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Financial Institutions and Markets

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Systematic Risks in Financial System

What is Risk?

- Risk is a situation wherein objective probability distribution of the values a variable is known, even though the exact values it would take are not known.
- The objective probability is one which is supported by rigorous theory, past experience, and the laws of chance.
- the risk can be defined as the chance that the expected or prospective advantage, gain, profit or return may not materialise; that the actual outcome of investment may be less than the expected outcome.
- The greater the variability or dispersion in the possible outcomes, or the broader the range of possible outcomes, the greater the risk.

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Measures of Risk

- The variance and standard deviation of return serve as the alternative statistical measures of the risk of the security in an absolute sense
- Covariance measures the risk of the security relative to other securities in a portfolio
- Value-at-risk is a statistical measure of the riskiness of financial assets or portfolios of assets. It is defined as the maximum amount expected to be lost over a given time horizon, at a pre-defined confidence level. For example, if 95% one-month VAR is Rs. 5 million, there is 95% confidence that over the next month the portfolio will not lose more than Rs.5 million.

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Types of Risk

- The variability in a security's total return that is directly associated with the overall movements in the general market or economy is called **systematic risk**. This risk can not be diversified. The systematic risk arises due to the fluctuations of the macroeconomic fundamentals like interest rate, inflation etc.

- The variability in a security's total return that is not related to the overall market variability is called **unsystematic risk**. This type of risk can be diversified and it is specific to individual entity i.e. individual company. The unsystematic risk can also be called as idiosyncratic risk.

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Types of Systematic Risk

- Market Risk (Beta)
- Interest Rate Risk
- Inflation Risk
- Exchange Rate or Currency Risk

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Market Risk (Beta)

- **Beta** indicates the extent to which the risk of a given asset is non-diversifiable; it is a coefficient measuring a security's relative volatility. Statistically, beta is the covariance of a security's return with that of the market for a security class.
- It is the slope of the regression line relating a security return with the market return. The security with a higher (than 1) beta is more volatile than the market, and the asset with a lower (than 1) beta would rise or fall more slowly than the market.

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Interest Rate Risk

- Interest rate risk is the variability in return on security due to changes in the level of market interest rates
- Interest rate risk has two parts. First, the **price risk** resulting from the inverse relationship between the security price and interest rates.
- Second, the **reinvestment risk** resulting from the uncertainty about the interest rate at which the future coupon income or principal can be reinvested.
- These two parts of interest rate risk move in opposite directions.

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Inflation Risk

- Inflation risk is also known as purchasing power risk as there is always a chance or possibility that the purchasing power of invested money will decline, or that the real (inflation-adjusted) return will decline due to inflation.
- Inflation risk is really the risk of unanticipated or uncertain inflation

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Exchange Rate or Currency Risk

- Exchange rate risk refers to cash-flow variability experienced by economic units engaged in international transactions or international exchange, on account of uncertain or unexpected changes in exchange rates.
- There is no exchange rate risk under the fixed exchange rate system, while it is the highest under the freely floating exchange rate system.

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Country Risk

- Country risk is the degree to which political and economic unrest affect the securities of issuers doing business in a particular country

- It is the probability of loss due to political instability in the buyer's country resulting in inability to pay for imports.

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Reference

- Bhole, L.M and Mahakud, J (2017), Financial Institutions and Markets, Sixth Edition, McGraw Hill Education (India) Private Limited, Chennai, India

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Unsystematic Risks in Financial System

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Types of Unsystematic Risk

- Business Risk
- Financial Risk
- Default Risk
- Liquidity Risk
- Maturity Risk
- Call Risk

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Business Risk

- Business risk is the uncertainty of income flows that is caused by the nature of a firm's business
- This risk has two components: internal and external. The former results from the operating conditions or operating efficiency of the firm, and it is manageable within or by the firm. The latter is the result of operating conditions which the firm faces but which are beyond its control.
- Business risk is measured by the distribution of the firm's operating income (i.e., firm's earnings before interest and tax) over time

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Financial Risk

- Financial risk is associated with the use of debt financing by firms or companies
- There is a risk that the earnings of the firm may not be sufficient to meet these obligations towards the creditors
- The use of debt by the firm causes variability of return for both creditors and shareholders
- Financial risk is usually measured by the debt/equity ratio of the firm; the higher this ratio, the greater the variability of return and higher the financial risk

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Default Risk

- Default risk arises from the failure on the part of the borrower or debtor to pay the specified amount of interest and/or to repay the principal, both at the time specified in the debt contract or covenant or indenture
- The default risk has the capital risk and income risk as its components, and that it means not only the complete failure to pay but also the delay in payment

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Liquidity Risk

- Liquidity risk refers to a situation wherein it may not be possible to dispose off or sell the asset, or it may be possible to do so only at great inconvenience, and cost in terms of money and time
- The greater the uncertainty about time element, price concession, and transaction cost, the greater the liquidity risk
- For banks and financial institutions, liquidity risk refers to their inability to meet the liabilities towards depositors when they want to withdraw their deposits

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Maturity Risk

- Maturity risk arises when the term of maturity of the security happens to be longer
- Since foreseeing, forecasting and envisioning the environment, conditions and situations becomes more and more difficult as we stretch more and more into the future, the long-term investment involves risk

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Call Risk

- Call risk is associated with the corporate bonds which are issued with call-back provision or option whereby the issuer has the right of redeeming the bonds before their maturity
- In case of such bonds, the bond holders face the risk of giving up higher coupon bonds, reinvesting proceeds only at lower interest rates, and incurring the cost and inconvenience of reinvestment

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Return Concepts in Financial System

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What is Return?

- Return is the amount or rate of produce, proceeds, gain, profit which accrues to an economic agent from an investment
- It is a reward for and a motivating force behind investment
- The objective of the investor is usually to maximise return

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Return Components

- Return on a typical investment has two components: the basic one which is the periodic cash or income receipts, either interest or dividend; and the other which is the appreciation or depreciation in the price or value of the asset, called the capital gain or the capital loss
- The income component is usually but not necessarily received in cash viz., stock dividend
- The capital gain (or loss) is the difference between the purchase price of the asset and the price at which it can be or is sold
- The total return on an investment thus can be defined as income plus/minus price appreciation/depreciation

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Types of Return Concepts

- Expected return is an anticipated, predicted, desired, ex-ante return which is subject to uncertainty
- Realised return, on the other hand, is actually earned; it is an ex-post return
- Holding period return (HPR) measures the total return from an investment during a given or designated time period in which the asset is held by the investor. HPR = HPY + 1

$$\text{HPY} = \frac{\text{Any cash payments received} + \text{Price change over the holding period}}{\text{Price at which the asset is purchased (beginning price)}}$$

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Nominal and Real Return

- Nominal return is the return in nominal rupees (terms).
- Real return is equal to the nominal return adjusted for changes in prices i.e., the rate of inflation
- The relation between nominal and real return:
- (1 + Nominal Return) = (1+ Real Return) (1+ Inflation Rate)

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Required Rate of Return (RRR)

- The RRR for a security is defined as the minimum expected rate of return needed to induce or persuade an investor to purchase the security, given its risk
- The RRR has two components. First, the risk-free rate of return and second is the risk premium
- RRR = Risk-free rate of return + Risk premium
- Risk premium = f (macroeconomic fundamentals, industry specific variables and company specific variables)

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Calculation of RRR (Capital Asset Pricing Model)

- The Capital Asset Pricing Model (CAPM) is used in finance to determine a theoretically appropriate required rate of return of an asset, if that asset is to be added to an already well-diversified portfolio, given that asset's non-diversifiable risk
- The model takes into account the asset's sensitivity to non diversifiable risk (also known as systematic risk or market risk), often represented by beta (β)

The CAPM can be represented in equation as follows:

$$E(R_i) = R_f + \beta(R_m - R_f)$$

where $E(R_i)$ = Expected return of individual security, R_f = Risk-free rate of return, β = Market risk of individual security, R_m = market return.

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Testing CAPM

According to Capital Asset Pricing Model (CAPM) the market risk (β) is the sole factor which determine the expected return of the stock, which is used as the cost of equity of the company. For testing the validity of CAPM, generally we follow a two step procedure.

Step-1: Run the time series regression to estimate the market risk (β) following the equation

$$R_i = \beta(R_m)$$

Where, R_i = Individual Stock Return, R_m = Market Return

Step-2: After getting the (β) for each company/portfolio we run a cross sectional regression to examine whether (β) is statistically significant and for this, we have used the function

$\overline{R_i} = \alpha + \lambda(\beta)$. λ = premium: if the β will be statistically significant, then we can conclude that β gives the premium and the CAPM holds good.

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Fundamental Analysis of Financial Assets

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What is Fundamental Analysis?

- Fundamental Analysis is the examination of the underlying forces that affect the wellbeing of the economy, industry groups, and companies
- At the company level, fundamental analysis may involve examination of financial data, management, business concept and competition.
- At the industry level, there might be an examination of supply and demand forces for the products offered.
- For the national economy, fundamental analysis might focus on economic data to assess the present and future growth of the economy.
- To forecast future asset prices, fundamental analysis combines economic, industry, and company analysis to derive a asset's current fair value and forecast future value

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Economic Analysis

- The economic factors affect the value of the stock as due to change in the macroeconomic factors like business cycle, monetary policy, fiscal policy, inflation, both the expected cash flow and the discount rate get affected
- For example, a restrictive monetary policy which reduces the growth rate of money supply reduces the supply of funds for expansion of business and due to increase in the interest rate the cost of capital increases.
- Political instability, war, international markets fluctuations add to the uncertainty in business and therefore, the risk premium of the investor increases and also the discount rate and finally the value of the asset

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Industry Analysis

- The objective of the industry analysis is to identify which industry will prosper or suffer in different macroeconomic conditions
- The industry analysis answers certain questions such as (i) is there any difference between the returns for alternative industries during specific time periods, (ii) is the performance of the industry consistent over the time? (iii) is there a difference in the risk for alternative industries?
- The process of industry analysis is as follows: (i) Business cycle and various industries, (ii) economic changes and alternative industries, (iii) evaluation of life cycle of the industry and (iv) analysis of the competitive environment in an industry

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Company Analysis

- Comparison of an individual company's performance relative to the entire industry using various financial ratios which are based on the companies' profitability, efficiency, liquidity and growth opportunity
- This analysis helps the investor to answer the questions like (i) which are the best companies within the selected industry and (ii) what is the intrinsic value of the stock i.e. the intrinsic value is above the market value or below the market value?

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Company Analysis Cont…

- The SWOT analysis is applied to analyse the strength, weakness, opportunities and threats of the company within the industry.
- On the basis of various ratios the companies are classified in to different types such as growth companies, defensive companies, cyclical companies etc.
- The **growth company** is a company which is consistently able to make investments that yield the rate of return greater than the company's required rate of return.
- The **defensive company** is that company whose future earnings are likely to sustain in the recessionary period also.
- The **cyclical company's** sales and earnings are heavily influenced by the business cyclic conditions.

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Technical Analysis of Financial Assets

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What is Technical Analysis?

- Involves the examination of past market data such as prices and the volume of trading, which leads to an estimate of future price trends and therefore an investment decision.
- It believes that using data from the market itself is a good idea because the market is its own best predictor.

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Advantages of Technical Analysis

- Not heavily dependent on financial accounting statements
  - Problems with accounting statements:
    - 1. Lack information needed by security analysts
    - 2. Accounting Standards allows firms to select reporting procedures, resulting in difficulty comparing statements from two firms
    - 3. Non-quantifiable factors do not show up in financial statements
- Fundamental analyst must process new information and quickly determine a new intrinsic value, but technical analyst merely has to recognize a movement to a new equilibrium
- Technicians trade when a move to a new equilibrium is underway but a fundamental analyst finds undervalued securities that may not adjust their prices as quickly

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Technical Trading Rules and Indicators

- Asset price cycles typically go through a peak and trough
- Analyze the following chart of a typical asset price cycle and we will show a rising trend channel, a flat trend channel, a declining trend channel, and indications of when a technical analyst would want to trade

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Trading Rules

- **Contrary opinion**
  - Many analysts rely on rules developed from the premise that the majority of investors are wrong as the market approaches peaks and troughs
  - Technicians try to determine whether investors are strongly bullish or bearish and then trade in the opposite direction
- **Mutual fund cash positions**
  - Low liquidity implies funds fully invested (bullish) and market is near or at peak
  - High liquidity implies funds are bearish (Considered a good time to buy)
- **Confidence Index**
  - Ratio of average yield on top 10 grade corporate bonds divided by the yield on Stock markets' average of 40 bonds. If ratio is high it shows the bullish sign and if its low it gives the bearish sign.

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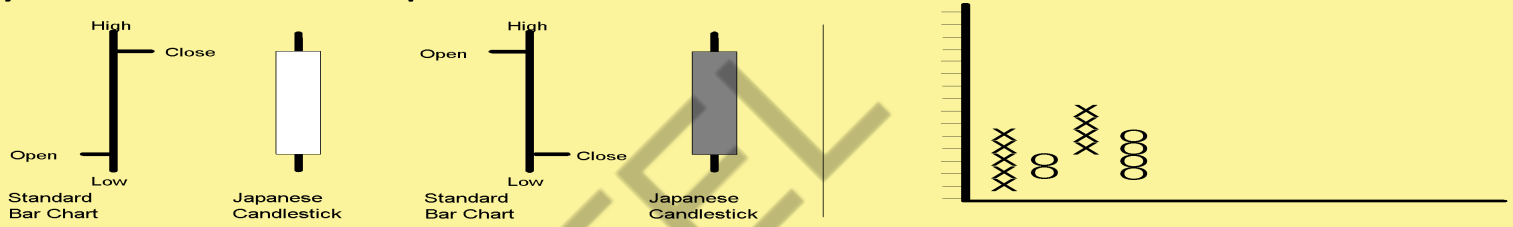
Trading Rules Cont…

- **Credit Balances in Brokerage Accounts**
  - Credit balances result when investors sell stocks and leave the proceeds with their brokers expecting to reinvest them shortly.
  - Technical analysts view these credit balances as potential power, a decline in these balances is considered bearish because it indicates lower purchasing power as the market approaches a peak. Alternatively a buildup of credit balances is an increase in buying power and a bullish signal.
- **Put –Call Ratio**
  - Contrary-Opinion technicians use put options which give the holder the right to sell stock at a specified price for a given time period, as signals of a bearish attitude. A higher put/call ratio indicates a pervasive bearish attitude which technicians consider a bullish indicator.
  - When the 70 % percent pf speculators are bullish the contrary opinion technicians say it is bearish market and it is a bullish signal when this declines to 30%

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Other Major Technical Indicators

- **Charting Stocks**
  - Chartists use bar charts, candlestick, or point and figure charts to look for patterns which may indicate future price movements.



- **Trend lines**
  - An Up trend where prices are generally increasing. An uptrend line has a positive slope and is formed by connecting two of more low points. The second low must be higher than the first for the line to have a positive slope.
  - A Down trend where prices are generally decreasing. A downtrend line has a negative slope and is formed by connecting two or more high points. The second high must be lower than the first for the line to have a negative slope

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Other Major Technical Indicators Cont…

- **Support and Resistance Line**
  - Support is the price level at which buyer tends to purchase the asset
  - Resistance is the price level at which selling is thought to be strong enough to prevent the price from rising further.
- **Moving Average Convergence/Divergence (MACD)**
  - MACD as the difference between a 12-day and 26-day moving average. A 9-day moving average of this difference is used to generate signals.
  - When this signal line goes from negative to positive, a buy signal is generated.
  - When the signal line goes from positive to negative, a sell signal is generated.

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Other Major Technical Indicators Cont…

- **Relative Strength Index (RSI)**
  - RSI is a rescaled measure of the ratio of average price changes on up days to average price changes on down days.
  - The most important thing to understand about RSI is that a level above 70 indicates a stock is overbought, and a level below 30 indicates that it is oversold (it can range from 0 to 100).
- **On Balance Volume**
  - OBV is calculated by adding volume on up days, and subtracting volume on down days. A running total is kept.
  - It is believed that “volume leads price.”
  - To use OBV, you generally look for OBV to show a change in trend (a divergence from the price trend).
  - If the stock is in an uptrend, but OBV turns down, that is a signal that the price trend may soon reverse.

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Other Major Technical Indicators Cont…

- **Bollinger Bands**
  - Bollinger Bands are based on a moving average of the closing price.
  - They are two standard deviations above and below the moving average.
  - A buy signal is given when the stock price closes below the lower band, and a sell signal is given when the stock price closes above the upper band.
  - When the bands contract, that is a signal that a big move is coming, but it is impossible to say if it will be up or down.
  - The buy signals are far more reliable than the sell signals.

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