Suggested readings

- Houthakker, Hendrik S. & Williamson, Peter J., 1996. The Economics of Financial Markets, Oxford University Press.

- Saunder, A & Cornett, M.M., 2019. Financial Markets & Institutions - An Introduction to the Risk Management Approach, 3rd Edition, The McGraw-Hill/Irwin.

- Brigham, E F. & Houston, J.F., 2016. Fundamentals of Financial Management, Concise Edition-South-Western College Publications.

- Fabozzi, F.J., Modigliani, F.P. & Jones, F.J., 2009. Foundations of Financial Markets and Institutions, Pearson Publishers.

- Related articles/research papers will be shared.

The financial markets are not the whole economy!

► We are better at creating new claims on wealth than wealth itself….!

► Winston Churchill famously said that he would "rather see finance less proud and industry more content".

► A lot of people might be happier if the stock market was less buoyant and the average standard of living was more so.

Financial Markets-Introduction

- Financial Markets
  - Market in Narrow sense is referred to as a central trading places
  - In Economics, the word 'market' has a wider meaning - India's labor market, capital market etc.
  - We, in this course, are concerned with markets in the narrow, historical sense.
  - The stock exchanges and the futures markets are important examples; in both the physical proximity of buyers and sellers (possibly represented by middlemen) is essential to the trading process.
  - However, there are other important financial markets that do not have central trading places yet share many features with markets in the narrow sense.
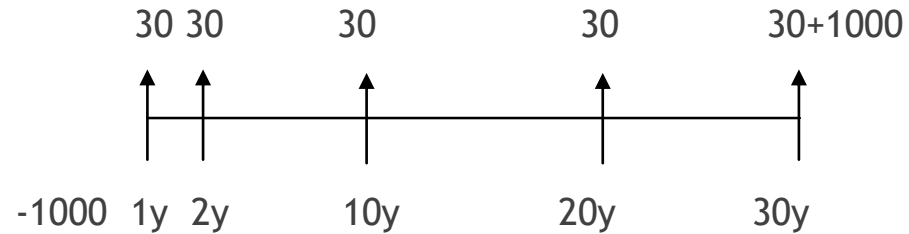
- Financial Instruments
  - Real Assets and Financial Claims
  - Financial claims are readily negotiable claims
  - A highly competitive market is not one in which there is a single price for every item traded. Contrarily, normally two prices: the bid price, and the offer (ask) price; *the bid-ask spread; and it should be small*.
  - However, by no means do all claims satisfy the criterion of ready negotiability- Closely held

- **Accounting requirements**
  - In accounting we find two kinds of statements:
    - Stock statements: The balance Sheet
    - Flow statements: Cash flow and Income Statements

The Price of a Financial Asset and Returns

▶ Price of any financial asset is equal to the present value of its expected cash flow, even if the cash flow is not known with certainty.

▶ For example, GOI Bond pays Rs 30 every year

▶
```
           30 30        30          30         30+1000
            ↑  ↑         ↑           ↑            ↑
            |──|─────────|───────────|────────────|
      -1000 1y 2y       10y         20y          30y
```

▶ With the expected cash flow of a financial asset and its price, expected rate of return can be obtained.

▶ For example,

   ▶ Bond price - Rs. 100

   ▶ cash flow - Rs.105

   ▶ Maturity – 1 year

   ▶ (105-100)/100 = 0.05 or 5%

▶ The type of financial asset and the characteristics of the issuer determine the degree of certainty of the expected cash flow.

Financial returns-some basics

- **'Sharpe Ratio'-** measure of risk-adjusted return of a financial portfolio.

- The measure was named after *William F Sharp*.

- $= [R(p) – R(f)] / s(p)$

  - Where, $R(p)$: Portfolio return, $R(f)$: Risk free rate of return, and $s(p)$: Standard deviation of the portfolio

- Portfolio diversification with assets having low to negative correlation tends to reduce the overall portfolio risk and consequently increases the Sharpe ratio.

- For instance,

  - a portfolio has 50% equity and 50% bonds; return = 20%; standard deviation = 10%. Assuming the risk-free rate to be 5%.

  - Sharpe ratio = [(20%-5%)/10%] = 1.5

  - Let's add another asset class to the portfolio, namely a hedge fund and tweak the portfolio allocation to 50% in equity, 40% in bonds and 10 %in the hedge fund.

  - The portfolio return becomes 25 % and standard deviation remains at 10 %.

  - New Sharpe ratio = [(25%-5%)/10%]= 2 (improved!)

- However, the Sharpe ratio is a relative measure of risk-adjusted return. It does not provide much information about the fund's performance.

  - The measure considers standard deviation, which assumes a symmetrical distribution of returns.

  - For asymmetrical return distribution?

  - Investors are only concerned about the downward volatility. Standard deviation doesn't accurately measure the downside risk

- Therefore, *Sortino'* **ratio** is proposed.

▶ **'Sortino Ratio'-** measures the performance of the investment relative to the downward deviation.

▶ Unlike Sharpe, it doesn't take into account the total volatility in the investment.

▶ *Named after Frank A Sortino*

▶ **Sortino Ratio = ([*R(p)* – R(f)] /SD)**

  ▶ where, (R): Expected return; Rf: Risk free rate of return; SD: Standard deviation of the Negative Asset Return

▶ Higher the ratio, lower is the probability of downside deviation.

▶ What is the use of it?

  ▶ Suppose,

    ▶ Scheme A returns = 15%; its downside deviation is 13% and Scheme B returns = 10%; its downside deviation is 4%.

    ▶ Consider the risk-free returns of 7%.

    ▶ Sortino A = 0.61 ((15% - 7%)/13%); Sortino B = 0.75.

    ▶ Scheme B is better

Finance-Introduction

- Finance has four important functions:
  - operating the payments system;
  - channelling funds from savers to the corporate sector;
  - providing liquidity to the market by buying and selling assets; and
  - helping the rest of society to manage risks, both financial and non-financial.
- So one can justify all the activity—the endless multiplication of funds and instruments or the frenetic trading activity—along these grounds.
- More liquid asset markets potentially lower the cost of capital; the creation of instruments such as derivatives allow risk to be allocated more efficiently, to those who have the appetites (and balance sheets) to handle it.

Flows of Funds Through the Financial System
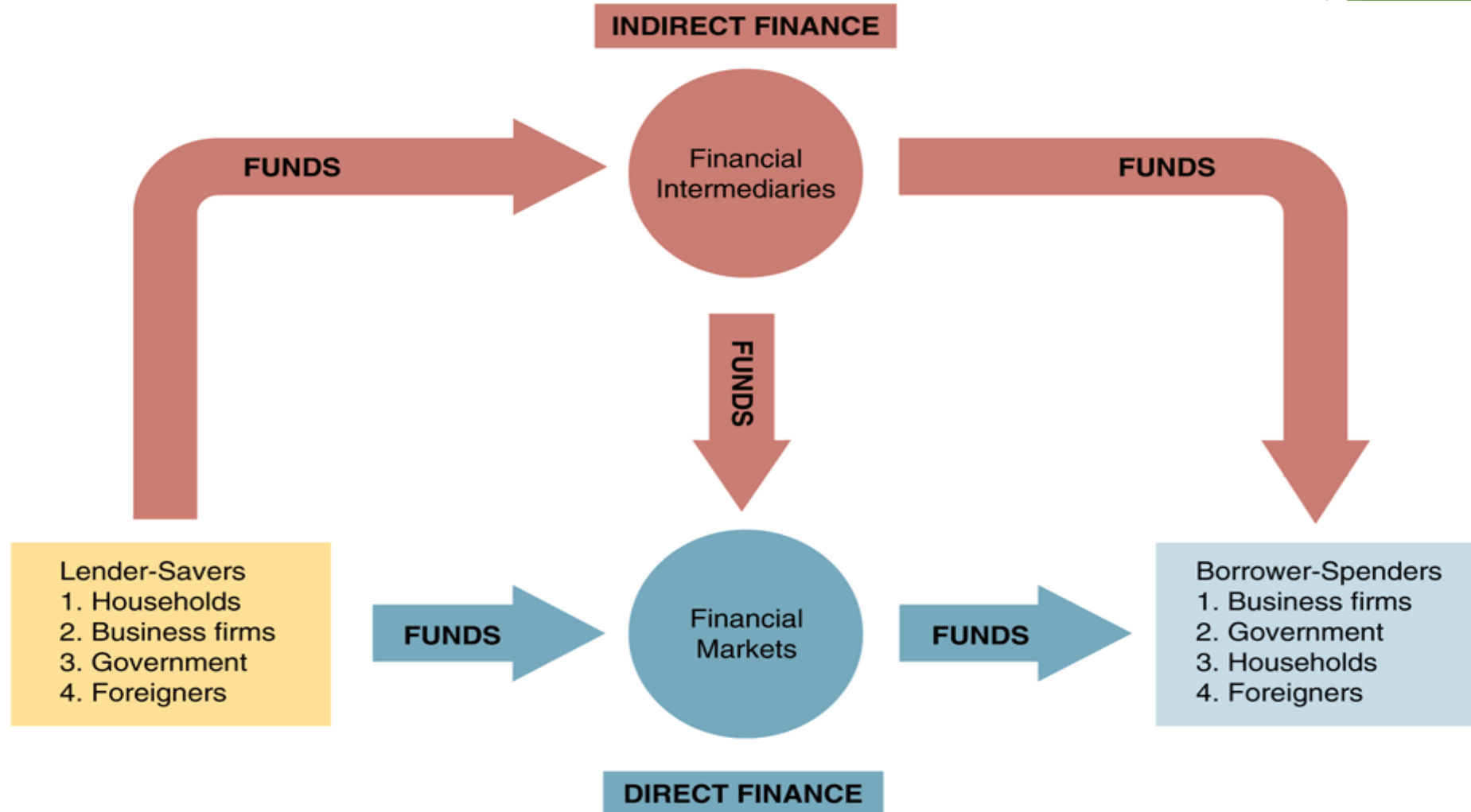
Role of Financial Assets/instruments

▶ The two principal economic functions:

1. To transfer funds: surplus to deficient

2. To redistribute the unavoidable risk: the cash flow generated by tangible assets

Role of Financial Markets

- Additional three economic functions

  3. Price Discovery Process

  4. Provides Liquidity

  5. Reduces the cost of transaction:

     a. Search Costs: Explicit (money) and implicit (time)

     b. Information Costs: assessing the investment merits of a financial asset

Role of Financial Institutions

▶ Financial intermediaries obtain funds by issuing financial claims against themselves to market participants, and then investing those funds.

▶ Direct Investments vs Indirect Investments

▶ Transformation involves at least one of the four economic functions:

    a. Providing maturity intermediation(Short term Deposits and long term Loans)- It has implications for the market (more choices and lower cost of long term borrowing)

    b. Reducing Risk via diversification (Investing in multiple firms)

    c. Reducing the cost of contracting and information processing (Cost of enforcement of a loan contract and cost of acquiring the information for an investor)

   d. Providing a payment mechanism (Cheques, Cards, Electronic transfer)

- Why financial intermediaries and indirect finance play an important role in financial markets??

  - The presence of transaction costs in financial markets partly explains about it

  - And information inequality-*asymmetric information*

    - Creates problems in the financial system on two fronts: before and after the transaction

- Asymmetric information *leads to:*

  - *Adverse selection*

  - *Moral Hazard*

Asymmetric information

- Adverse Selection:
  - The better informed economic agent has a natural incentive to exploit his informational advantage. Those who are uninformed should anticipate their informational handicap and behave accordingly.
  - It occurs at the search/verification stage of the transaction; referred as the 'lemon' problem (Akerlof, 1970).
  - *Solution:* offer a warranty(Signaling) by seller); Screening by the (health insurance) company
  - In banking, adverse selection can occur typically as a result of loan pricing.

Adverse selection in loan pricing
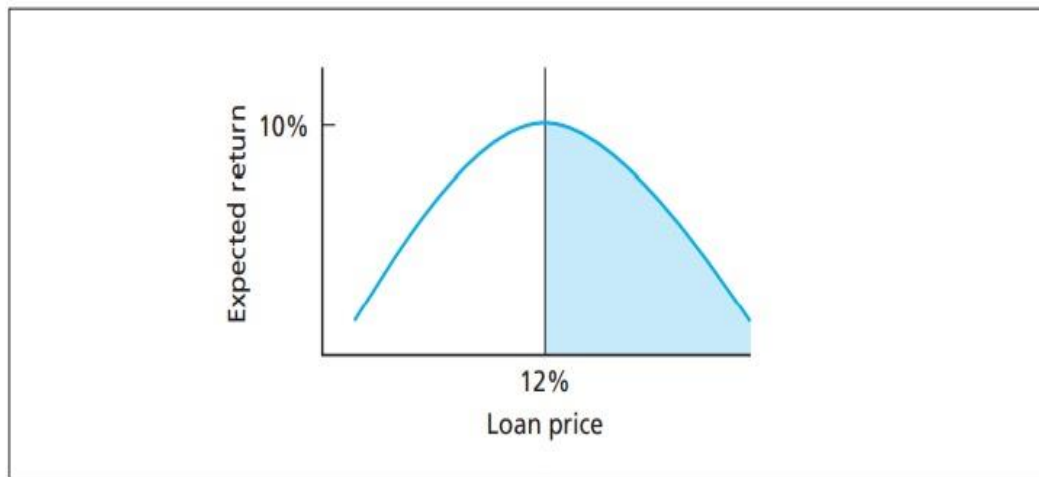
- Moral Hazard:
  - It arises when a contract or financial arrangement creates incentives for parties to behave against the interest of others.
  - In banking: Deposit insurance and the lender-of-last-resort function of the central bank
  - *Solution*: Monitoring, credit ratings and regulations.
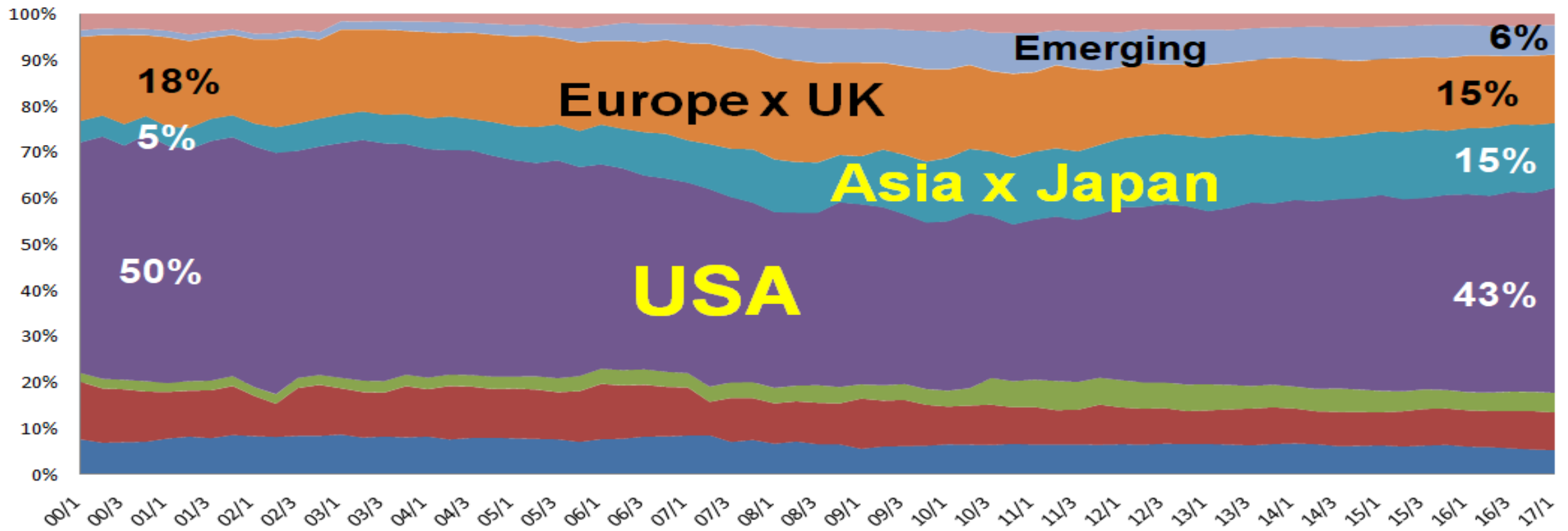
Globalization of Financial Markets

- Before the 1980s, U.S. financial markets were much larger than financial markets outside the U.S.

- U.S. Stock Market Is Biggest & Most Expensive In World, But U.S. Economy Is Not The Most Productive

- World Capital Markets: U.S. is loosing its dominance!
  - Increased interest in foreign stocks
  - Quicker adoption of technological innovations by foreign financial markets
  - Tighter immigration controls in U.S. following 9/2001
  - Sarbanes-Oxley Act of 2002

- Major Instruments
  - *Foreign Bonds*
  - *Eurobond:* Currently, they account foe over 80% of the new issues in the international bond market
    - *Eurocurrencies*
      - *Eurodollars*: They have nothing to do with Euros, currency of European Monetary System.

Are U.S. Capital Markets Losing Their Edge?

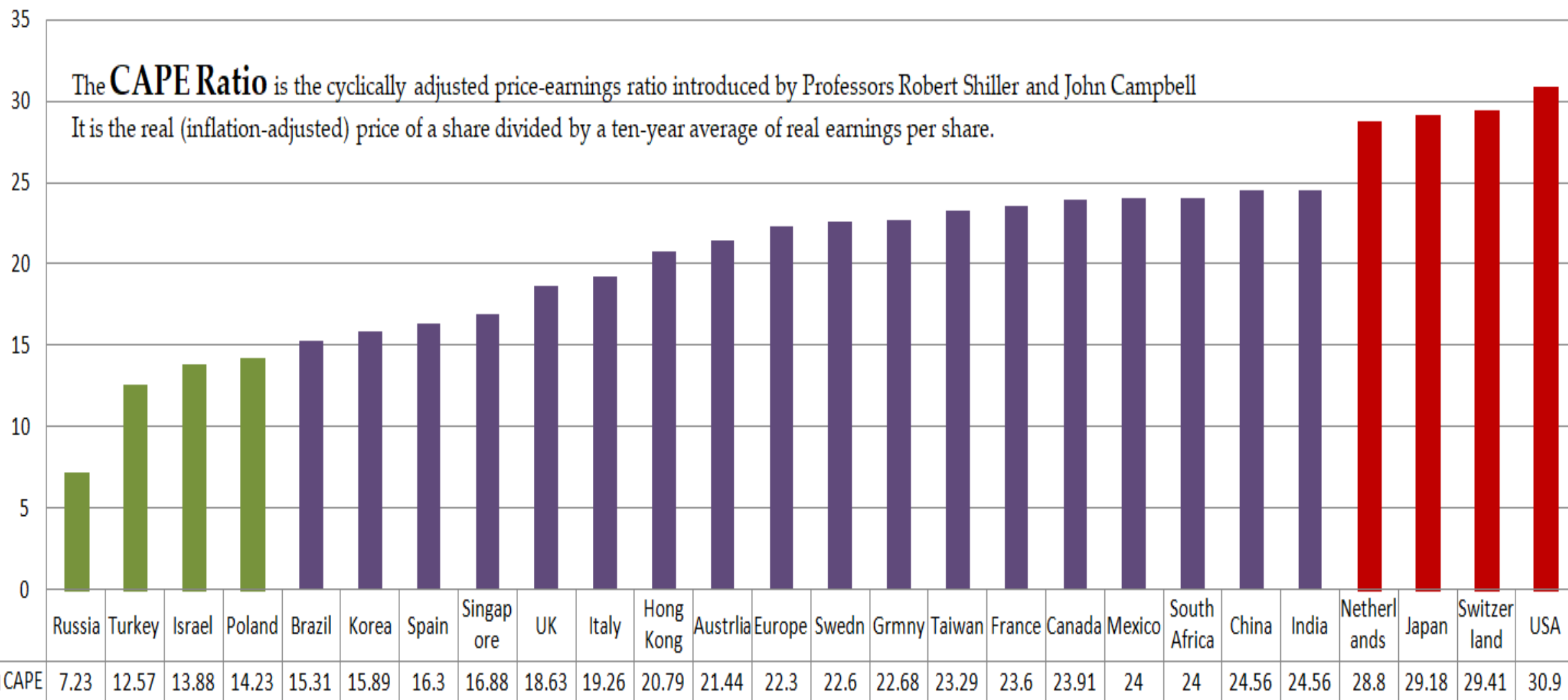

World Stock Market Composition 2000-2017
Source: PPCA Inc

Legend: UK, Japn, Cana, USA, AxJP, ExUK, Emrg, Latn

Europe x UK — 18% / 15%
Emerging — 6%
Asia x Japan — 5% / 15%
USA — 50% / 43%

Current CAPE Ratios

The **CAPE Ratio** is the cyclically adjusted price-earnings ratio introduced by Professors Robert Shiller and John Campbell

It is the real (inflation-adjusted) price of a share divided by a ten-year average of real earnings per share.

|	Russia	Turkey	Israel	Poland	Brazil	Korea	Spain	Singapore	UK	Italy	Hong Kong	Austrlia	Europe	Swedn	Grmny	Taiwan	France	Canada	Mexico	South Africa	China	India	Netherlands	Japan	Switzerland	USA
CAPE	7.23	12.57	13.88	14.23	15.31	15.89	16.3	16.88	18.63	19.26	20.79	21.44	22.3	22.6	22.68	23.29	23.6	23.91	24	24	24.56	24.56	28.8	29.18	29.41	30.9

Source: Barclays Bank

Secondary Source: NASDAQ

2,000 Years of Economic History in One Chart. All Major Powers Compared By GDP From The Year 1 AD. Courtesy of: Visual Capitalist.
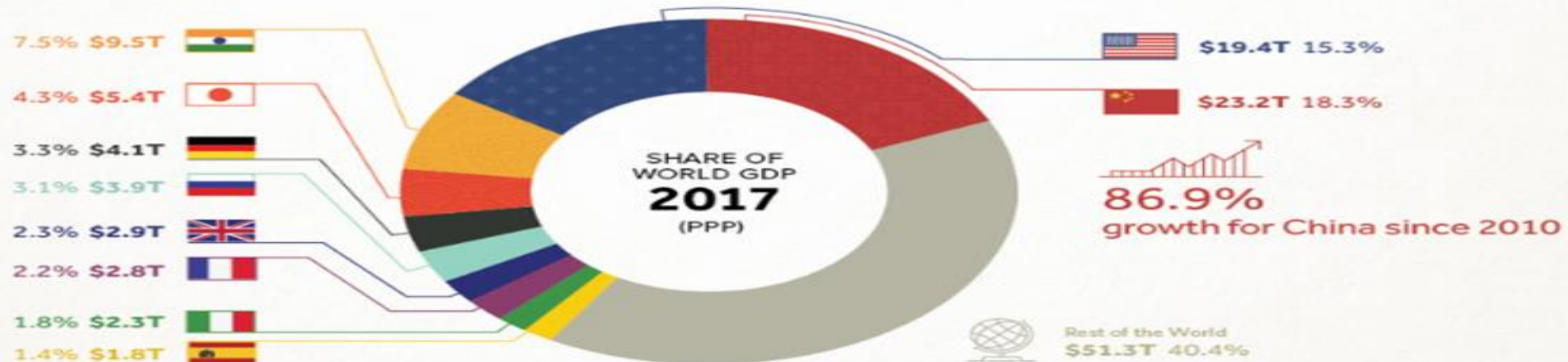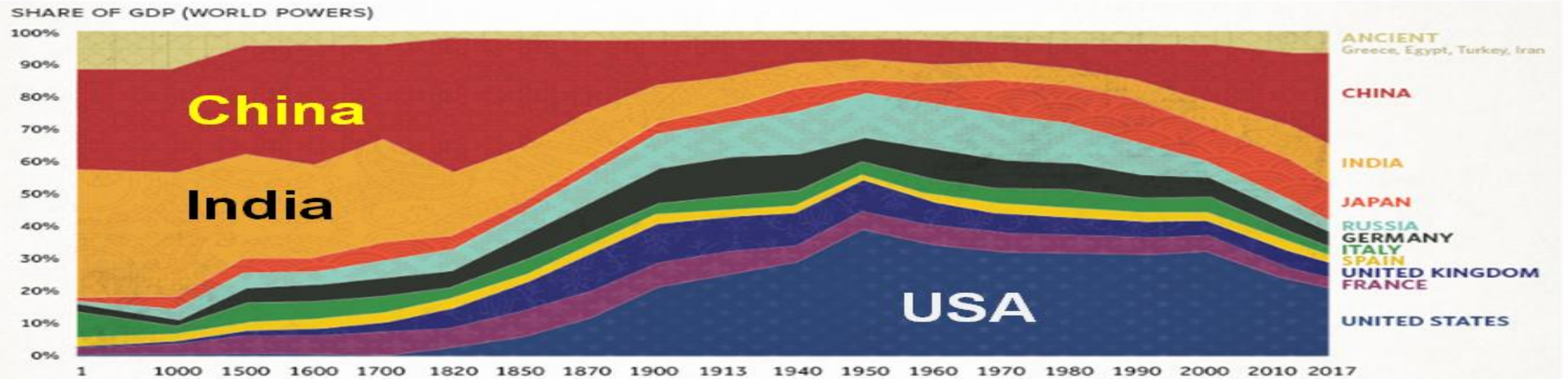
The Supply of Securities

▶ In asset markets, an assessment of the supplier is important as the value of an asset depends on the supplier's performance/behaviour.

  ▶ Example: CAR value

▶ The purchase of a bond/equity is an extreme case of this feature - the physical item exchanged has little or no intrinsic value – the item is good for a wall hanging!!!

  ▶ But financial claims vary in the extent to which their value is ultimately exposed to poor supplier performance.

    ▶ A mortgage, for example, is relatively unexposed but a stock is strongly affected by the actions of its managers and directors

▶ The more crucial actor is the ultimate 'supplier', the issuer of the security, not the investor.

▶ So, need to look at the contractual characteristics of each and how each of them is influenced by the behavior of issuers.

General Characteristics of Securities

- There are four key dimensions across which securities vary:
  - The rupee value of the anticipated return
  - The timing of these returns
  - Their risk characteristics
  - Their negotiability (Liquidity)
- Each of these may be influenced by the issuer's actions
- Our emphasis is on securities as readily negotiable primary financial instruments - bonds/shares but not the derivatives.

- *Government securities share two basic features:*
  - *Risk free or default free*?
  - Ready negotiability
- Types of bonds
  - Coupon Bonds
    - Fixed rate and floating rate bonds
  - Zero Coupon Bonds/Discount bonds
  - Index Linked Bonds
  - Hybrid Bonds/Bonds with embedded options
    - Bond with call option- callable
    - Bond with put option- puttable
  - STRIPS – Separate Trading of Registered Interest and Principal of Securities

The nomenclature of a typical dated fixed coupon Government security contains- coupon, name of the issuer, maturity year

- For example: *7.17% GS 2028*
  - Coupon : 7.17% paid on face value
  - Name of Issuer : Government of India
  - Date of Issue : January 8, 2018
  - Maturity : January 8, 2028
  - Coupon Payment Dates : Half-yearly (July 08 and January 08) every year
  - Minimum Amount of issue/ sale : Rs 10000
- Two bonds with the same coupon and maturing in the same year???
  - Example: 6.05% GS 2019 FEB

Coupon bonds

▶ *Fixed Rate Bonds*

  ▶ The coupon rate (interest rate) is fixed for the entire life of the bond

  ▶ For example- 8.24%GS2018 (issued on April 22, 2008 for a 10 years matured on April 22, 2018).

  ▶ Coupon on this security is paid half yearly at 4.12%

▶ *Floating Rate Bonds(FRB)*

  ▶ A variable coupon rate is re-set at preannounced intervals.

  ▶ First issued in India in September 1995.

  ▶ Reference for variable coupon rate:

    ▶ Average rate of the yields at the cut-off prices of the last three auctions of 182 day T- Bills.

  ▶ FRBs can also carry the coupon - that will have a *base rate plus a fixed spread* (decided in auction).

    ▶ For example, FRB 2031 (auctioned on May 4, 2018).

      ▶ Coupon was linked to a *Base rate*, *the Weighted Average Yield* (WAY) of last 3 auctions (from the rate fixing day) of 182 Day T-Bills plus *a fixed spread*.

Zero Coupon Bonds

▶ Bonds with no coupon payments.

▶ Issued at a discount and redeemed at face value.

▶ The GOI had issued such securities in 1996.

▶ Currently, Treasury bills (T-bills) are issued.

▶ Example:

   ▶ 91 day T-bill of Rs. 100, face value (FV), at a discount of say, Rs. 1.80.

      ▶ Issued at Rs 98.20 and would be redeemed at the FV of Rs. 100 at the maturity.

   ▶ The return to the investors is the difference:

      ▶ i.e. Rs 100 – Rs. 98.20 = 1.80

Index linked bonds(IIBs)

- Ordinary fixed-interest government securities are subject to inflation risk.
- IIBs offer protection against inflation
  - Capital Indexed Bonds (CIB) and Inflation Indexed Bonds
- Globally, first issued in 1981 in UK; In India, first in 1997 (CIBs) and later in 2013 (Inflation Indexed Bonds-IIBs).
- Example:
  - Suppose, 3% of IIB with a FV Rs 1000
  - Holder gets an annual interest of Rs. 30 x value of the CPI
  - Similarly for the principal at the maturity
  - Suppose:
    - CPI at the time of issue of the bond = 100
    - CPI at the time of interest payment = 112
    - The Index Factor/Index Ratio $_{Set\ Date} = \dfrac{Ref\ CPI\ _{Set\ Date}}{Ref\ CPI\ _{Issue\ Date}}$
  - = 112/100 = 1.12
  - Interest payment = Rs 30 x 1.12 = Rs. 33.6
  - If it is a 1 year maturity bond:
    - 1000 x 1.12 = Rs.1120
    - 1120 x 0.03 = Rs. 33.6
    - 33.6 + 1120 = Rs.1153.6

Example 1							
Year	**Period**	**Real Coupon**	**Inflation Index**	**Index Ratio**	**Inflation adjusted principal**	**Coupon Payments**	**Principal Repayment**
I	II	III	IV	$V_{ti}=(IV_{ti}/IV_{t0})$	$VI=(FV*V)$	$VII=(VI*III)$	VIII
0	28-May-13	1.50%	100	1.00	100.0		
1	28-May-14	1.50%	106	1.06	106.0	1.59	
2	28-May-15	1.50%	111.8	1.12	111.8	1.68	
3	28-May-16	1.50%	117.4	1.17	117.4	1.76	
4	28-May-17	1.50%	123.3	1.23	123.3	1.85	
5	28-May-18	1.50%	128.2	1.28	128.2	1.92	
6	28-May-19	1.50%	135	1.35	135.0	2.03	
7	28-May-20	1.50%	138.5	1.39	138.5	2.08	
8	28-May-21	1.50%	142.8	1.43	142.8	2.14	
9	28-May-22	1.50%	150.3	1.50	150.3	2.25	
10	28-May-23	1.50%	160.2	1.60	160.2	2.40	160.2

Note: FV = Face Value, which is Rs. 100 in the above case

Example 2

Year	Period	Real Coupon	Inflation Index	Index Ratio	Inflation adjusted principal	Coupon Payments	Principal Repayment
I	II	III	IV	$V_{ti}=(IV_{ti}/IV_{t0})$	$VI=(FV*V)$	$VII=(VI*III)$	VIII
0	28-May-13	1.50%	100.0	1.00	100	1.50	
1	28-May-14	1.50%	106.0	1.06	106	1.59	
2	28-May-15	1.50%	111.0	1.11	111	1.67	
3	28-May-16	1.50%	104.0	1.04	104	1.56	
4	28-May-17	1.50%	98.0	0.98	98	1.47	
5	28-May-18	1.50%	99.0	0.99	99	1.49	
6	28-May-19	1.50%	105.5	1.06	105.5	1.58	
7	28-May-20	1.50%	110.2	1.10	110.2	1.65	
8	28-May-21	1.50%	106.5	1.07	106.5	1.60	
9	28-May-22	1.50%	104.2	1.04	104.2	1.56	*Capital protection*
10	28-May-23	1.50%	99.2	0.99	99.2	1.49	100

Note: FV = Face Value, which is Rs. 100 in the above case

Composition of Domestic Bonds issued by Central Government across Countries
(as % of total outstanding)

Country	Floating Rate	Fixed Rate	Inflation Indexed	Exchange Rate linked
Argentina	14.8	0.8	49.5	34.8
Brazil	21.0	39.6	38.8	0.6
Chile	0.0	20.2	79.8	0.0
India	1.9	98.1	0.0	0.0
Indonesia	17.6	82.4	0.0	0.0
Canada	0.0	92.3	7.7	0.0
South Africa	0.0	74.6	25.4	0.0
Mexico	26.2	52.1	21.7	0.0
Germany	0.0	89.1	10.0	1.0
United Kingdom	0.0	76.8	23.2	0.0
United States	0.0	91.0	9.0	0.0

Source: Bank for International Settlements, 2012.

Bonds with Call/ Put Options

- Bonds can also be issued with features of optionality.

- The issuer can have the option to buy-back (call option) or the investor can have the option to sell the bond (put option) to the issuer during the currency of the bond.

- Bonds may have put only or call only or both options.

- In India, the first G-Sec with both the options viz. 6.72% GS 2012 was issued on July 18, 2002.

  - Can be exercised after 5 years from the date of issuance.

  - On any of the half yearly coupon dates at par value.

STRIPS – Separate Trading of Registered Interest and Principal of Securities

- Created by way of separating the cash flows associated with a regular G-Sec.

- Represent future cash flows of an underlying coupon bearing bond.
  - Zero Coupon Bonds (ZCB).

- However, they are created out of existing securities only and unlike other securities, are not issued through auctions.

- For example, Rs. 100 of the 8.60% GS 2028 is stripped.
  - Each cash flow of coupon (Rs. 4.30) will become a coupon STRIP
  - The principal payment will become a principal STRIP.
  - These cash flows are traded separately as independent securities in the secondary market.

- STRIPS ensure the availability of sovereign ZCB and facilitate the development of Zero Coupon Yield Curve.

- Have zero reinvestment risk

Types of auctions for G-secs

▶ Issue of G-secs are done through auctions, a market-based price discovery process.

▶ An auction may either be yield based or price based.

▶ *A yield-based auction* – New securities

  ▶ Bids in Yield form -ascending order

  ▶ The cut-off yield is arrived at the yield corresponding to the notified amount of the auction. The cut-off yield is the coupon rate for the security.

▶ *A price based auction- R*eissuing securities

  ▶ Bids in terms of price per ₹100 of FV of the security.

  ▶ Arranged in descending order of price offered.

  ▶ The cut-off price is arrived at the price corresponding to the notified amount of the auction.

▶ Depending upon the method of allocation to successful bidders, auction may be conducted on **Uniform Price** basis or **Multiple Price** basis.

  ▶ Uniform Price auction- the auction cut-off price/yield.

  ▶ Multiple Price auction- the respective price/yield quoted.

▶ Competitive Bidding - SGL account – can bid at a specific price/yield – at cut-off yield/price-multiple bids possible

▶ Non-Competitive Bidding (up to 5% of the issue)- no price/yield quoted - single bid- allotment at the weighted average rate of yield/price

A Case Study On Treasury Bill Auction Procedure

▶ On 28th January, 2022, RBI issued a tender notification for 91 day T-bill for Rs. 500 crore.

▶ There are 4 competitors/bidders, namely A, B, C, and D, who responded to the notification and submitted sealed tenders to the RBI.

▶ The general manager public debt office, Mumbai, opened the tenders to determine the cut off point.

▶ The overall amount quoted through the tender is Rs. 1,900 crore.

Details of bids received in the decreasing order of bid price

Bid no.	Name of the bidder	Price of bid (Rs.)	Amount of bid (Rs Cr)	Cumulative amount (Rs Cr)
1	B	98.95	50	50
2	A	98.90	40	90
3	A	98.80	60	150
4	C	98.80	80	230
5	B	98.75	50	280
6	C	98.65	120	400
7	A	98.50	100	500
6	B	98.50	100	600
8	C	98.50	200	800
10	A	98.45	200	1000
11	D	98.45	70	1070
12	B	98.40	120	1190
13	C	98.35	280	1470
14	D	98.35	120	1590
15	D	98.30	150	1740
16	D	98.25	160	1900

➤The General Manager decided a cut off price of Rs 98.50.

Your are required to

➤Allocate T-Bills to the bidders keeping in view the cut of price of Rs 98.50

➤Calculate the yield for the issue under uniform price auction method

➤ Calculate average yield for the A, B, and C under multiple price auction method

➤Calculate weighted average yield, which is cost to the issuer, for the issue

➤ Yield can be calculated as: $= \left[\dfrac{Face\ value - Price}{Price}\right] \times \left[\dfrac{365\ days}{Days\ to\ Maturity}\right] \times 100$

Allocating the T-Bills

➢ Bids above the cut-off price (up to the requirement of RBI) are accepted at the respective bid prices.
➢ All the bids below the cut-off price will be rejected.
➢ Remaining Rs. 100 Crore will be allotted to at the cut-off price on pro-rata basis.

Name of the Bidder	Price (quoted) (1)	Amount (Rs. Crore) (2)	Allotment (Rs. Crore) (3)	Remaining Rs. 100 Crore is on pro-rata basis at cut-off price	
				Successful bid amount of each bidder/total successful bid amount(4)	= (4)*Rs.100 Crore
A	98.90	40	100	100/400=0.25	0.25* 100= 25
A	98.80	60			
B	98.95	50	100	100/400=0.25	0.25* 100= 25
B	98.75	50			
C	98.80	80	200	200/400=0.50	0.50* 100= 50
C	98.65	120			
Total successful bid amount			400		100
A	98.50	100	25		
B	98.50	100	25		
C	98.50	200	50		500
Remaining Rs 100 Cr on pro-rata basis			100		

Yield for the issue under uniform price auction method

- $Yield = \left[\dfrac{Face\ value - Price}{Price}\right]$ X $\left[\dfrac{365\ days}{Days\ to\ Maturity}\right]$ x100

- $= \left[\dfrac{100 - 98.50}{98.50}\right]$ X $\left[\dfrac{365\ days}{91\ Days}\right]$ x 100 \quad (or) \quad $\left[\dfrac{100}{98.50} - 1\right]$ X $\left[\dfrac{365\ days}{91\ Days}\right]$ x100

- 0.0152 x 4.011 = 0.0611 or 6.1081%

- Yield = 6.11%

Average yield for the A, B, and C under multiple price auction method

Name of the Bidder	Price	Amount	Proportion	Weighted Price	Yield%
(1)	(2)	(3)	(4)	(5)	(6)
	$\overline{}$ ×100		(4) = (3)/TOTAL	(5) = (2)*(4)	$=\left[\frac{FV-P}{P}\right] \times \left[\frac{365\ days}{Days\ to\ Maturity}\right] \times 100$
A	98.90	40	0.32	31.65	
A	98.80	60	0.48	47.42	
A	98.50	25	0.20	19.70	
TOTAL		125	1.00	98.77	= 4.995
B	98.95	50	0.40	39.58	
B	98.75	50	0.40	39.50	
B	98.50	25	0.20	19.70	
TOTAL		125	1.00	98.75	= 5.077
C	98.80	80	0.32	31.61	
C	98.65	120	0.48	47.35	
C	98.50	50	0.20	19.70	
TOTAL		250	1.00	98.66	= 5.448

Weighted average yield for the issue

Name of the Bidder	Price	Amount	Proportion	Weighted Price	Yield%	Weighted Average Yield (%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
			(4) = (3)/Total	(5) = (2)*(4)		[(Successful bid amount of each bidder /Total bid amount) * Yield of each bidder]
A	98.77	125	0.25	24.69	4.995	(125/500) * 4.995 =1.249
B	98.75	125	0.25	24.70	5.077	(125/500) * 5.077 =1.269
C	98.66	250	0.50	49.33	5.448	(250/500) * 5.448 = 2.724
Total		500	1.00	98.72		5.242

➢ 5.242 is the cost to RBI. This is the weighted average yield of all the bidders.

Corporate financial policy

➢ As smaller unincorporated enterprises and private firms grow, sooner or later approach the securities markets.

➢ The mix of securities supplied to the markets depends on the financial policy of firms.

➢ It involves three key decisions.

   ➢ The optimal mix of debt versus equity

   ➢ The desirable maturity structure of debt

   ➢ The preferred source of debt funds (e.g., corporate bonds versus banks or finance companies)

➢ The ultimate objective is to minimize the total cost of funds

- ▶ Choice of optimal capital structure -Various models
  - ▶ Traditional corporate finance or trade-off models
    - ▶ By trading off various tax and incentive benefits of debt financing against financial distress costs
    - ▶ A firm's history may play a more important role in determining its capital
      - ▶ Highly profitable firms often use their earnings to pay down debt and become levered than their less profitable counterparts (Titman and Wessels, 1988)
      - ▶ Firms tend to issue equity following an increase in stock prices (Masulis and Korwar, 1986)
  - ▶ Donaldson's (1961) "pecking order" description that there is negative correlation between profits and leverage
  - ▶ Dynamic models of capital structure (Fischer, Heinkel, and Zechner, 1989) introduces transaction costs that generate short-run pecking order behavior.
    - ▶ Firms will periodically readjust their capital structures toward a *target ratio* that reflects the costs and benefits of debt financing found in the static trade-off models.
    - ▶ In particular, firms repurchase equity after their share prices increase to adjust toward an optimal capital structure. But this is inconsistent with the observation that firms tend to issue equity following stock price increase.

Debt is preferable!

- Debt instruments are attractive and cheaper- For two reasons
  - The interest paid is deductible from the corporate income tax.
  - Lower expected return.
  - Additionally,
    - Bondholders do not vote and are therefore harmless as far as management is concerned.
- Why, then, do firms not finance themselves with 99.9% debt instead of the average of only 38%???
  - Because, more the debt ratio means more risk, as non-payment of debt may lead to liquidation.
- Prospective investors and lenders, as the ratio of debt to equity (DE Ratio) rises, expects higher rate of return and certain lenders may be even unwilling to buy at any price.
  - A more volatile economy will require firms to reduce their debt ratios, supplying more equity to the securities markets.
- More expensive funds reduce the value of the firm. But, up to a point, inherently lower cost of debt outweigh this effect (See Fig).

The general relationship between the value of a firm and its debt-equity ratio

Debt policy and a firm's market value
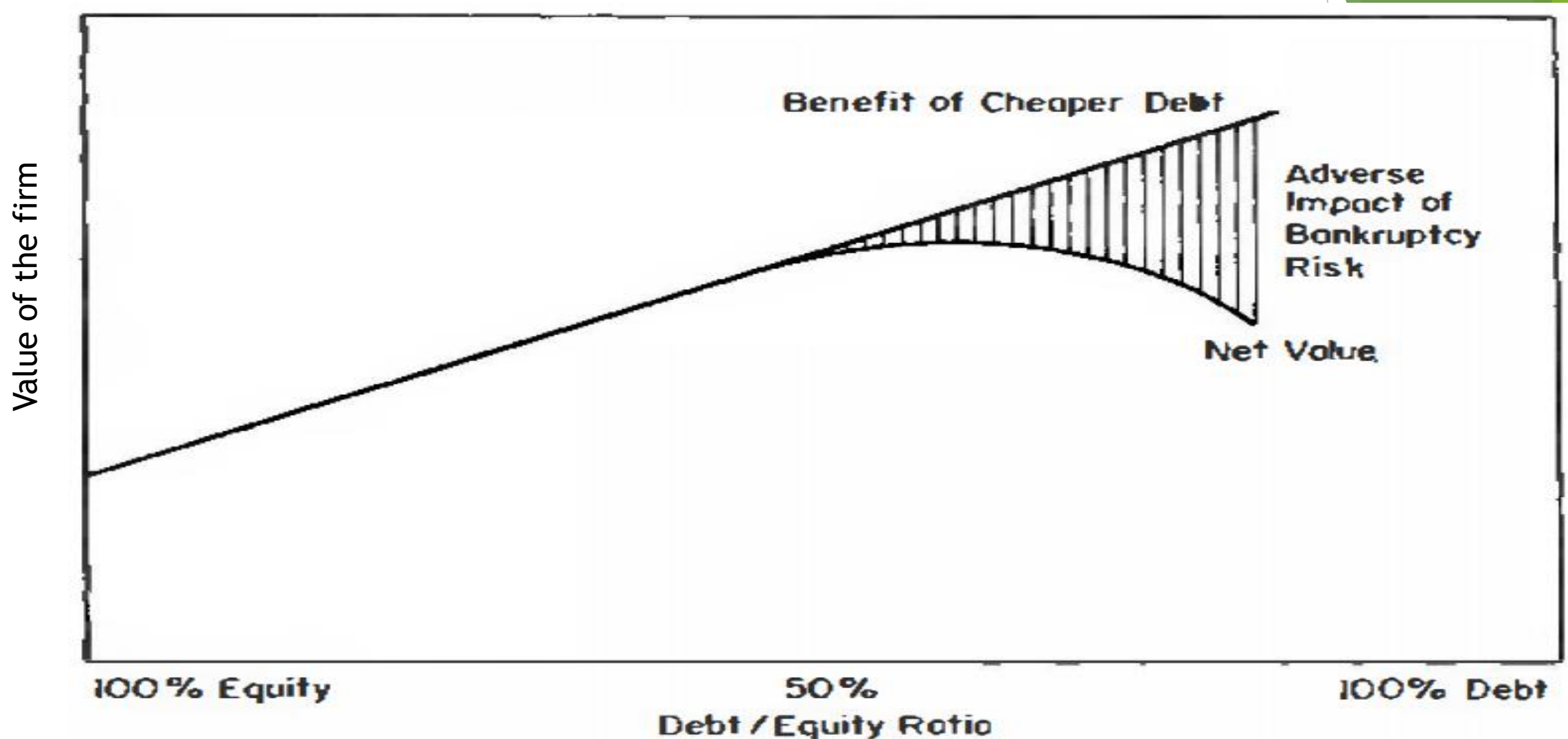
Supplying more debt increases a firm's value so long as the chance of bankruptcy is relatively low

India Inc's debt-equity ratio falling! So, who's leading deleverage? drive

Fig. 1: BSE500 (ex-banks) debt-equity ratio (%)
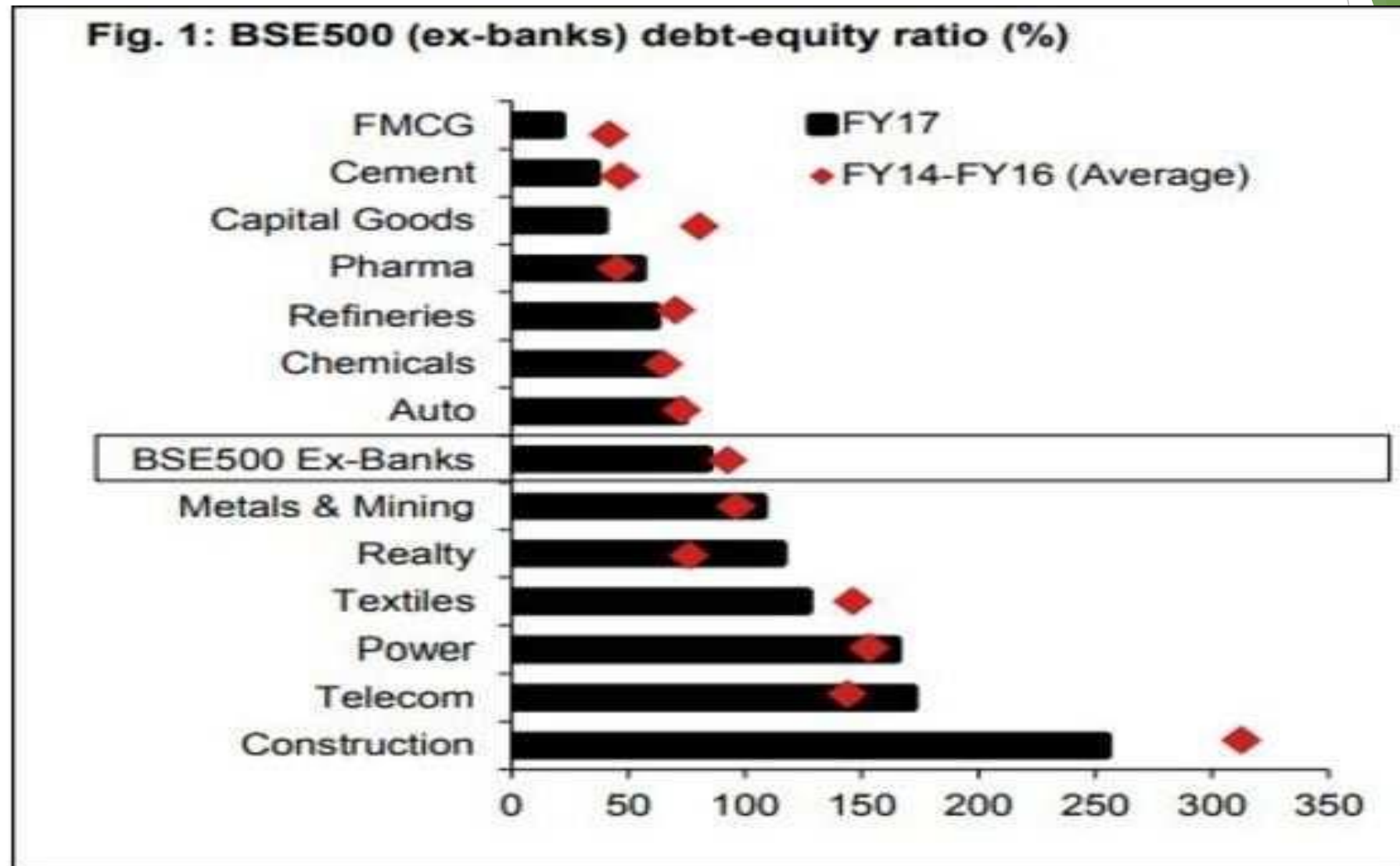
Corporates are deleveraging!

➢ Another form of the leverage is debt to Asset Ratio

➢ From the year 2015-16 both the leverage measures have declined.

➢ The debt-equity ratio and debt asset ratio of the Indian corporate sector are around 48 per cent and 19 per cent respectively

Measures of Leverage
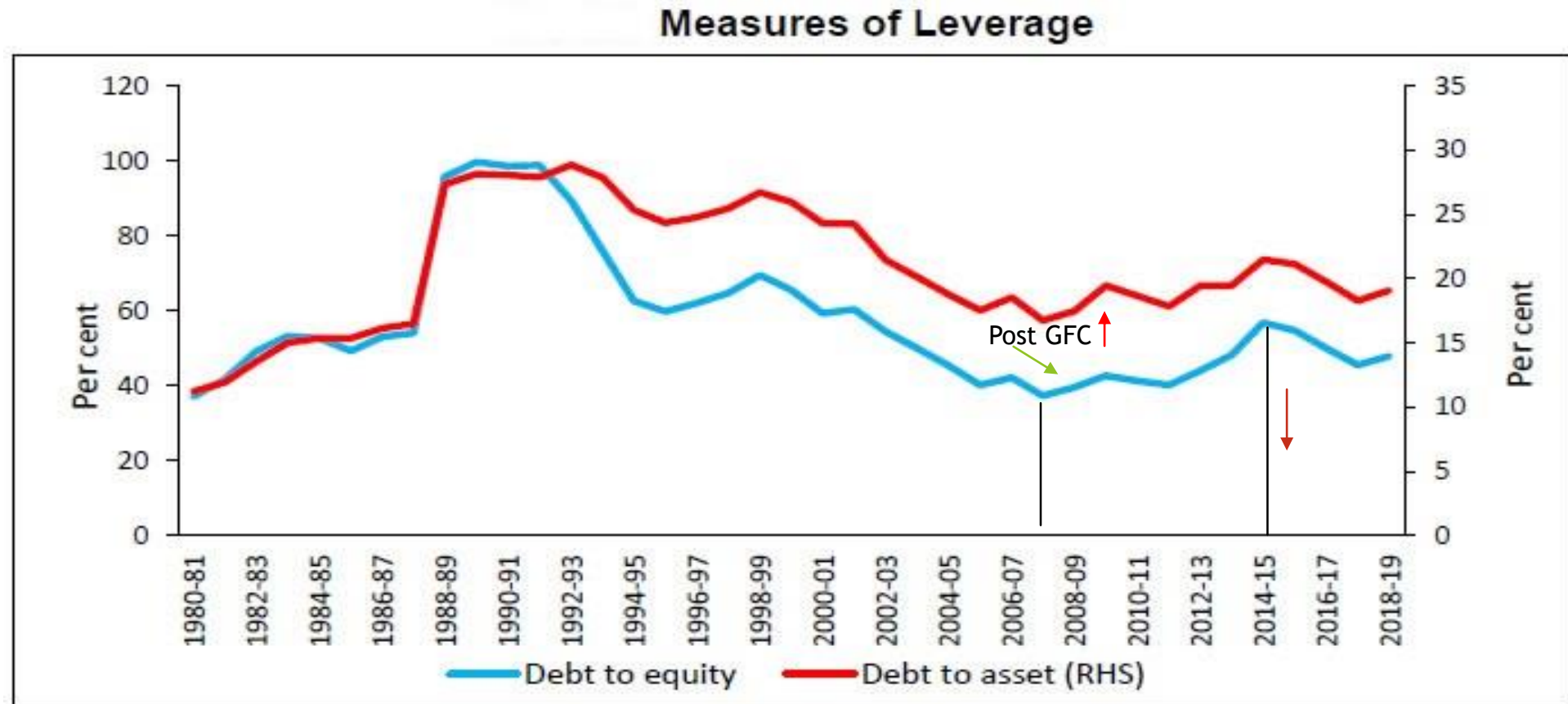
Source: DBIE, RBI.

Rights attached to each type of security under liquidation

▶ In practice, bankruptcies will occur.

▶ A typical ranking of corporate liabilities under bankruptcy:

<div align="center">

FIRST

</div>

Liquidator's fees '

Accrued wages and employee benefits

Unpaid Taxes

Mortgages and other debts secured on particular assets

First ranking debentures

Lower ranking debentures

Unsecured notes

Trade creditors

Subordinated debt

Preferred shares

Common shares

<div align="center">

LAST

</div>

▶ The lower the ranking higher the risk.

It involves three key decisions (Cont.)

▶ Returning to the firm's decision making process, once the optimal level of debt financing is determined, the company must decide what maturity structure is best suited to its purposes.

▶ Desirable level is influenced by two opposing forces.

  ▶ Short-term securities are cheaper source than those with longer maturities.

  ▶ The use of short-term securities leads to frequent roll overs of debt and exposed to interest rate risk.

▶ Need a balance between the two

▶ **Corporate Equities- Characteristics**

1. Common stock-the fundamental ownership claim in a public or private corporation

  A. Discretionary dividend payments

   ▶ Unlimited dividend but not fixed

   ▶ Firm does not default if it misses a dividend payment

   ▶ Dividends are taxed twice

  The return to a stockholder over a period t -1 to t can be written as:

  $$R_t = \frac{P_t - P_{t-1}}{P_{t-1}} + \frac{D_t}{P_{t-1}}$$

  Where

   P_t = Stock price at time t

   D_t = Dividends paid over time t -1 to t

  $(P_t - P_t-1)/P_t-1$ = Capital gain over time t 1 to t

   D_t / P_t-1 = Return from dividends over time t- 1 to t

Payment of dividends vs reinvestment of earnings

- The reinvestment of earnings (rather than payment of dividends) affects both return components: capital gains and dividends.

- A corporation has after- (corporate) tax earnings that would allow a Rs 2 dividend per share to be paid to its stockholders.

- If these dividends are paid, the firm will be unable to invest in new projects, and its stock price, currently Rs 50 per share, probably would not change.

- The return to the firm's stockholders in this case is: $R_t = (50-50)/50 + (2/50) = 4\%$

- Suppose the stock is bought at the beginning of the year (at Rs 50) and sold it at the end of the year (at Rs 50).

- Assume the stockholder's ordinary income tax rate is 30 % and the capital gains tax rate is 20 percent.

- The return is all in the form of ordinary income (dividends).

  - $(50-50)/50 + (2/50) = 4\%$

- The after-tax rate of return = 4% (1 - 0.30) = 2.8%.

- Alternatively, the firm can use the earnings to invest in new projects that will increase the value of the firm and the stock price to Rs 52 per share.

- The return is all in the form of capital gains

  - $(52-50)/50 + (0/50) = 4\%$

- Thus, the after-tax rate of return = 4% (1- 0.2) = 3.2%.

B. Residual Claim:

- ▶ Common stockholders have the lowest priority claim on a corporation's assets in the event of bankruptcy.

- ▶ All senior claims are paid before.

- ▶ For example, the bankruptcy of Washington Mutual Bank in 2008 left its shareholders with nothing.

- ▶ Stocks riskier than bonds!

C. Voting Rights:

- ▶ It is a fundamental privilege assigned to common stock.

- ▶ Stockholders elect board of directors and exercise their right through them.

  - ▶ Episode of Charmian and CEO of Walt Diseny Co. in 2004.

D. Limited Liability

➢ Losses are limited to the amount of their original investment in the firm in contrast to sole proprietorship or partnerships

Fig. A: Corporate shareholders' possible gain and losses per share

Fig. B: Sole proprietor/partnership interest gains and losses
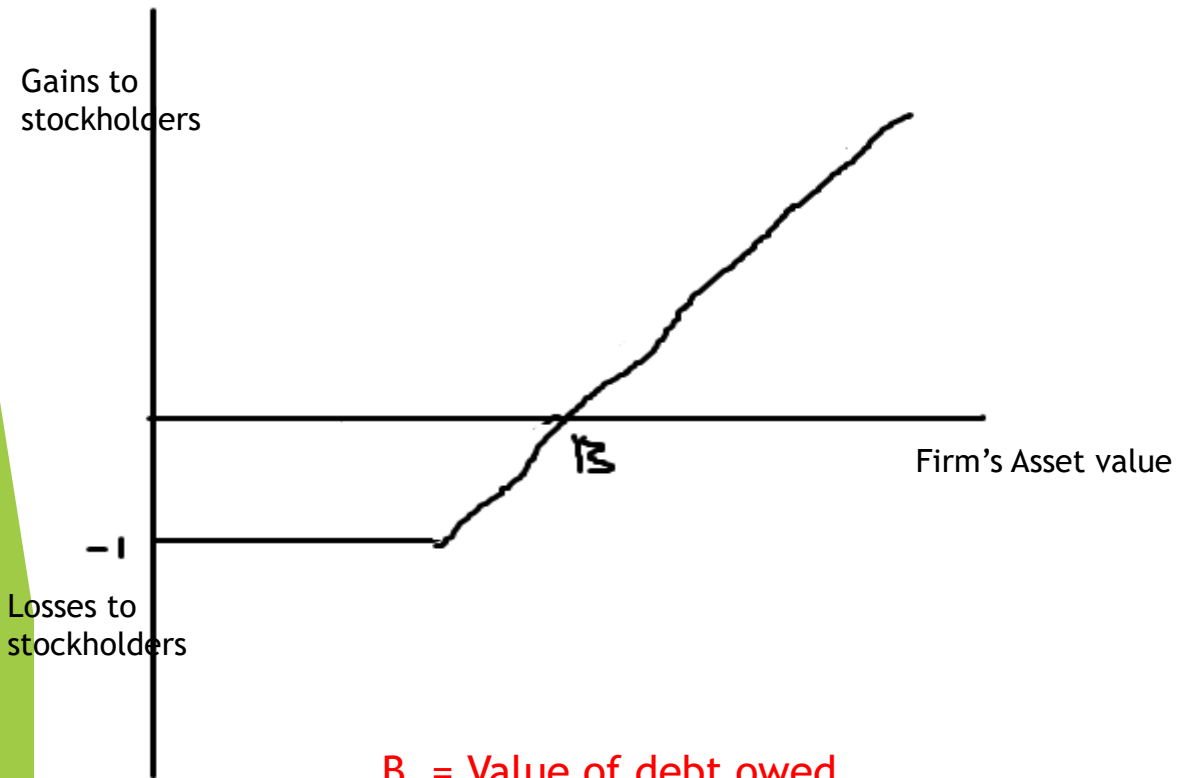
B = Value of debt owed
I = Value of original Equity investment in a firm
W = Investors total private wealth holdings
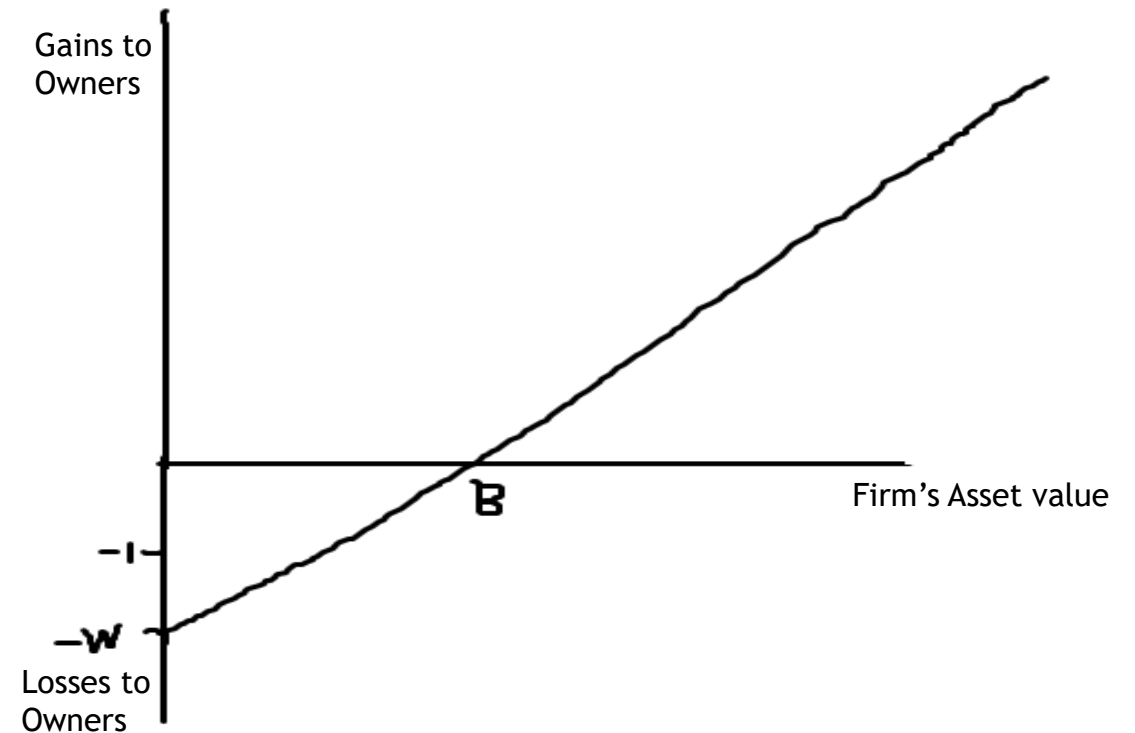
Preferred Stock

- A hybrid security

- Similar to common stock with an ownership interest, but like a bond it pays a fixed periodic payment.

- It is senior to common stock but junior to bonds.

- Preferred stockholders cannot force the firm into bankruptcy

- They are four types:

  - *Nonparticipating* - fixed dividend regardless of firm's profits.

    - The arrangement under Capital Purchase Program (CPP) of the Troubled Asset Relief Program (TARP) of U.S

  - *Participating* - May be greater than the promised. Exam: Riscorp,Inc.

  - *Cumulative* - Missed go into arrears and paid before common stock dividends.

  - *Noncumulative* – Missed do not go into arrears and are never paid. Exam. G&L Reality, Inc.

- Typically, preferred stock is nonparticipating and cumulative.

- Drawbacks:

  - *Investor's point of view*: If dividend is missed, new investors may not be interested in the firm.

  - *Firm's point of view*: Dividends paid are not a tax deductible expense.

The Supply of Corporate Securities - Equities

➢ A firm with its products may alter the volume of securities it is supplying to the market at any time.

➢ For equities, this can be done in 4 ways:

   ➢ New Shares

   ➢ Rights Issues

   ➢ Stock Splits (and the related methods of bonus issues or stock dividends)

   ➢ Share Repurchase

Going Public!!

- **Reasons for Going Public**
  - Raising funds to finance capital expenditure programs like expansion, diversification and modernization
  - Financing of increased working capital requirements
  - Financing acquisitions like a manufacturing unit, brand acquisitions and tender offers for shares of another firm
  - Debt refinancing
  - Exit route for existing investors
- **Advantages of Going Public**
  - Facilitates future funding by means of subsequent public offerings
  - Enables valuation of the company
  - Provides liquidity to existing shares
  - Increases the visibility and reputation of the company
  - Commands better pricing than placement with few investors
  - Enables the company to offer its shares as purchase consideration or as an exchange for the shares of another company.
- **Disadvantages of Going Public**
  - Dilution of ownership stake makes the company potentially vulnerable for future takeovers
  - Involves substantial expenses ranging between 4% to 15% of the size of the issue
  - Need to make continuous disclosures
  - Increased regulatory monitoring
  - Cost of maintaining investor relations
  - Takes substantial amount of management time and efforts

New Shares

- *Initial Public Offer (IPO)*

- *Objective:* to expand existing activities or setting up of new projects or any other or just to get its existing equity shares listed by diluting the stake of existing equity shareholders through _offer for sale_.

- *Eligibility Criteria:*
  - Paid up capital shall not be less than Rs 10 Cr
  - Capitalisation shall not be less than Rs 25 Cr
  - At least three years track record

- *Process:*
  - Draft prospectus (Red herring prospectus in case of book built public issue)
  - Security deposit with exchange (1% of the amount of securities offered for subscription)

Particulars	Amount (Rs)
Initial Listing Fees	50,000
Annual Listing Fees (on equity share, bond and/ or debenture capital)	
Upto 100 crore	2,90,000
Above 100 Crore and upto 200 Crore	3,80,000
Above 200 Crore and upto 300 Crore	4,90,000
Above 300 Crore and upto 400 Crore	5,95,000
Above 400 Crore and upto 500 Crore	7,30,000

- *Listing Fees*- based on Paid up Capital (see the table*):*

- *Offer Document: I*nformation about the company, promoters, the project, financial details, issue price, objective of fund raising, terms of use etc.
  - called "Prospectus" in case of a public issue and "Letter of Offer" in case of a rights issue.

- *Merchant Banker:* Prepares offer document and responsible for legal compliance.

- *Opening of the issue:*
  - Wide advertisements
  - Open for at least 3days but not more than 10 working days.
  - *Registrar to the Issue:* Handles the entire back office operation including processing of application forms, dispatch of refunds, allotment of securities

- *Underwriting*

► Case example: ABC company

  ► Offers 10 crore shares at Rs 600 per share to the public. The minimum amount is required to be in the range of Rs. 5,000 – 7,000. As such, the minimum application size works out to 9 shares (Rs. 600 X 9 = Rs 5,400). Thus, application can be made for a minimum of 9 shares or in multiples thereof.

  ► Subscription details are:

Item	Number of shares offered	Subscription received for (number of shares)
Total	10 crore	40 crore (4times)
out of which, offered to retail investors	3.5 crore	28.87 (8.25 times)

  ► Assume there are three retail individual investors applied for:
    ► A for 81 shares; B for 72 shares and C for 45 shares.
    ► Allotment to each investor is in proportion to the number of times of subscription.
    ► i.e. 1/8.25th of the number of shares applied for.

Name of retail investor	Number of shares applied for (A)	Number of shares eligible to be allotted (A / 8.25)	Shares allotted after rounding off
A	81	81/8.25 = 9.82	10
B	72	72/8.25 = 8.73	9 (i.e. minimum application size)
C	45	45/8.25 = 5.45	The successful applicants out of the total applicants shall be determined by drawing lots. Allotment would be 9 shares

Different Types of Issues

A. *Public Issue* : IPO and FPO

B. *Offer for Sale:* When institutional investors sell their shares to the public and the company's shares are listed on stock exchange. There are many differences between OFS and FPO.

C. *Issue of Indian Depository Receipts (IDR):*

    a) A foreign company can raise money from Indian investors providing ownership and dividend.

D. *Other issues:*

    a) Rights Issue

    b) Bonus Issue

    c) Private Placement: When a company issues shares or convertible securities to a select group of persons not exceeding 49. This is neither a rights issue nor a public issue.

        a) Three types:

            a. *Preferential allotment-* a listed issuer issues shares or convertible securities to a select group of persons.

            b. *Qualified institutions placement (QIP):* shares or non-convertible debt instruments along with warrants and convertible securities other than warrants to Qualified Institutions Buyers only.

            c. *Institutional Placement Programme (IPP):* makes a further public offer of equity or offer for sale of shares by promoter/promoter group of listed issuer only to qualified institutional buyers.

Pricing of (public) issues

- The issuer in consultation with the merchant banker decides the price based financials of the company and strengths of peers in the industry.

- Issue can be Fixed Price issue or Book Built issue.

  - Fixed Price Issue: Issuer at the outset decides the issue price and mentions it in the Offer Document

  - Book built Issue: The price of an issue is discovered on the basis of demand received from the prospective investors at various price levels.

Book building

- The issuer and the merchant banker decides the price based financials of the company and strengths of peers in the industry.

- Issue can be Fixed Price issue or Book Built issue.

  - Fixed Price Issue: Issuer at the outset decides the issue price and mentions it in the Offer Document

  - Book built Issue: The price of an issue is discovered on the basis of demand received from the prospective investors at various price levels.

    - Price band to be mentioned; but the spread shall not be more than 20%.

    - The offer document (Red Herring Prospectus) contains only the price band

    - The 'cut-off' price is arrived at based on the demand of securities.

    - Only the retail investors (applying for worth up to Rs 2 lakhs) have the option of bidding at 'cut-off'.

    - Example:

      - A company wants to issue 1,000 shares.

      - Price band is Rs100 to Rs120.

      - The cut off price would be arrived at as:

No. of shares bid	Cumulative number of shares bid	Bid Price	Shares allotted
0	0	120	0
300	300	119	300
450	750	117	450
550	**1300**	**114**	250
200	1500	112	0
0	1500	110	0
Cut of price	Rs 114		Total 1000

- All investors who applied for shares at or above the cut off price will be allotted shares at the cut off price (issue price), proportionately.

Rights Issue

▶ A company raises funds from its existing shareholders by issuing them new shares.

  ▶ New shares in proportion to the number of shares already held.

    ▶ 1:5 ratio - one (new) share for every 5 shares held.

  ▶ Issue can be open for 30-60 days; *Share India Securities* has recently issued.

▶ Implications of rights issue purchased on ownership, market value and investment.

  ▶ Example:

    ▶ 1,000 shares of common stock with 1 million total shares outstanding in ABC firm that plans to sell additional 5 lakhs shares through a rights offering, i.e. 0.5 right for each share of stock owned. One right can then be exchanged for one new share.

  ▶ Impact of Ownership:

    ▶ Your current ownership interest = 0.1 % (1000/1 million).

    ▶ Now receive 500 rights (1000 x 0.5); allow to buy 500 additional shares.

    ▶ If rights exercised, your ownership = 0.1 % i.e. [(1000+500)/1 million + 5 lakh].

    ▶ *Thus, no change in the ownership.*

Rights Issue (Cont.)

- ▶ Impact on Market value
  - ▶ Total market value = Rs 40 million (@ Rs 40 stock x 1 million) before the rights offering
  - ▶ The new (500,000) shares are offered @ 10 % discount (or for Rs 36 per share).
    - ▶ = *Rs 18 million* (Rs 36 x 500,000) additional amount received; total number of shares will become *1.5 million*.
  - ▶ What is the market value of the firm???
    - ▶ = Rs 58 million (Rs 40 million + Rs 18 million). i.e. Rs 38.67 per share (Rs 58 million /1.5 million)

- ▶ Impact on your investments:
  - ▶ 1,000 shares = Rs 40,000 (Rs 40 x 1,000) before rights
  - ▶ 500 additional shares @ 10 % discount (on Rs. 40) = Rs 18,000 (Rs 36 x 500).
  - ▶ Total investment after the rights offering = Rs 58,000, or Rs 38.67 per share (Rs 58,000 / 1,500).

- ▶ What if you decide not to exercise your preemptive right! !
  - ▶ Each right allows a stockholder to buy a new share for Rs 36 per share when the shares are worth Rs 38.67.
  - ▶ So one right = 2.67 (Rs 38.67 – Rs. 36).
  - ▶ If you sell your rights, you maintain your original 1,000 shares.
  - ▶ But the value of these shares after the rights offering = Rs 38,667 (1,000 x Rs 38.67).
  - ▶ Value of 500 your rights = Rs 1,333, i.e. (500 x Rs 2.67).
  - ▶ Total wealth of Rs 40,000 (Rs 38667 + Rs 1333) ......you have lost no wealth!!!!

Stock Splits (and the related methods of bonus issues or stock dividends)

- **Bonus issue or stock dividend**
  - The company issues new shares to existing shareholders with out collecting any amount. *Example. Jyoti Resins and Adhesives (a small cap chemical) bonus @ 2:1 ratio.*
  - Dividend can be partly in cash and partly in stock (60:40)
  - Stock dividend reduces the stock value of the company!
    - For instance, a company has announced 1:20, i.e. 1 for 20 stocks currently held.
      - Total value of outstanding shares = Rs. 100 Crore
      - Total no. of shares outstanding = 10 million or 1 crore shares
        - Thus, the stock price before the announcement = Rs 100 cr/1 crore stocks = Rs 100
      - At 1 for 20 stocks, new stocks will be = 1/20 = 0.05 / 5%
        - = 1 crore stocks x 5% = 5 lakh new stocks.
      - Stock value after the stock dividend =
        - = Rs 100 crore / 1.05 crore stocks = Rs 95.23 per stock

Bonus issue does not change net worth of the company!

▶ After a bonus issue, there is an increase in the equity capital of the company with a corresponding decrease in the reserves (accumulated profits) and thus the net worth remains constant.

▶ Example:

   ▶ ABC company has issued bonus shares at the ratio of 5:1, i.e. the investor will receive five new shares for each share held.

ABC Company	Before bonus issue	After bonus issue
Number of shares issued	100	600 (100+500)
Equity capital (face value of Rs 10)	Rs 1,000	Rs 6,000 (1,000 + 5,000)
Reserves (accumulated profits)	Rs 10,000	Rs 5,000 (10,000-5000)
Net worth (equity capital + reserves)	Rs 11,000	Rs 11,000

▶ NTPC (1:5) and WIPRO (1:3) have announced bonus issues.

Stock Split

- *2 stocks for 1 stock currently held.*
- Example: Microsoft went with IPO in 1983 and price of the stock was $21.
- 100 stocks in 1983 had become 28800 stocks in 25 years.
- Stock split reduces the stock price in the market.
- In 2003, Microsoft stock price was $48.36.
- Microsoft announced stock split at the ratio of 2 for 1.
- As result, stock price has come down by 50% i.e. 24.96.
- Motivation for stock split issue:
  - To increase the demand for the stocks by adjusting the price
    - Trading in odd lots increase transaction costs
    - Reverse split (1 for 2) ??? To Remove the unfavourable image of low value shares.
  - To increase the liquidity of the stocks
- Empirical findings:
  - Event study methodology – Fama and others (1969) failed to find any significant change in the market value of the firm following a split or stock dividend. Over the period immediately prior to a split stocks on average gave an abnormally high return; indicating that management tended to split the stock only after it had risen strongly.
  - On liquidity, Copeland (1979) found that after a split transactions costs tended to increase as a percentage of value, and that the turnover of the shares (the volume traded divided by the number of outstanding shares) often fell following a split

Shares repurchase

- The final method a corporation may use to alter the supply of its securities.

- Either by the corporation buying its own shares in the open market or by a tender offer for a desired quota.

- Three reasons:
  - Companies have accumulated cash and but lack promising investment opportunities within the firm.
  - The management may regard its shares as currently underpriced and signals this, hoping that the market will react by increasing the price.
  - May be a fear on the part of management that the corporation will be taken over by unfriendly investors.

- The repurchase results in a decline in the total assets held by the firm and a reduction in the supply of its shares to the market.

- Unless the company has surplus cash repurchase will lead to an increase in debt.

➤ Corporate bonds are long-term bonds.

➤ Issued against a trust *indenture* (a legal document)- with the rights and obligations and a number of covenants (rules and restrictions).

➤ Bonds may be issued in two ways:

> ➤ Private Placement:

> ➤ Public offering:

➤ The supply may be reduced either by repayment on maturity, by repurchase in the open market, or by redeeming them prior to that time under a call provision.

Convertible bonds

▶ Bonds exchanged for another security (e.g., common stock) <u>at the discretion</u> of the bond holder.

▶ These are hybrid securities.

▶ Exchange depends on conversion ratio, the number of shares per Rs. 1000 value of bonds redeemed.

▶ When will it happen with the investor???

▶ Example:

  ▶ ABC issued bonds with convertibility option, which gives bond holder right to buy shares from the company at a price of Rs 50 per share.

  ▶ Conversion ratio = 20 stocks per Rs 1000 value of bonds.

  ▶ If the share price > Rs. 50 per share, say it is trading at Rs. 60, the bod holder makes profit, in addition to the value of coupon payments.

▶ They are delayed issue of equity.

▶ It provides an opportunity (an option) and thus its return is lower (2 to 5%) than nonconvertible bond:

$$R_{cvb} = R_{ncvb} - OP_{cvb}$$

Where,

  R_{cvb} = Rate of return on a convertible bond

  R_{ncb} = Rate of return on a nonconvertible bond

  OP_{cvb} = Value of the conversion option to the bond holder

Analysis of a Convertible Bond

▶ In 2007, Titan had a convertible bond issue outstanding.

▶ Face value (FV) of bond = $1,000.

▶ Conversion rate = 285.71 stocks per $1000 FV bond (or $3.5 per stock = 1000/285.71).

▶ In June 2007, Titan's common stock was trading (on the NYSE) at $9.375 per share (......looks so very good!!!).

▶ Convertible bonds were trading at 267.875% of the FV of the bond, or $2,678.75.

▶ Is it profitable to convert the bonds into common stock???

Conversion value = Conversion rate x Current market price of common stock received on conversion

▶ Each bond (worth $2,678.75) could be exchanged for 285.71 shares of stock worth $ 9.375 per share.

▶ Thus, the conversion value of the bonds is:

　　　　= 285.71 x $9.375 = $2678.53

▶ The difference = $2,678.75 - $2678.53 = 0.22

▶ There is virtually no difference in value of the investment to the investor!!!!

▶ Advantages of Convertible bonds:

　▶ To issuer : a company can cut its cost of financing in the short run; existing control is not diluted in the short run.

　▶ To investor : Additional investment opportunity; can receive coupon payments till convertible date and capital gain.

Stock Warrants

- Bonds can also be issued with stock warrants attached.

- Bond holder gets an opportunity to detach the warrants to purchase common stock at a prespecified price up to a predetermined date.

- If exercised, don't have to return the underlying bond to the issuer (unlike a convertible bond). Holder keeps the bond and pays for additional stock at a price specified in the warrant.

- When will the bond holders will exercise their warrants?

    - If market prices > strike price quoted.

- Alternatively, the bond holder may sell the warrant rather than exercise it, while maintaining ownership of the underlying bond.

- Stock Options???

- Which firms attach warrants?

    - Risky firms for increasing the bonds' marketability.

    - To avoid high interest rates and very restrictive bond covenants and to attract investors.

- DLF issued 13.81 crore warrants to promoter group at Rs 217.25 each in 2017. It was exercised in 2019.

Callable Bonds

▶ Bond indenture may include a call provision, allows the issuer to force the bond holder to sell the bond back to the issuer at a given (call) price, usually set above the par value of the bond.

▶ Call Premium = call price - the face value.

▶ When are bonds usually called?

  ▶ when interest rates drop (and bond prices rise), the issuer can gain by calling in the old bonds (with higher coupon rates) and issuing new bonds (with lower coupon rates).

▶ A call provision is an unattractive feature to bond holders.

▶ Therefore, these bonds give higher yields (between 0.05 and 0.25 percent) than noncallable bonds.

$$R_{ncb} = R_{cb} - OP_{cb}$$

Where,

R_{ncb} = Rate of return on a non callable bond

R_{cb} = Rate of return on a callable bond

OP_{cb} = Value of the issuer's option to call the bond early

Callable Bond-Example

- Dupont:
  - $300 million callable debt in 2004. The FV of each bond was $1,000, with maturity date Jan 15, 2023.
  - Bond indenture specifies: The issue was callable between 2005 and 2013. C
  - If called in 2005 the bond holder will receive 103.47% of FV i.e. $1034.7 and so on.
  - Thus, call premium declines as the bond approaches maturity.
- Reasons to issue callable bonds
  - Higher interest rates
  - Sinking fund provisions
  - Restrictive covenants
  - To alter capital structure

Call schedule for DuPont Due 2023	
Year	Call Price
2005	103.47%
2006	103.09
2007	102.70
2008	102.32
2009	101.93
2010	101.54
2011	101.16
2012	100.77
2013	100.39

Financial Crisis 2007: Crash Course

▶ THE collapse of Lehman Brothers, a sprawling global bank, in September 2008 almost brought down the world's financial system.

Losses

Banks	Writedown($ billion)	Actions
Citigroup	55.1	Bailout by Fed Reserve($326 billion)
Merrill Lynch	51.8	Taken over by Bank of America
UBS	44.2	$5.3 billion Swiss government bailout
HSBC	27.4	
Wachovia	22.5	Wells Fargo
Bank of America	21.2	
Royal Bank of Scotland	14.9	
Morgan Stanley	14.4	bank holding companies
JP Morgan chase	14.3	
Lehman Brothers	8.2	Files for Bankruptcy
AIG	18.5	bailed out by Federal reserve

Effective Federal Fund Rate in the US
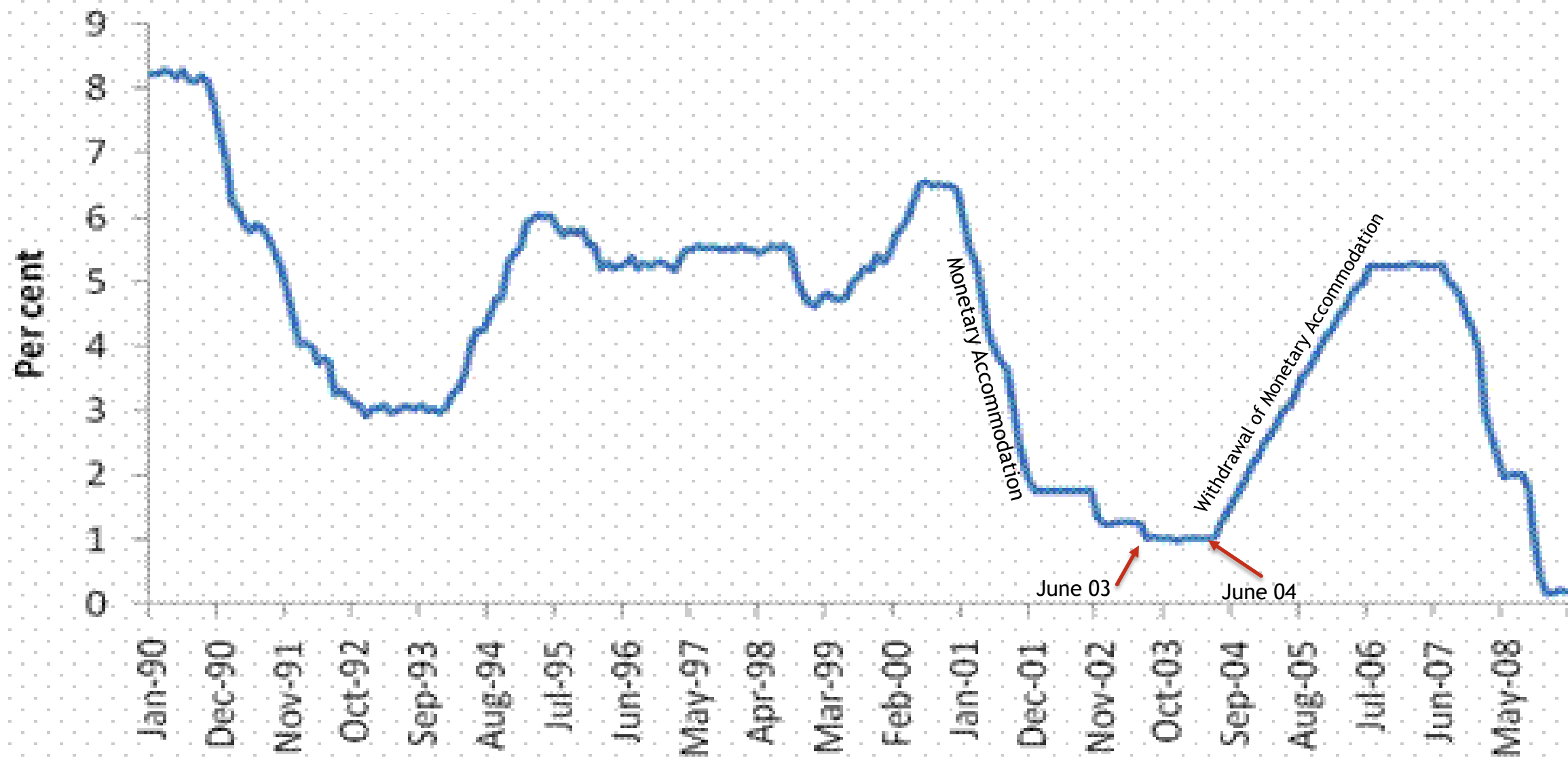
Source: FRED Database, Federal Reserve of St.Louis

Major Reasons

▶ **Global imbalances:** Substantial current account deficits in US and "savings glut" in Asia pushed down global interest rates.

▶ **Accommodative Monetary Policy**: loose credit or easy monetary policy.

▶ **'Great Moderation' period:** years of low inflation and stable growth—fostered complacency and risk-taking.

▶ **European banks in America**: borrowed greedily in American money markets before the crisis and used the funds to buy dodgy securities.

▶ **Irresponsible lending :** Lenders Misjudged the risk(subprime, pooling and interconnections in property markets)

▶ **Securitization:** conversion of (illiquid) loans into (liquid and marketable) debt instruments.

▶ **Rating Agencies:** They were paid by to get good credit ratings.

▶ **Financial innovation:** Created new financial instruments such as credit derivatives.

What went wrong?

▶ Subprime loans to NINJNA(No Income, No Job, No Asset)

▶ The Financial institutions (FI) in their eagerness to sanction as many loans as possible, inflated the actual income of the borrowers to make them eligible for the loan.

▶ The loan sanctioned was disproportionate to the means of the borrower, and the value of the property.

▶ Higher loan enabled the FI to issue more mortgage backed securities in the market

▶ The amount payable under the securitized debt was higher than the

   ▶ Repayment capacity of the sub prime borrower and

   ▶ Intrinsic value of the mortgaged property.

▶ With increased defaults, the market value of the mortgage securities started declining

Mortgage Backed Securities- CDOs

The pooled mortgages were used to back securities known as collateralised debt obligations (CDOs), which were sliced into tranches by degree of exposure to default.
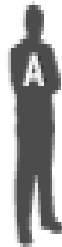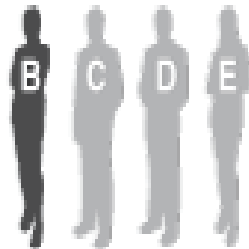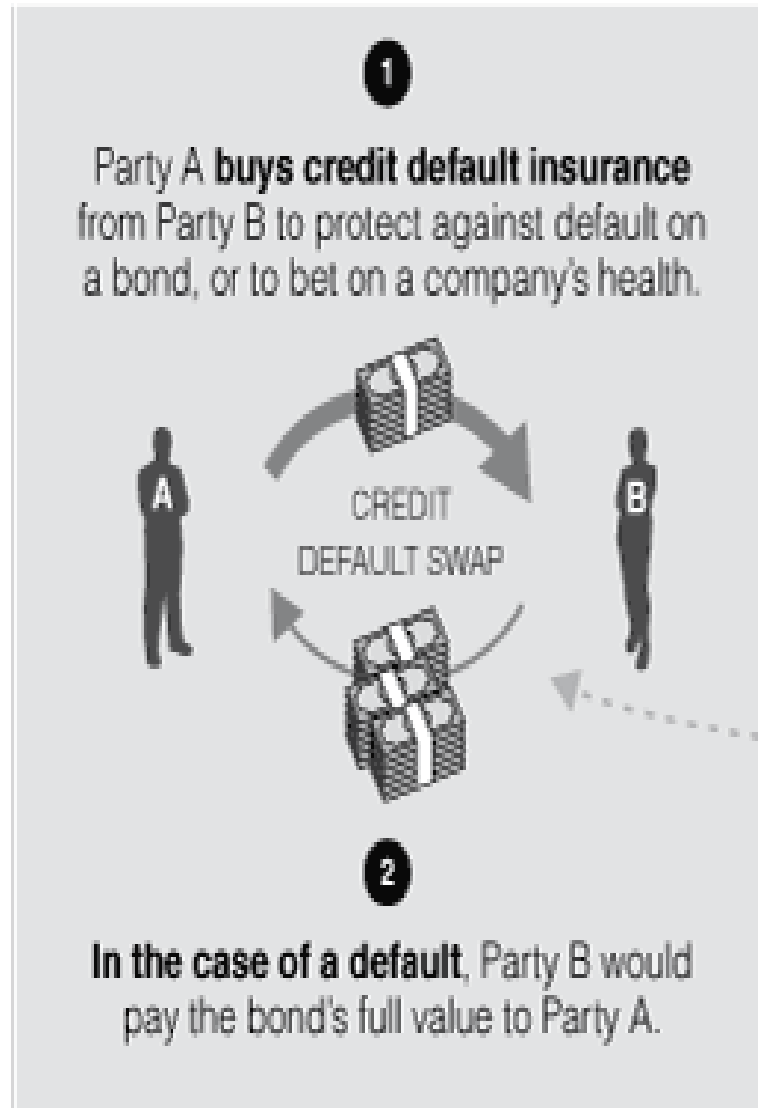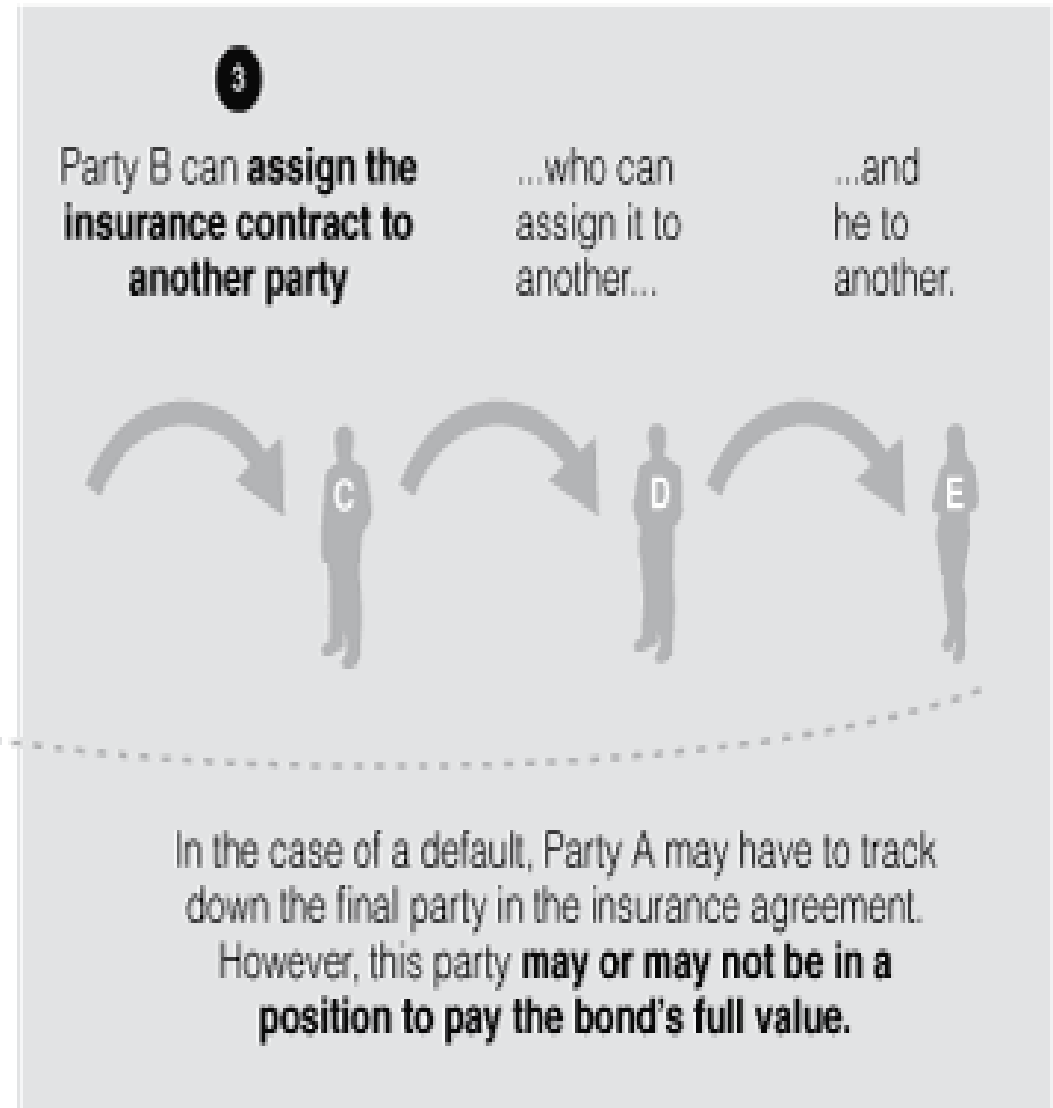
SOME LESSONS

➢ Central Banks should adopt a broader macro-prudential views of asset price movements, credit boom and the build up of systematic risk.

➢ Asset price bubble leads to strong credit growth (in real estate and stock market).

➢ Only a substantial hike in policy rates can pick the bubble.

➢ Pre-emptive action like hike in risk weights and provision norms for banks.

➢ Sharper focus on liquidity risk management, risk transmission etc.

➢ Global imbalances are to be reduced to a manageable proportion.