Basics of Financial Assets and Markets

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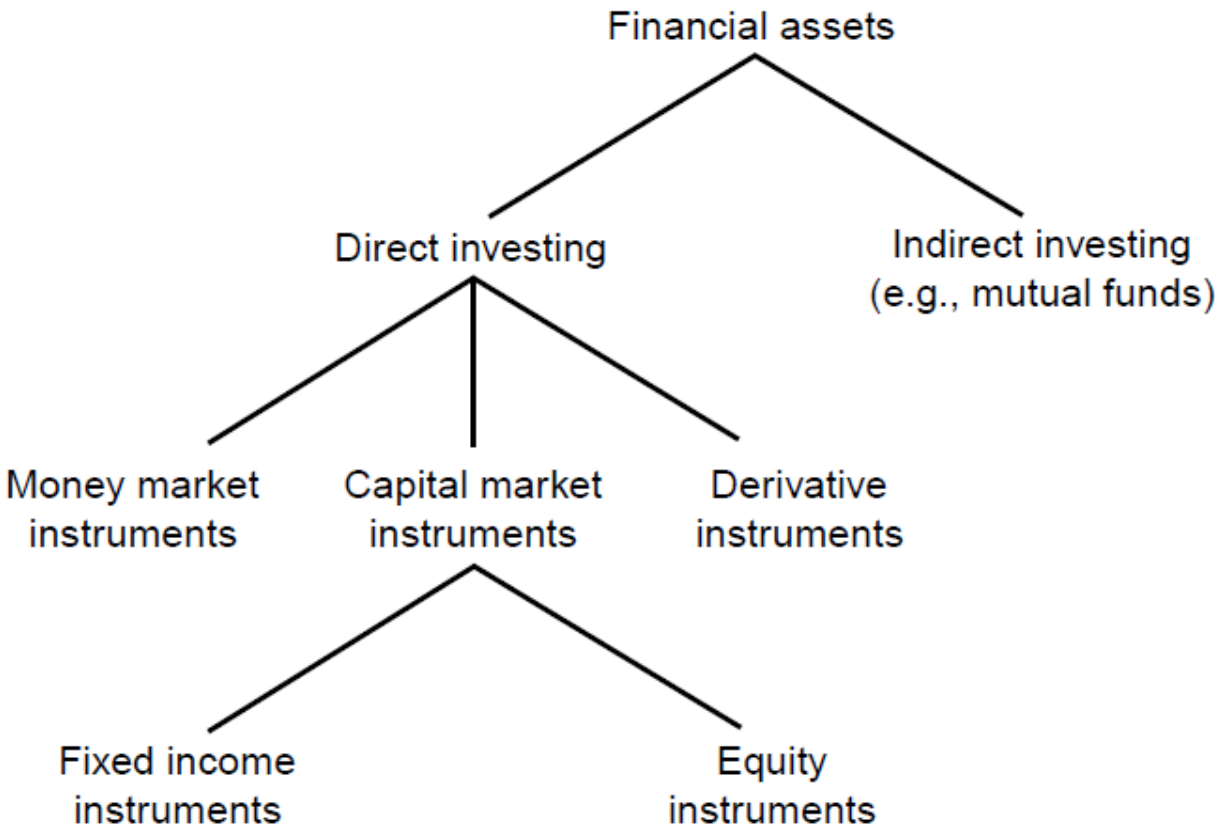
Financial Assets



Basics of Financial Assets and Markets

- Money Market
  - Money market securities are short-term debt instruments sold by governments, financial institutions, and corporations.
  - The important characteristic of these securities is that they have maturities at the time of issuance one year or less.

Money Market Instruments

Treasury bills
Repurchase agreement (repos or RPs)
LIBOR
Negotiable certificate of deposit (CDs)
Bankers' acceptances
Commercial paper
Eurodollars

Treasury Bills

- When the government is going to the financial market to raise money, it can do it by issuing two types of debt instruments – treasury bills and government bonds.
- Treasury bills are issued when the government need money for a shorter period while bonds are issued when it needs debt for more than say five years.
- In India, treasury bills are presently issued in three maturities, namely, 91 day, 182 day and 364 day.
- Treasury bills are zero coupon securities and pay no interest.

Treasury Bills

- Treasury bills are usually held by financial institutions including banks.
- Banks give treasury bills to the RBI to get money under repo and keep as a part of SLR.
- For example, a 91 day Treasury bill of Rs. 100/- (face value) may be issued at say 98.20, that is, at a discount of say, Rs. 1.80 and would be redeemed at the face value of Rs. 100/-.

Cash Management Bills (CMBs)

- In 2010, RBI introduced a new short-term instrument, known as Cash Management Bills (CMBs), to meet the temporary mismatches in the cash flow of the Government of India.
- The CMBs have the generic character of T-bills but are issued for maturities less than 91 days.
- Another similar method for the government to get short term money is Ways and Means Advances (WMA).
- Under WMA, the RBI gives temporary loan facilities to the centre and state governments as a banker to government for upto 90 days.

Repurchase Agreements (Repos)

- A repurchase agreement is an agreement between a borrower and a lender to sell and repurchase a government security.
- A borrower, usually a government securities dealer, will institute the repo by contracting to sell securities to a lender at a particular price and simultaneously contracting to buy back the government securities at a future date at a specified price.
- The difference between the two prices represents the return to the lender.

Repurchase Agreements (Repos)

- The maturity of a repo is usually very short (less than 14 days), with overnight repos being fairly common.
- Longer repos, often labeled **term repos** may have maturities of 30 days or more.
- The institution on the opposite side of the repo is said to have a reverse repo.
- The party doing the reverse repo contracts to buy a security at a particular price and to sell it back at a predetermined price and time.

Certificates of Deposits (CDs)

- CDs are time deposits with a bank.
- Banker's acceptance (BA) is a short-term debt instrument issued by a company that is guaranteed by a commercial bank.

The London Interbank Offered Rate (LIBOR)

- LIBOR is the rate at which large international banks in London lend money among themselves.
- It is important because it is used as a base rate for many types of longer-term loans, even in U.S. markets.
- The rates are usually set at either the Treasury bill rate plus a fixed amount or at the LIBOR rate plus a fixed amount.

The London Interbank Offered Rate (LIBOR)

- LIBOR comes in 7 maturities (from overnight to 12 months) and in 5 different currencies.
- Currencies: American dollar - USD LIBOR, British pound sterling - GBP LIBOR, European euro - EUR LIBOR, Japanese yen - JPY LIBOR, Swiss franc - CHF LIBOR
- Maturities: Overnight (1 day), 1 week, 1 month, 2 months, 3 months, 6 months and 12 months

Capital Market Securities

- Capital market securities include instruments with maturities greater than one year and those with no designated maturity at all.
- The market is generally divided according to whether the instruments contain a promised set of cash flows over time or offer participation in the future profitability of a company.

Fixed Income Securities

- Fixed income securities have a specified payment schedule. Most are traditional bonds and promise to pay specific amounts at specific times
- Usually this is in the form of pre-specified dates for the payment of interest and a specific date for the repayment of principal.

Treasury Notes and Bonds

- The government issues fixed income securities over a broad range of the maturity spectrum.
- Debt instruments from 1 to 10 years in maturity are called Treasury notes.
- Debt instruments with a maturity beyond 10 years are known as Treasury bonds.
- Both notes and bonds pay interest twice a year and repay principal on the maturity date.

Treasury Notes and Bonds

- One difference between Treasury bonds and notes is that some bonds are callable before maturity (most often during the last five years of the bond's life), while notes are not callable.
- Callability means that the government can force the holder of the bond to sell the bond back to the government according to a fixed schedule of prices before maturity.
- Debt instruments with a maturity beyond 10 years are known as Treasury bonds.

International Bonds

- When the money is borrowed by firms/government from foreign destination, denominated in foreign currency.

- Two major types:
  - **Euro Bond**: In Euro bond, a foreign company issues a bond denominated in a currency which is not the home currency of the investors.
  - For example, US company issues bond and raises capital in Japan denominated in US Dollar

  - **Foreign Bond**: is a bond where foreign company issues bond denominated in the currency denomination of the foreign country.
  - For example, US company issues bond and raises capital in Japan denominated in Japanese Yen.

International Bonds

- When the money is borrowed by firms/government from foreign destination, denominated in foreign currency.

- Types of F-bonds:
  - **Yankee Bonds**: Foreign Bonds sold in U.S.
  - **Samurai Bonds**: Foreign Bonds sold in Japan.
  - **Bulldog Bonds**: Foreign Bonds sold in U.K.
  - **Rembrandt Bond**: Foreign Bonds sold in Netherland.
  - **Matador Bond**: Foreign Bonds sold in Spain.
  - **Maple Bond**: Foreign Bonds sold in Canada.
  - **Kangaroo Bond**: Foreign Bonds sold in Australia.
  - **Masala Bond**: Rupee denominated bonds issued in foreign.
- Sovereign bonds are issued by the government of a country representing bonds issued by a country.

International Bonds

- When the money is borrowed by firms/government from foreign destination, denominated in foreign currency.

- Types of F-bonds:
  - **Zero coupon bond**: A company may issue zero coupon bonds to international investors. In a zero coupon bond, bonds are issued at a discount to the face value and when investors sale these bonds or at maturity, they receive a higher amount.
  - **Convertible bond**: A convertible bond behaves like plain vanilla fixed coupon bond for the some part of the bond and then gets converted to company's shares or ADRs/GDRs.
  - **Dual Currency Bonds**: In a dual currency bond, the principal and coupon rate denominated in two different currencies. Dual currency bonds are different from the dual trench Euro bonds issued. In a dual trench bond issue, a company simultaneously offers bonds in two different currencies, let us say, USD and Yen.

ADR/GDR

- American Depository Receipt (ADR) and Global Depository Receipt (GDR).

- Types of F-bonds:
  - **ADR**: ADR is a negotiable instrument issued by a US bank, representing non-US company stock, trading in the US stock exchange.
  - Foreign companies can trade in US stock market.

  - **GDR**: GDR is a negotiable instrument issued by the international depository bank, representing foreign company's stock trading globally.
  - Foreign companies can trade in any country's stock market other than the US stock market.
- ADR is listed in American Stock Exchange i.e. New York Stock Exchange (NYSE) or National Association of Securities Dealers Automated Quotations (NASDAQ). Whereas, GDR is listed in non-US stock exchanges like London Stock Exchange or Luxembourg Stock Exchange.

Not-So-Fixed Income Securities

- Two classes of fixed income securities have even greater variability in cash flows: **Preferred Stocks** and **Mortgage-backed Securities (MBS)**.
- Preferred Stock: It promises to pay to the holder periodic payments like coupons, but these are called dividends rather than interest.
- Preferred stock occupies a middle position between bonds and common stock in terms of priority of payment of income and in terms of return on capital if the corporation is liquidated.

Not-So-Fixed Income Securities

- **Asset-Backed Securities**
  - An asset-backed security is a contractual claim on a pool of securities—typically loans.
  - These include home mortgages, commercial mortgages, automobile loans, student loans, and credit card debt.
  - Collectively referred to as **collateralized debt obligations (CDO)**, they are usually structured so that there are several classes, known as tranches, with different maturities and different levels of risk.

Not-So-Fixed Income Securities

- **Asset-Backed Securities**
  - Collateralized mortgage obligations are backed by pools of mortgages, and CDOs are backed by pools of commercial or personal loans.
  - Collateralized bond obligations are backed by low investment-grade corporate bonds.
  - Asset-backed securities are the product of a series of financial innovations in the late twentieth century

Not-So-Fixed Income Securities

- **Mortgage-Backed Securities**
  - A mortgage-backed security (MBS) is a type of asset-backed security that is secured by a mortgage or collection of mortgages.
  - This security must also be grouped in one of the top two ratings as determined by an accredited credit rating agency, and usually pays periodic payments that are similar to coupon payments.
  - Furthermore, the mortgage must have originated from a regulated and authorized financial institution.

Common Stock (Equity)

- Common stock represents an ownership claim on the earnings and assets of a corporation.
- After holders of debt claims are paid, the management of the company can either pay out the remaining earnings to stockholders in the form of dividends or reinvest part or all of the earnings in the business.
- The unique feature of common stock (unlike simply owning the business) is that the holder of common stock has limited liability.
- If a company goes bankrupt, all that the holder of common stock can lose is his or her original investment in the stock.

Derivative Instruments

- Derivative instruments are securities whose value derives from the value of an underlying security or basket of securities.
- The most common are options and futures.
- An option on a security gives the holder the right to either buy (a call option) or sell (a put option) a particular asset or bundle of assets at a future date or during a particular period of time for a specified price.
- The buyer pays a price for this option but is free not to exercise this option if prices move in the wrong direction.

Derivative Instruments

- A future is the obligation to buy a particular security or bundle of securities at a particular time for a stated price. A future is simply a delayed purchase of a security. Futures and options are securities that represent side bets on the performance of individual or bundles of securities.

Indirect Investing

- While an investor can purchase any of the instruments described above, the investor can instead choose to invest indirectly by purchasing the shares of investment companies (mutual funds).
- Investment companies are financial intermediaries that collect funds from individual investors and invest those funds in a potentially wide range of securities or other assets.
- A mutual fund holds a portfolio of securities, usually in line with a stated policy and objective.

Indirect Investing:Types of Investment Companies

- **Unit Investment Trusts**
  - A unit investment trust (UIT) is a registered trust in which a fixed portfolio of income-producing securities is purchased and held to maturity.
  - Another form is: When a firm buys a portfolio of securities that are deposited into a trust It then sells shares, or "units" in the trust, called redeemable trust certificates.
  - All income and payments of principal from the portfolio are paid out by the fund's trustees (a bank or trust company) to the shareholders.

Indirect Investing: Mutual Funds

- Investors buy shares in investment companies, and ownership is proportional to the number of shares purchased
- The value of each share is called the net asset value, or NAV.
- Net asset value (NAV) equals market value of assets minus liabilities expressed on a per-share basis:

$$\text{Net asset value} = \frac{\text{Market value of assets - liabilities}}{\text{Shares Outstanding}}$$

Indirect Investing:Types of Investment Companies

- **Commingled Funds**
  - Commingled funds are partnerships of investors that pool funds. The management firm that organizes the partnership, for example, a bank or insurance company, manages the funds for a fee.

Indirect Investing:Types of Investment Companies

- **Real Estate Investment Trusts (REITs)**
  - It's a type of company that lets investors pool their money to invest in a collection of properties or other real estate assets.
  - A REIT must invest at least 75% of its total assets in real estate of various types. It also must get at least 75% of its gross income either in the form of rental income from real property, or from mortgage interest or real estate sales.

Indirect Investing:Types of Investment Companies

- **Equity and Mortgage (REITs)**
  - **Equity REITs**, which own real estate directly and charge tenants rent, and **Mortgage REITs**, which invest in securities backed by the mortgages that real estate buyers use to finance their purchases.
  - To qualify as a REIT, corporations must have no fewer than 100 shareholders. Moreover, a REIT can't be too concentrated in the hands of a select group of investors, as no five individual shareholders can have more than a 50% stake in the REIT.
  - As with most businesses, REITs must be managed by a board of directors or trustees.

Indirect Investing:Types of Investment Companies

- **Hedge Funds**
  - A hedge fund is an alternative investment vehicle available only to sophisticated investors, such as institutions and individuals with significant assets.
  - Like mutual funds, hedge funds are pools of underlying securities. Also like mutual funds, they can invest in many types of securities—but there are a number of differences between these two investment vehicles.

Indirect Investing:Types of Investment Companies

- **Major Hedge Funds**
  - BlackRock – $4.6 trillion
  - J.P. Morgan Asset Management – $1.7 trillion
  - Bridgewater Associates – $197 billion
  - D.E. Shaw & Co. – $84.36 billion
  - Credit Suisse Asset Management – $52.5 billion
  - Two Sigma – $52 billion

Stock Market Indices

- Dow Jones Industrial Average Index (DJIA)
- Nikkei 225 (Nikkei 225)
- Standard and Poor's Composite 500
- FTSE-50
- BSE-30
- NSE-50

Trading Mechanics

- **Market Orders**
  - Market order directs the broker to buy or sell the security at the best available price.
  - For example, assume TATA MOTORS is quoted Rs. 80.20 bid and offered at Rs. 80.30 (per share).
  - This means that someone is willing to buy at Rs. 80.20, and someone else (or perhaps the same trader) is willing to sell at Rs. 80.30.
  - Thus an investor placing a market order to buy 100 shares would expect to pay Rs. 80.30 per share (a total of Rs. 8,030) plus the commission (the broker's fee).
  - An investor placing a market order to sell 100 shares would expect to receive Rs. 80.20 per share (a total of Rs. 8,020) less the commission.

Trading Mechanics

- **Limit Orders**
  - With a limit order, the customer states a price that specifies the worst acceptable terms of trades.

Trading Mechanics

- **Short Sale**
  - Investors can sell securities they do not own. This type of trade is referred to as a short sale.
  - When an investor short sells a security, a security is physically sold.
  - Because the investor does not own the security, the brokerage firm borrows it from another investor or lends the security to the investor itself.

Trading Mechanics

- **Stop Orders**
  - A fourth type of order is one that is activated only when the price of the stock reaches or passes through a predetermined limit.
  - The price that activates the trade is called a stop price.
  - Once a trade takes place at the stop price, the order becomes a market order.
  - For example, a stop loss order at \$40 is activated only if trades of others take place at \$40 or less.
  - If trades take place at \$40 or less, the order is activated and the order becomes a market sell order.

Asset return calculations

- Consider purchasing an asset (e.g., stock, bond, ETF, mutual fund, option, etc.) at time t_0 for the price P_{t0} and then selling the asset at time t_1 for the price P_{t1}. If there are no intermediate cash flows (e.g., dividends) between t_0 and t_1 the rate of return over the period t_0 to t_1 is the percentage change in price:

$$(R_{t0,t1}) = \frac{P_{t1} - P_{t0}}{P_{t0}}$$

- The time between t_0 and t_1 is called the holding period is called the holding period return.

- Let P_t denote the price at the end of month t of an asset that pays no dividends and let P_{t-1} denote the price at the end of month t 1. Then the one-month simple net return on an investment in the asset between months t-1 and t is defined as:

$$(R_t) = \frac{P_t - P_{t-1}}{P_t}$$

- Writing $\frac{P_t - P_{t-1}}{P_t} = \frac{P_t}{P_{t-1}} - 1$
- We can define the **simple gross return** as

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

Simple return calculation

- Consider a one-month investment in TATA stock. Suppose you buy the stock in month $t-1$ at $P_{t-1} = Rs.85$ and sell the stock the next month for $P_t = Rs.90$. The one-month simple net and gross returns are then

$$(R_t) = \frac{90-85}{85} = \frac{90}{85} - 1 = 1.0588 - 1 = 0.0588$$
$$(1 + R_t) = 1.0588$$

  - The one-month investment in TATA yielded a 5.88% per month return.

Computing portfolio return

- Consider a portfolio of TATA and GODREJ stock in which you initially pruchase ten shares of each stock at the end of month $t-1$ at the prices $P_{tata,t-1} = Rs.85$ and $P_{godrej,t-1} = Rs.30$, respectively.
- The initial value of the portfolio is $V_{t-1} = 10 \times 85 + 10 \times 30 = 1,150$. The portfolio shares are $w_{tata} = 850/1150 = 0.7391$, and $w_{god} == 300/1150 = 0.260$.
- Suppose at the end of month t, $P_{tata,t} = 90$ and $P_{godrej,t} = Rs.28$.
- Assuming that TATA and Godrej do not pay dividend between periods $t-1$ and t, the one-period return on the two stocks are:

$$(R_{tata,t}) = \frac{90-85}{85} = 0.0588$$
$$(R_{god,t}) = \frac{28-30}{30} = -0.0667$$

Computing portfolio return

- The one month rate of return on the portfolio is then

$$(R_{p,t}) = \times(0.7391)(0.0588) + (0.2609)(-0.0667) = 0.02609$$

With dividends

- If an asset pays a dividend, D_t, sometime between months $t-1$ and t, and total net return calculation becomes total net return calculation becomes

$$(R_t^{total}) = \frac{P_t + D_t}{P_{t-1}}$$

  - Consider a one-month investment in TATA. Suppose you buy the stock in month $t-1$ at $P_{t-1} = 85$ and sell the stock the next month for $P_{t-1} = 90$. Further assume that TATA pays a Rs. 1 dividend between months $t-1$ and t The capital gain, dividend yield and total return are then

$$(R_{,t}) = \frac{90+1-85}{P_{85}} = 0.707$$

  - The one-month investment in TATA yields a 7.07% per month total return.

Adjusting for Inflation

- The real return on an asset over a particular horizon takes into account the growth rate of the general price level over the horizon.
- The computation of real returns on an asset is a two step process:
  - Deflate the nominal price of the asset by the general price level.
  - Compute returns in the usual way using the deflated prices.

Adjusting for Inflation

- Let P_t denote the nominal price of the asset at time t and let CPI_t denote an index of the general price level (e.g. consumer price index) at time t. The deflated or real price at time t is:

$$P_t^{Real} = \frac{P_t}{CPI_t}$$

- and the formula of return calculation is same as nominal.

Continuously compounded returns

- Let R_t denote the simple monthly return on an investment. The continuosly compounded monthly return, r_t is defined as:

$$r_t = Ln(1 + R_t) = Ln(\frac{P_t}{P_t - 1})$$

- to see why r_t is called the continuously compounded growth rate in prices between months $t - 1$ and t without any compounding.

- take the exponential from both sides of above expression:

$$e^{rt} = 1 + R_t = \frac{P_t}{P_t - 1}$$
after rearranging we get
$$P_t = P_{t-1} \times e^{rt}$$

Continuously compounded returns

- This is to contrasted with the simple return R_t which is simply the growth rate in prices between months $t-1$ and t without any compounding.

$$r_t = Ln(\frac{P_t}{P_t - 1})$$

  - $r_t = Ln(90) - Ln(85) = 4.4998 - 4.4427 = 0.0571$
  - r_t is smaller than R_t.
  - R_t can be obtained from r_t as $R_t = e^{rt} - 1$
  - which is $e^{0.0571} - 1 = 0.0588$

Functions of Financial Markets and Institutions

- Facilitates the price discovery
- Provides marketability and liquidity
- Settling payments and clearing

Thanking You