no default risk

TIPS = Treasury Inflation Protected Securities

TIPS have face value adjusted by inflation and maturities of 5, 10 and 30 years

Federal Agency Bonds = Long-Term Loans to Federal Agencies

These agencies operate to channel credit to a particular sector or the economy

Their debt is not formally insured by the federal government, but priced as such

Municipal Bonds = Long-Term Loans to State & Local Governments

Interest income exempt from federal (sometimes state/local) income taxation

General Obligation Bonds x Revenue Bonds

Corporate Bonds = Long-Term Loans to Firms

Default risk is an important consideration (firm's *rating* matter a lot)

Secured Bonds x Unsecured Bonds (Debentures) x Subordinated Debentures

Eurobond: denominated in foreign firm currency (e.g., Euro-dollar Bond)

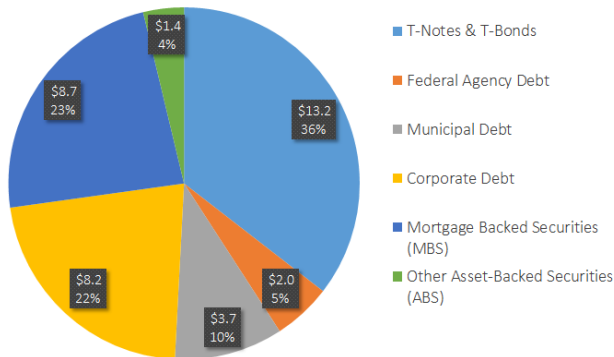
Asset Backed Securities (ABS) = Security "Backed" by a Pool of Loans

Most common are Mortgage Backed Securities (MBS)

The MBS market was a key element in the financial crisis of 2007-2008

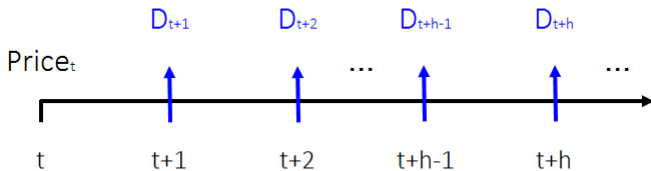
Bond Market: Outstanding Debt

U.S. Bond Market Size (\$ Trillion) as of December/2015



Source: *The Securities Industry and Financial Markets Association (SIFMA)*

Equity Market: Cash Flows



Equity Market: Securities

Common Stocks = Ownership shares in a Corporation

Stockholder \Rightarrow Board of Directors \Rightarrow Managers \Rightarrow Daily decisions

Voting x Non-Voting shares

Stockholders receive the “residual claim”

Firms operate as “limited liability” organizations

Preferred Stocks = Ownership to Fixed Stream of Income from Firm

Hybrid security: Equity & Bond characteristics

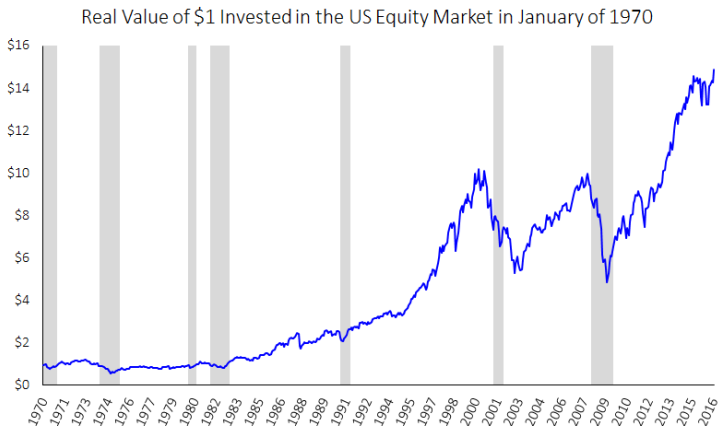
Cash flow priority over common stocks, but no voting power

ADRs = Certificates of Ownership in shares of Foreign Firms

ADR: American Depository Receipt

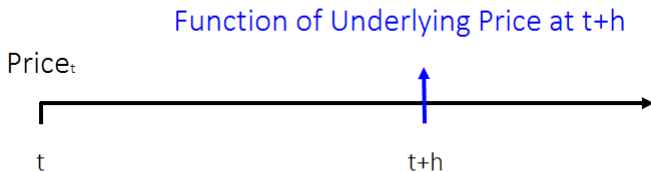
Most common way U.S. investors trade shares of foreign firms

Equity Market: Performance

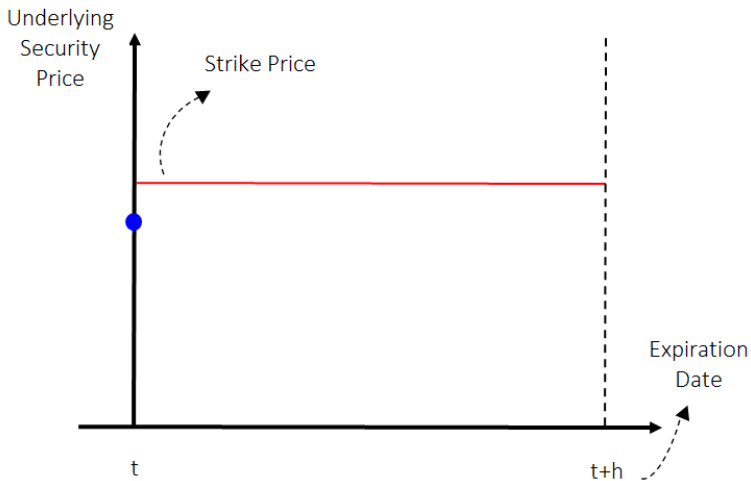


Source: *The Center of Research in Security Prices and The Federal Reserve System of Saint Louis*

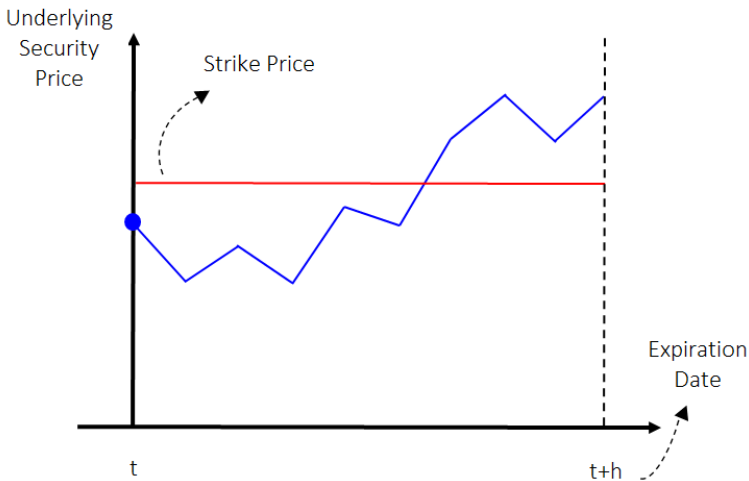
Derivatives Market: Cash Flows



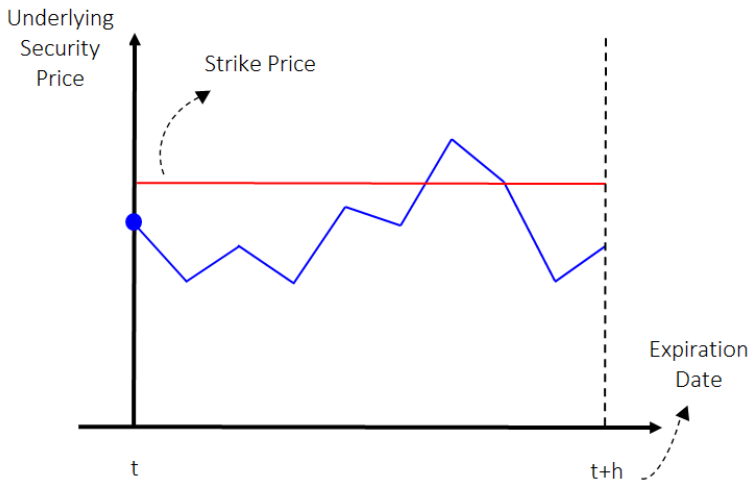
Derivatives Market: Options



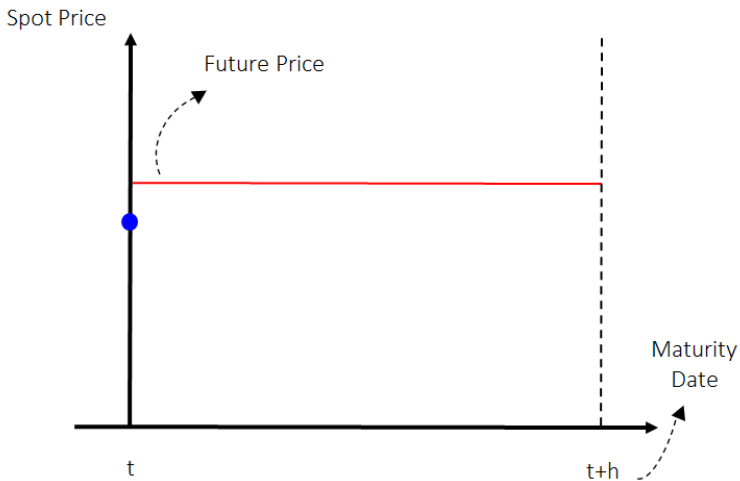
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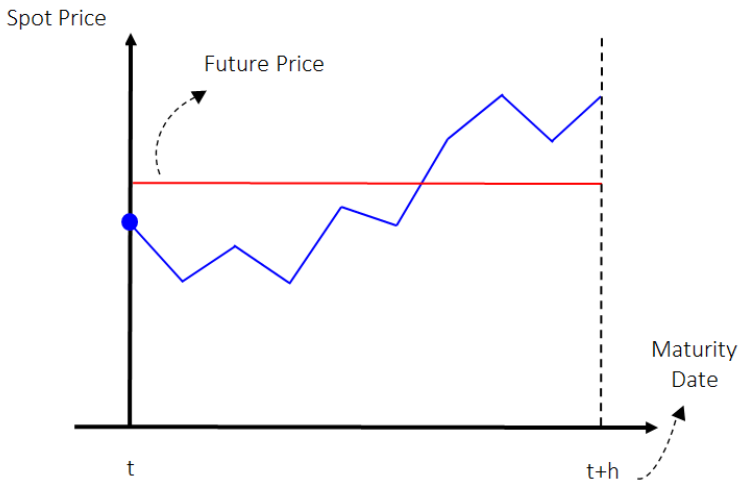
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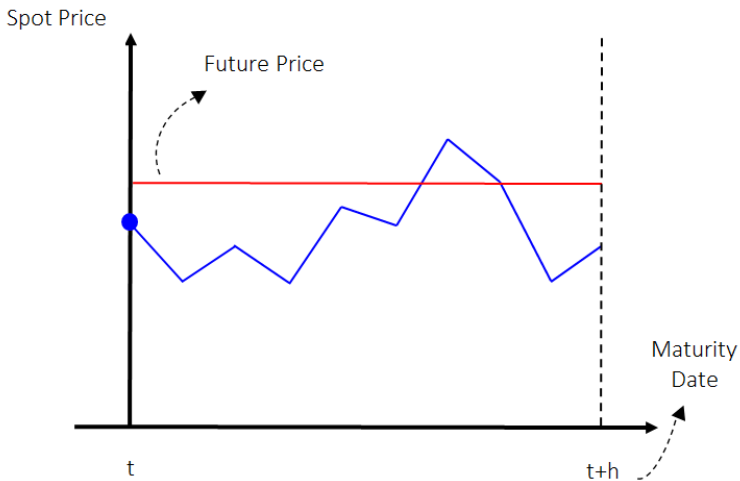
Derivatives Market: Futures



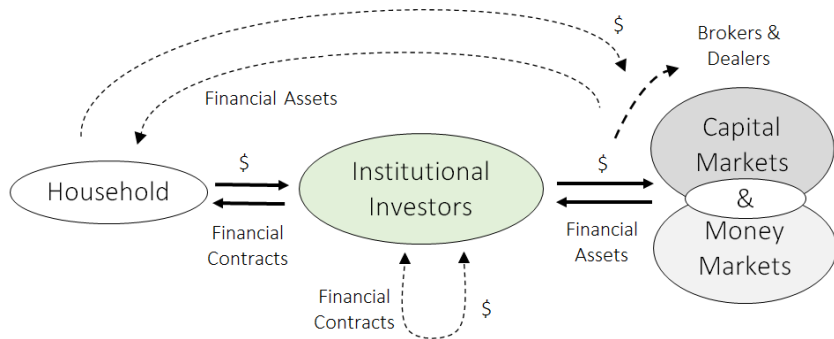
Derivatives Market: Futures



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Role of Institutional Investors



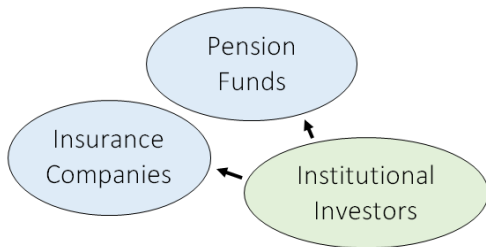
$$\text{Net Asset Value} = \frac{\text{Assets} - \text{Liabilities}}{\text{Shares Outstanding}}$$

Main Institutional Investors



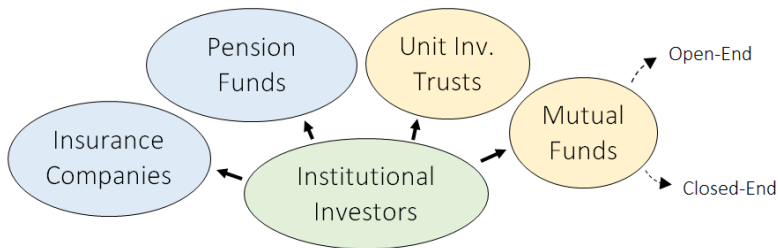
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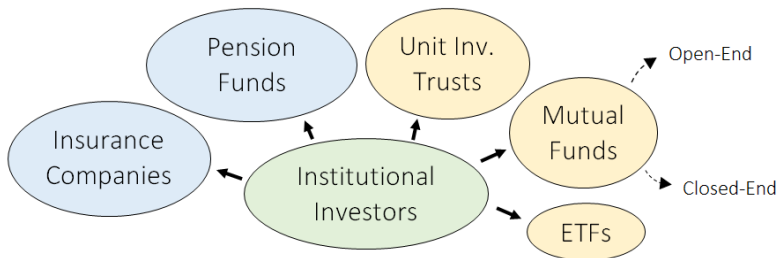
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Main Institutional Investors



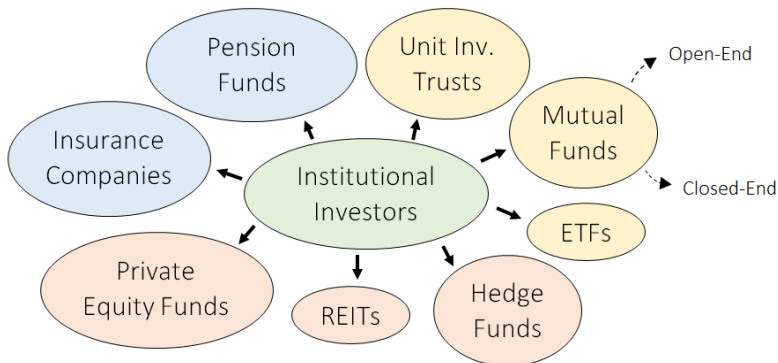
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Size of Institutional Investors in US Stock Market

Table: Institutional Investors & Stock Market (from 13F files)

Period	# of Institutions	% of Market Held	AUM (\$ billion)	
			Median	90th Percentile
1980-1984	539	35%	0.34	2.68
1985-1989	769	41%	0.41	3.64
1990-1994	965	46%	0.41	4.64
1995-1999	1,298	51%	0.47	6.76
2000-2004	1,776	57%	0.37	6.15
2005-2009	2,414	65%	0.34	5.50
2010-2014	2,802	63%	0.33	5.55

Source: "Kojien & Yogo (2016) - An Equilibrium Model of Institutional Demand and Asset Prices"

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Table: Investment Companies AUM as of December 2015

Inv. Company Class	AUM (\$ Trillion)	% of Total AUM
Exchange-Traded Funds	\$ 2.1	11.6%
Unit Investment Trusts	\$ 0.09	0.5%
Closed-End Mutual Funds	\$ 0.26	1.4%
Open-End Mutual Funds	\$ 15.65	86.5%

Source: Investment Company Institute, *2016 Investment Company Fact Book*

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Money Market Funds	2.75	17.6%
Hybrid Funds	1.34	8.6%
Bonds Funds	3.41	21.8%
Investment Grade	1.51	9.6%
High Yield	0.33	2.1%
Global/International	0.43	2.7%
Government	0.27	1.7%
Municipal	0.28	1.8%
Multisector	0.59	3.8%

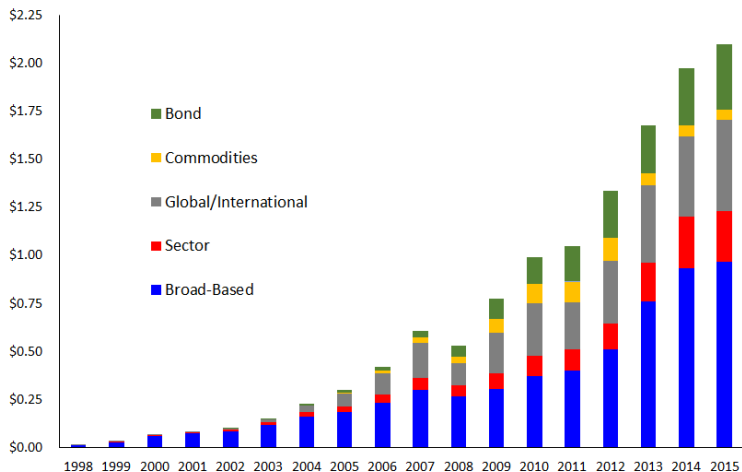
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Global/International	0.43	2.7%
Government	0.27	1.7%
Municipal	0.28	1.8%
Multisector	0.59	3.8%
Equity Funds	8.15	52.1%
Growth	1.84	11.8%
Global/International	2.10	13.4%
Total Return	4.20	26.8%

Source: Investment Company Institute, *2016 Investment Company Fact Book*

ETF Assets Under Management (\$ Trillion)



Source: Investment Company Institute, *2016 Investment Company Fact Book*

Mutual Funds: Fee Structure

Operating Expenses

Costs of operating portfolio + advisory fees

Recordkeeping, custodial service, legal costs, accounting fees...

0.2% to 2% of NAV (aggregate around 0.80%)

Deducted from NAV directly

Front and Back-end load

Sales charge (front-end) and redemption fee (back-end)

Back-end load give incentive to long-term commitments

No-load funds → no sales charge

12b-1 Charges (no larger than 1%)

Market and (or distribution) fee (not all funds have this)

Mostly used to reward intermediaries for selling fund's share

No-load funds → can have at most 0.25% of 12b-1

Mutual Funds: Fee Impact

Table: Performance of 5 Funds with Gross Return of 12% per year

Period	0.15% OER ETF	1% OER No-Load	1% OER +0.5% 12b-1	1% OER 6% Front-end	1% OER 6% Back-end
Initial Investment	\$ 1.00	\$ 1.00	\$ 1.00	\$ 0.94	\$ 1.00
+ 1 year	\$ 1.12	\$ 1.11	\$ 1.11	\$ 1.04	\$ 1.05
+ 2 years	\$ 1.25	\$ 1.23	\$ 1.22	\$ 1.16	\$ 1.18
+ 3 years	\$ 1.40	\$ 1.37	\$ 1.35	\$ 1.29	\$ 1.33
+ 4 years	\$ 1.57	\$ 1.52	\$ 1.49	\$ 1.43	\$ 1.49
+ 5 years	\$ 1.75	\$ 1.69	\$ 1.65	\$ 1.58	\$ 1.67
+ 10 years	\$ 3.06	\$ 2.84	\$ 2.71	\$ 2.67	\$ 2.84
+ 15 years	\$ 5.36	\$ 4.78	\$ 4.47	\$ 4.50	\$ 4.78
+ 20 years	\$ 9.39	\$ 8.06	\$ 7.37	\$ 7.58	\$ 8.06

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+ 2 years	\$ 1.25	\$ 1.23	\$ 1.22	\$ 1.16	\$ 1.18
+ 3 years	\$ 1.40	\$ 1.37	\$ 1.35	\$ 1.29	\$ 1.33
+ 4 years	\$ 1.57	\$ 1.52	\$ 1.49	\$ 1.43	\$ 1.49
+ 5 years	\$ 1.75	\$ 1.69	\$ 1.65	\$ 1.58	\$ 1.67
+ 10 years	\$ 3.06	\$ 2.84	\$ 2.71	\$ 2.67	\$ 2.84
+ 15 years	\$ 5.36	\$ 4.78	\$ 4.47	\$ 4.50	\$ 4.78
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Mutual Funds: Fee Impact

Table: Performance of 5 Funds with Gross Return of 12% per year

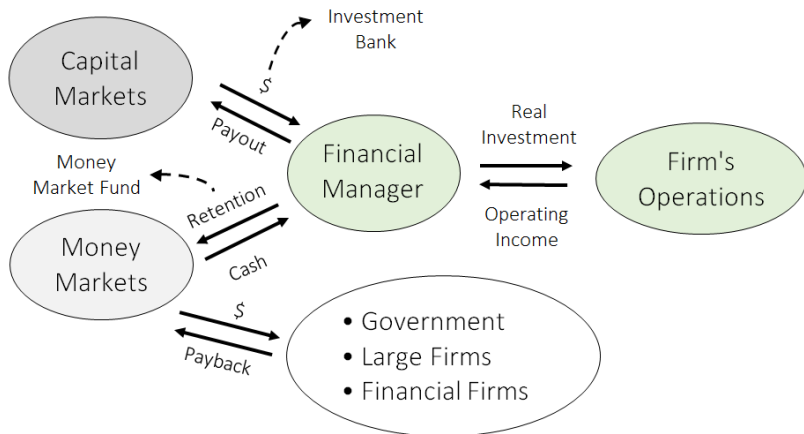
Period	0.15% OER ETF	1% OER No-Load	1% OER +0.5% 12b-1	1% OER 6% Front-end	1% OER 6% Back-end
Initial Investment	\$ 1.00	\$ 1.00	\$ 1.00	\$ 0.94	\$ 1.00
+ 1 year	\$ 1.12	\$ 1.11	\$ 1.11	\$ 1.04	\$ 1.05
+ 2 years	\$ 1.25	\$ 1.23	\$ 1.22	\$ 1.16	\$ 1.18
+ 3 years	\$ 1.40	\$ 1.37	\$ 1.35	\$ 1.29	\$ 1.33
+ 4 years	\$ 1.57	\$ 1.52	\$ 1.49	\$ 1.43	\$ 1.49
+ 5 years	\$ 1.75	\$ 1.69	\$ 1.65	\$ 1.58	\$ 1.67
+ 10 years	\$ 3.06	\$ 2.84	\$ 2.71	\$ 2.67	\$ 2.84
+ 15 years	\$ 5.36	\$ 4.78	\$ 4.47	\$ 4.50	\$ 4.78
+ 20 years	\$ 9.39	\$ 8.06	\$ 7.37	\$ 7.58	\$ 8.06

Mutual Funds: Fee Impact

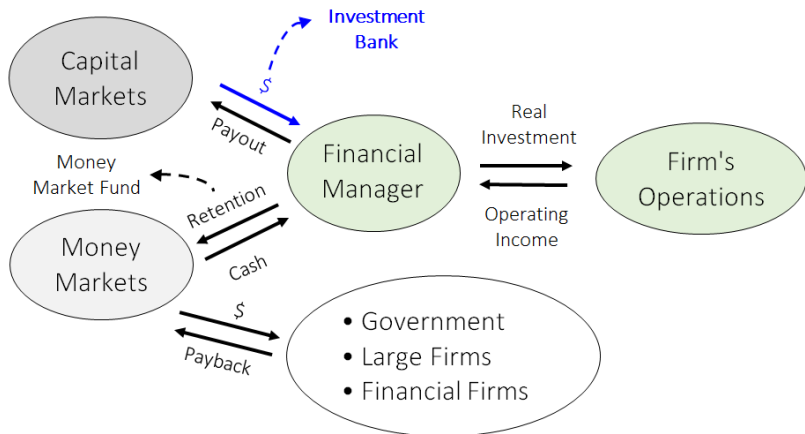
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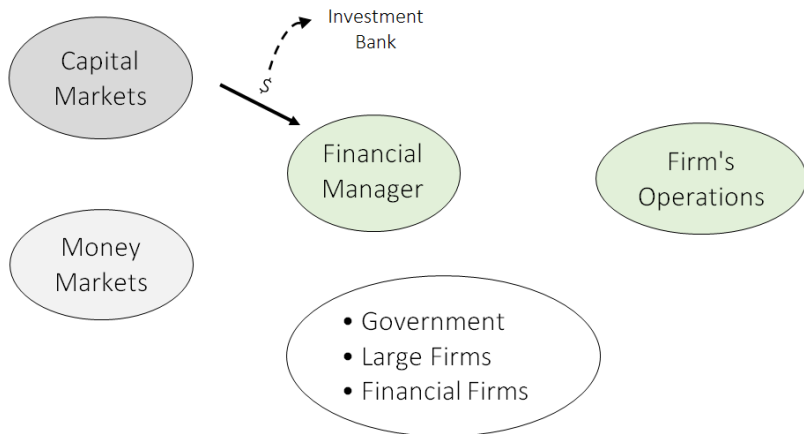
Firm's Perspective: Issuing Securities



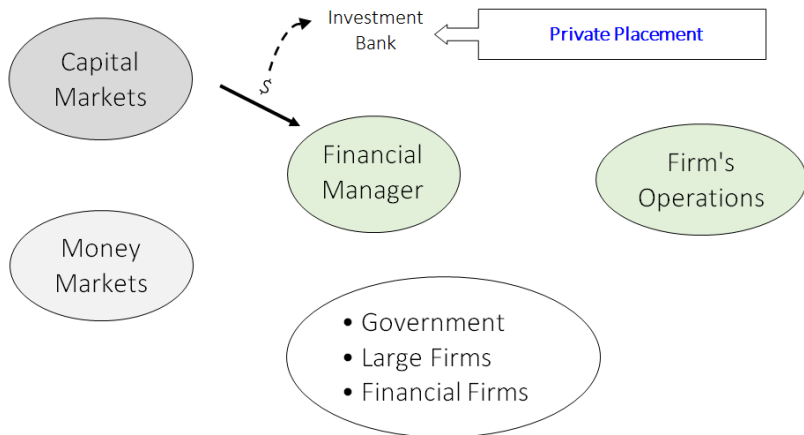
Firm's Perspective: Issuing Securities



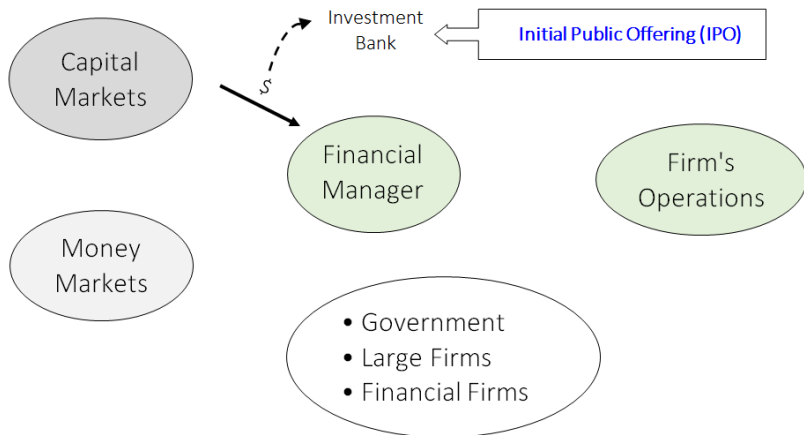
Firm's Perspective: Issuing Securities



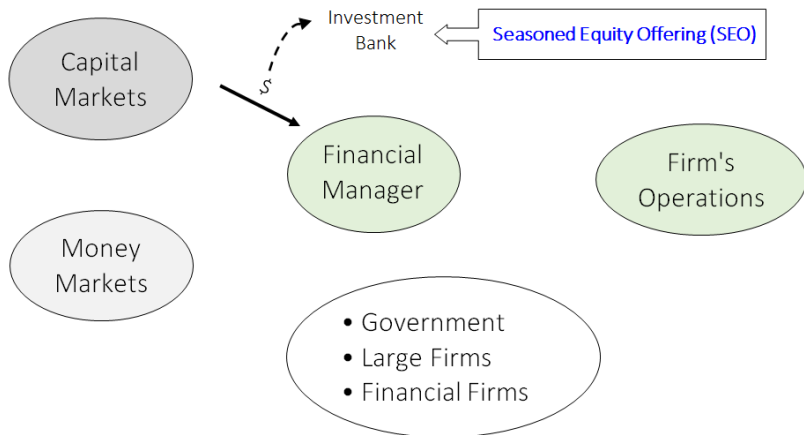
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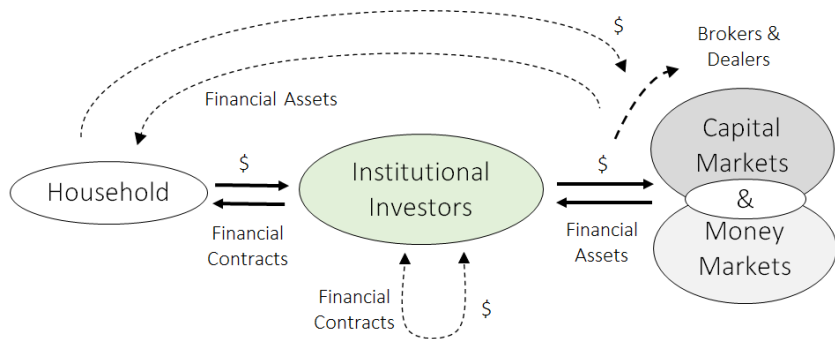
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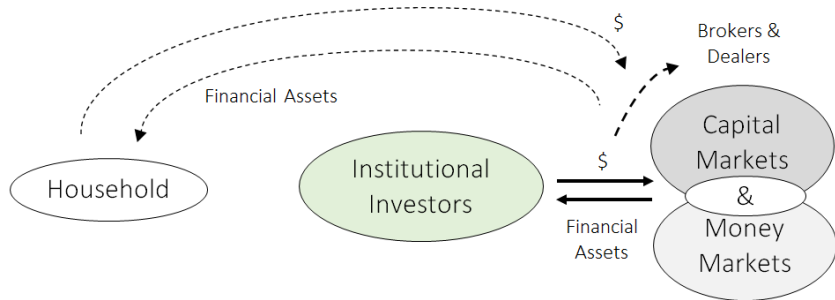
Firm's Perspective: Issuing Securities



Investor's Perspective: Trading Securities



Investor's Perspective: Trading Securities



Investor's Perspective: Types of Markets

Brokered Markets

Real Estate and Primary Markets are important examples

Brokers conduct searches for a fee (typically expensive)

Brokers have specialized knowledge on valuing these traded assets

Dealer Markets or Over the Counter (OTC) Markets

Most bonds and derivatives are traded in OTC markets

Trader → Broker → Dealer bid & ask prices

Dealers hold inventories and can leave the market

Proprietary Electronic Platforms (e.g., MarketAxess multi-dealer platform)

Trade Reporting and Compliance Engine (TRACE) for bond prices

Auction Markets

Specialist Markets x Electronic Communication Networks (ECNs)

Public stocks are mostly traded in ECNs nowadays (with exceptions)

NASDAQ stocks were originally traded in a OTC market

NYSE stocks were originally traded in a specialist market

Investor's Perspective: Liquidity & Types of Orders

Table: Limit Order Book for FedEx (on NYSE Arca market)

BID			ASK		
Price	Size	Time	Price	Size	Time
90.04	100	14:05:22	90.05	400	14:05:21
90.03	302	14:05:25	90.06	104	14:05:21
90.02	204	14:05:25	90.07	303	14:05:21
90.01	1604	14:05:17	90.08	303	14:05:18
90.00	302	14:05:18	90.09	303	14:05:18
89.99	403	14:05:21	90.10	404	14:04:55
89.98	1003	14:05:14	90.11	404	14:04:00
89.97	1103	14:05:20	90.12	802	14:05:23

Source: New York Stock Exchange Euronext, www.nyse.com, June 22, 2012

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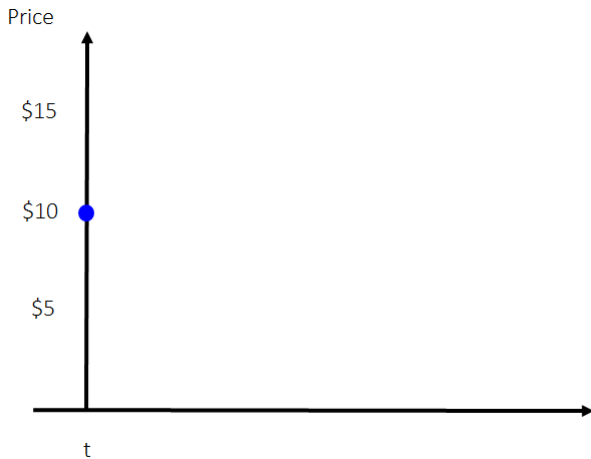
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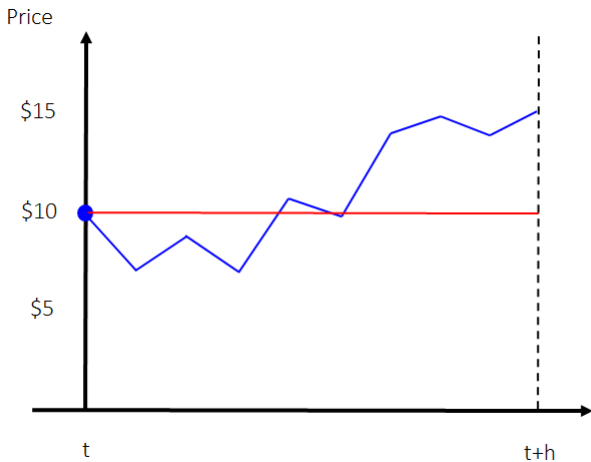
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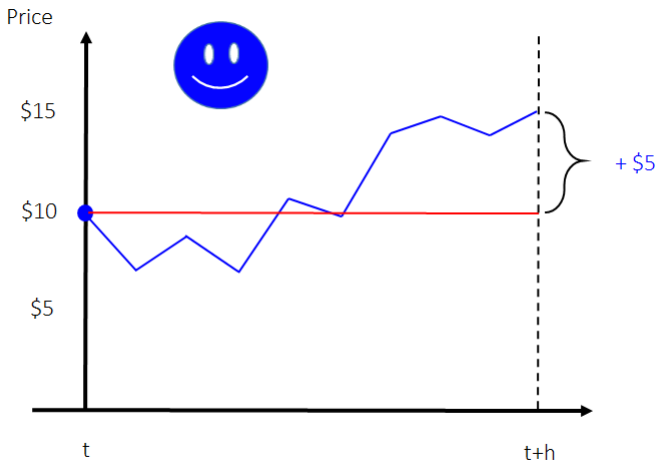
Investor's Perspective: Long Position



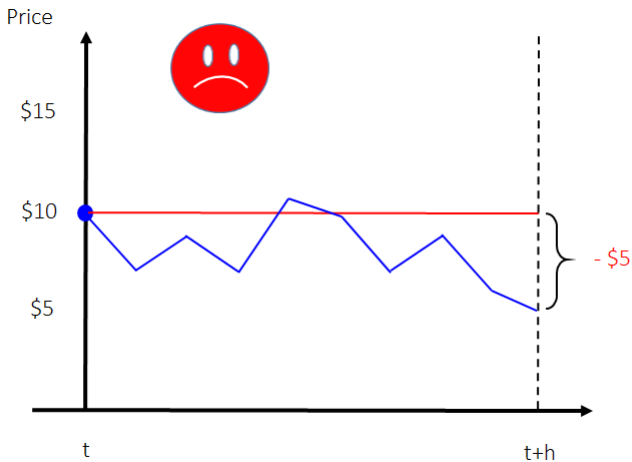
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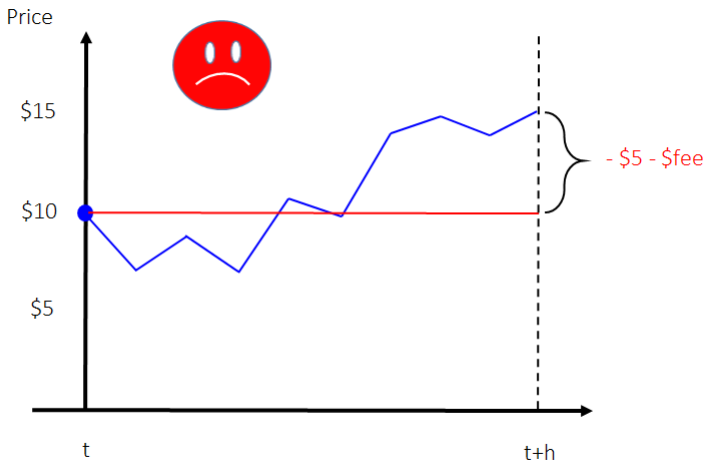
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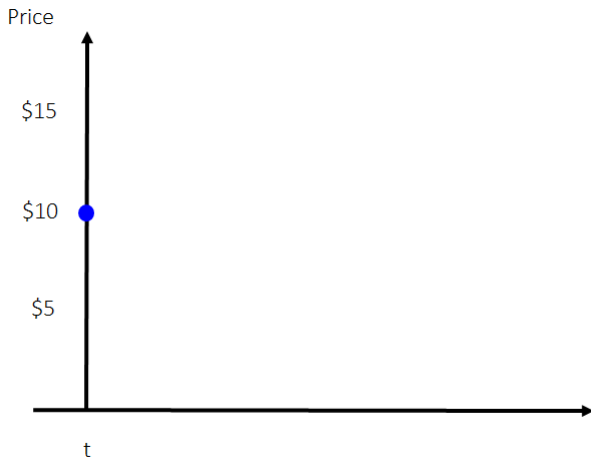
Investor's Perspective: Short Position



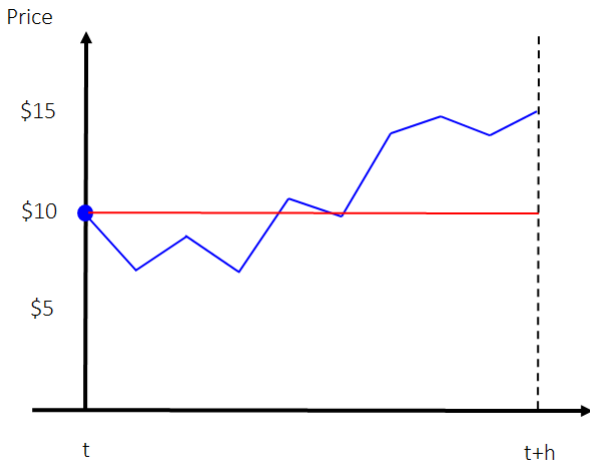
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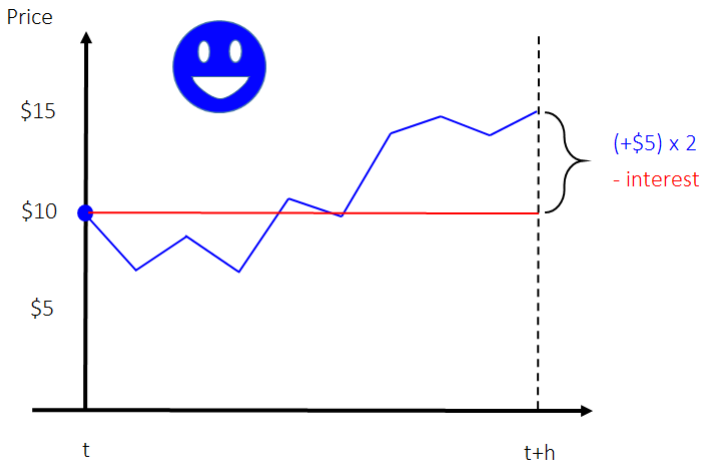
Investor's Perspective: Buying on Margin



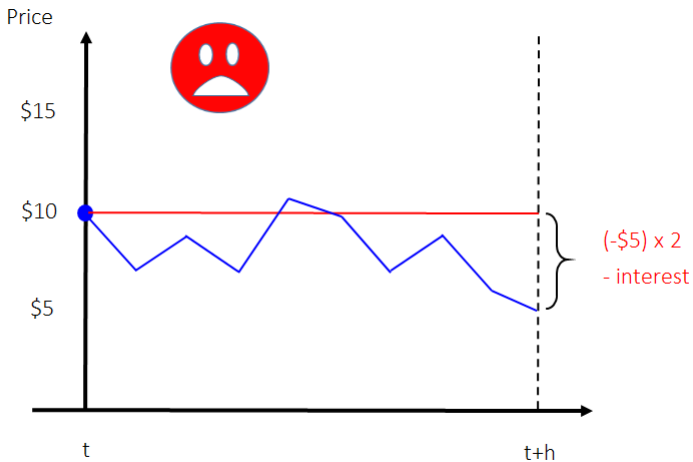
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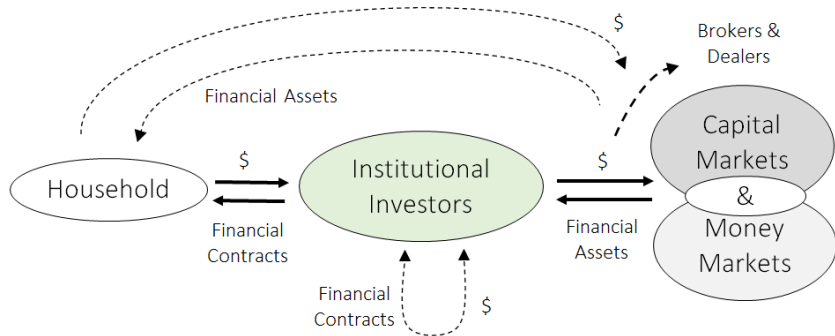
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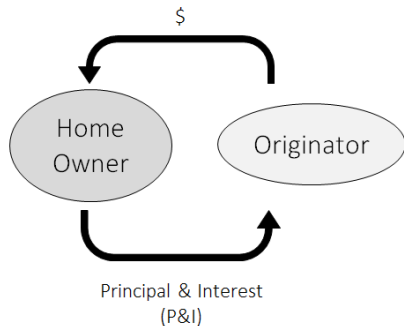
Investor's Perspective: Buying on Margin



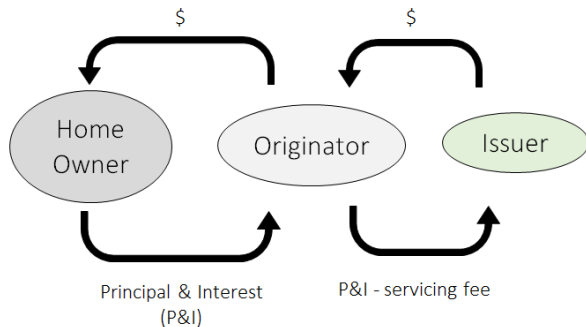
Disruption in the Supply of Capital System



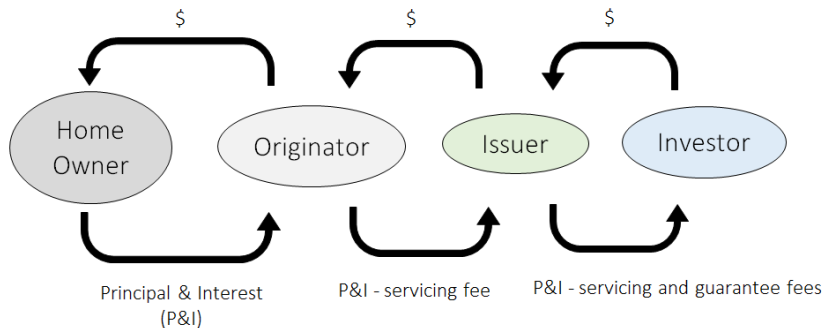
Conforming (or “Agency”) MBS



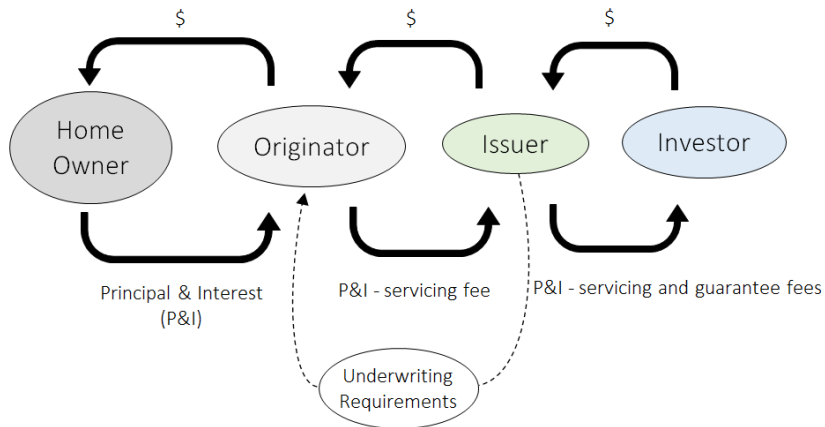
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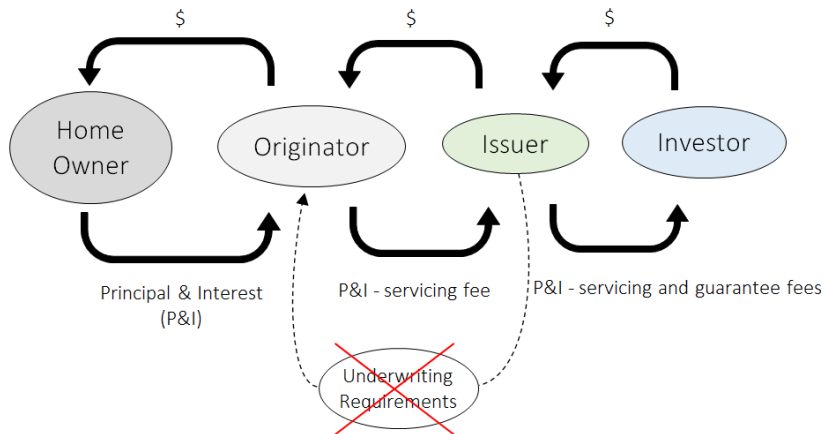
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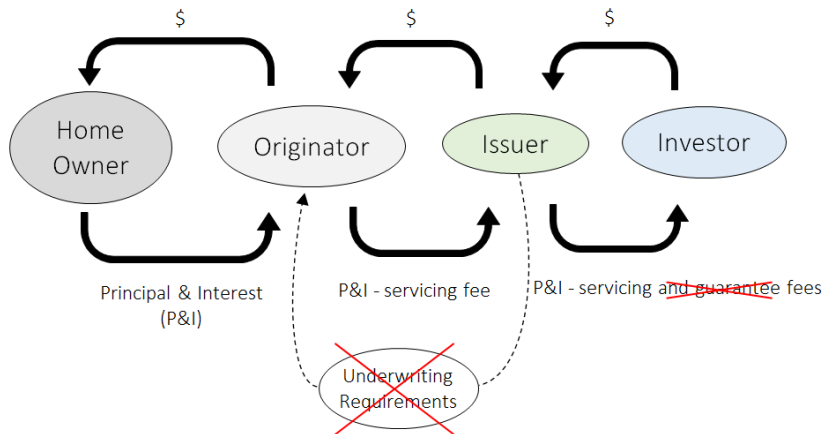
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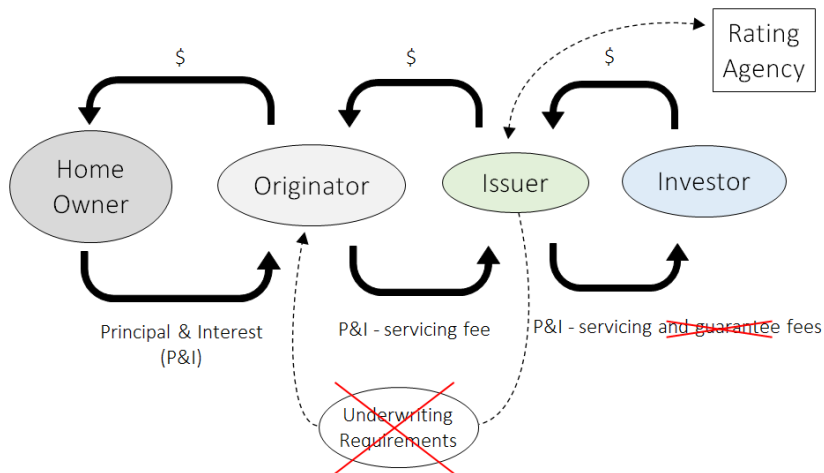
Non-Conforming (or “Private-Label”) MBS



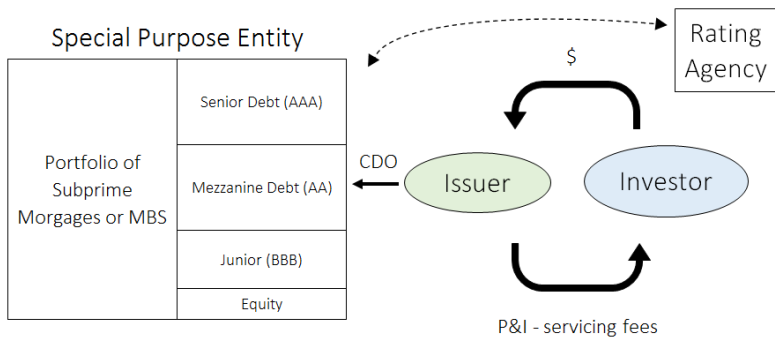
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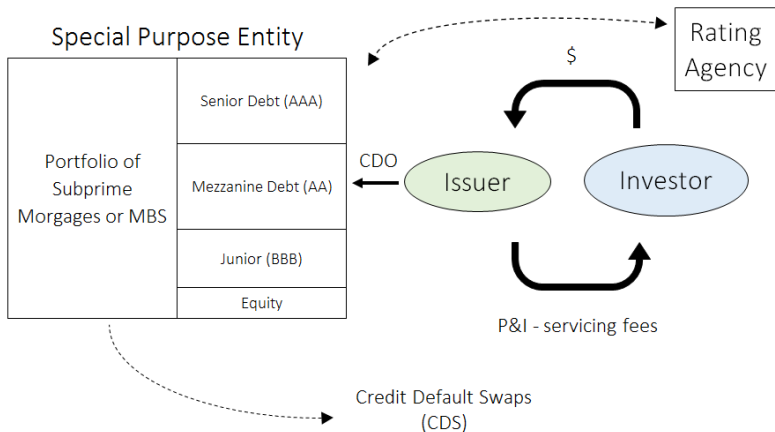
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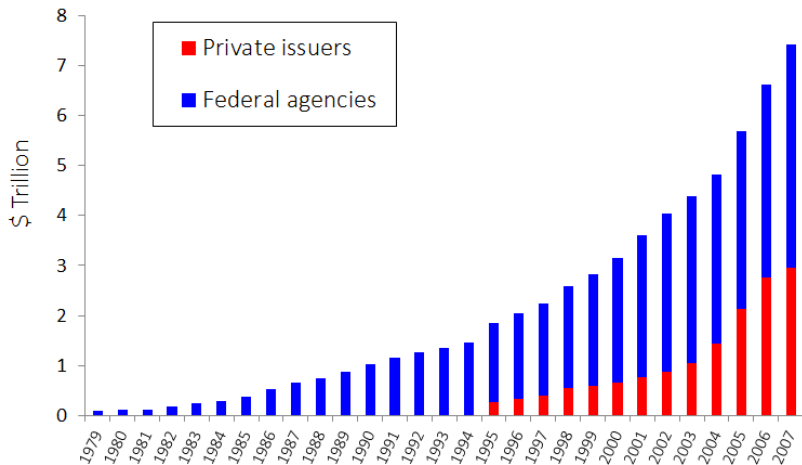
Collateralized Debt Obligation (CDO)



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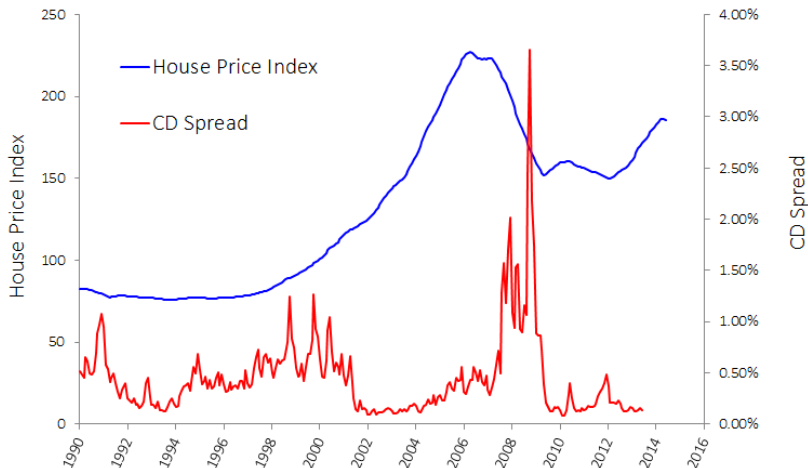


Mortgage-Backed Securities Outstanding (\$ Trillion)



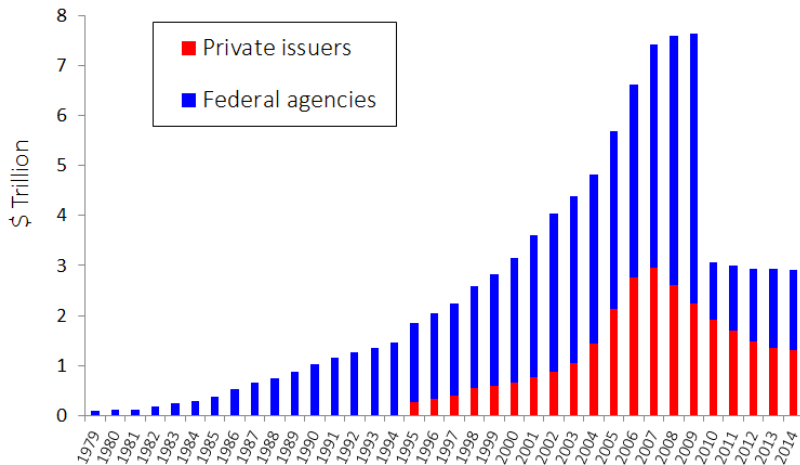
Source: *Flow of Funds Accounts of the U.S., Board of the Federal Reserve System*

House Price Index and CD Spread



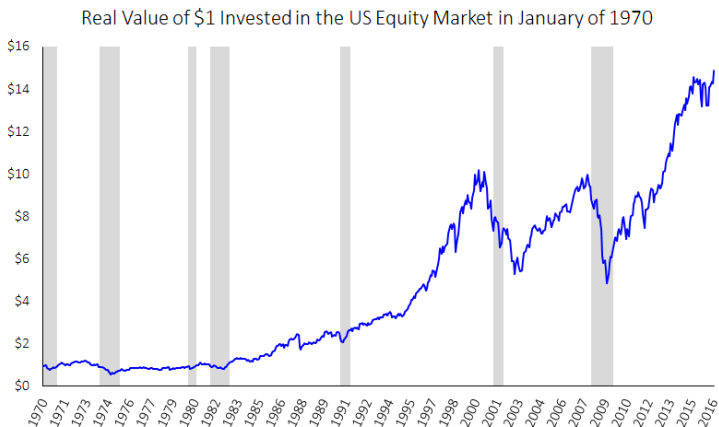
Source: Federal Reserve System of Saint Louis and Case-Shiller Index of U.S. housing prices

Mortgage-Backed Securities Outstanding (\$ Trillion)



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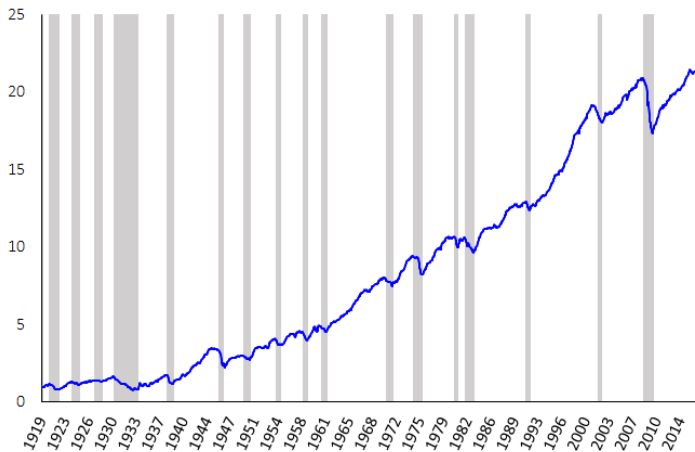
Equity Market Drop during 2007-08 Financial Crisis



Source: *The Center of Research in Security Prices and The Federal Reserve System of Saint Louis*

Industrial Production Drop during 2007-08 Financial Crisis

Normalized U.S. Industrial Production



Source: Federal Reserve System of Saint Louis

