

A person wearing a grey suit and a black watch is sitting at a desk, pointing at a laptop screen. The laptop screen displays a line chart with a blue line representing data over time. The chart has a grid and a legend box in the top right corner. The legend box contains the following text: Last Price 107.6446, High on 07/31/70 671.0079, Average 324.9556, Low on 01/31/80 88.6677. The x-axis of the chart is labeled with time periods: '75-'79, '80-'84, '85-'89, '90-'94, '95-'99, '00-'04, '05-'09, '10-'. The y-axis has labels 300, 500, and 600. The person's right hand is pointing at the chart, and their left hand is on the laptop keyboard.

DERIVATIVES – AN INTRODUCTION

Module 1

Concept of Risk

DEFINITION

Risk is often associated with the uncertainty of future returns. It involves the potential for actual returns to differ from expected returns. Beyond finance, risk is the possibility of harm, loss, or any undesirable event occurring. In the financial world, harm is typically measured in terms of monetary loss.

TYPES OF RISK

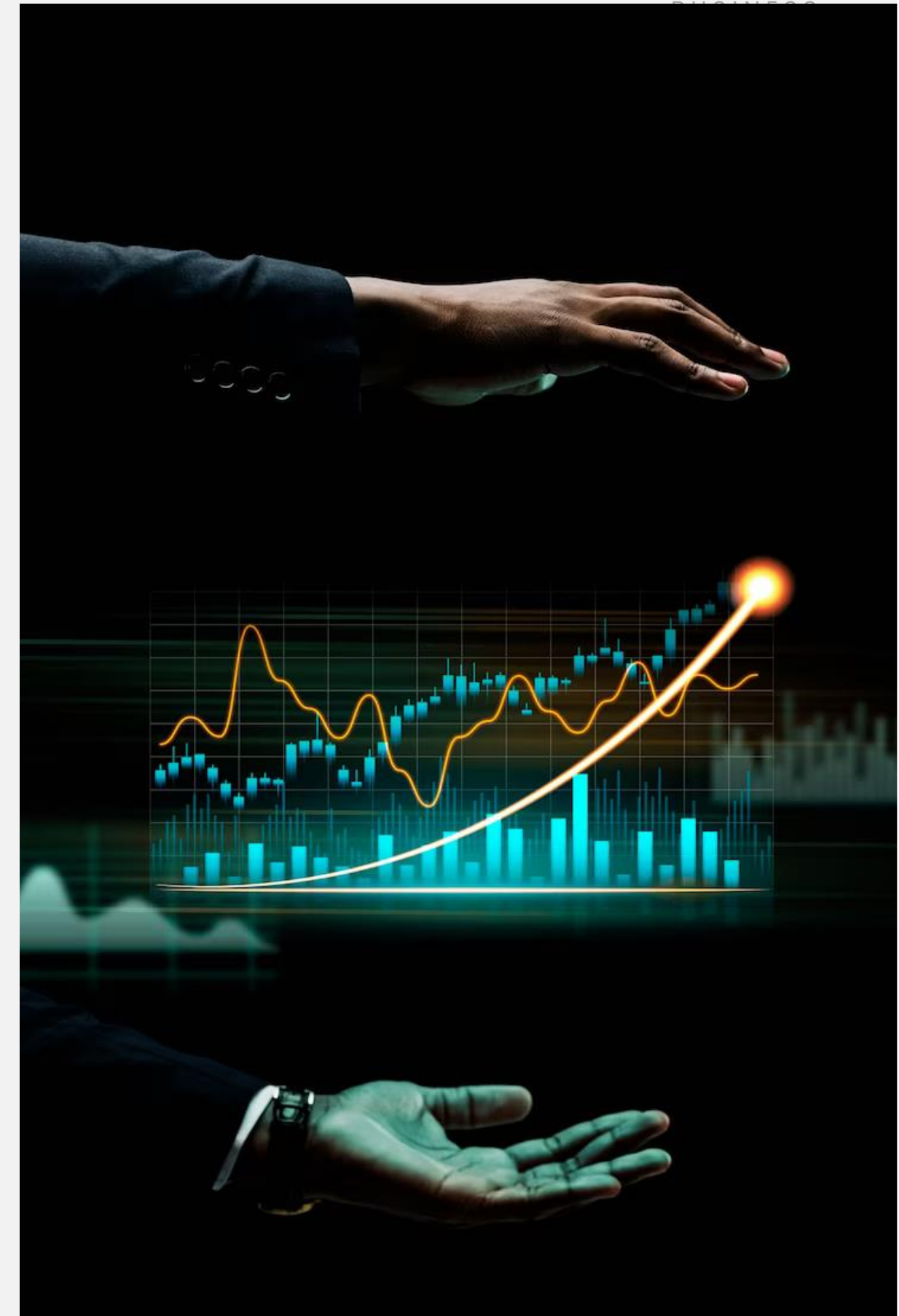
- Market Risk: Arises from changes in market prices, such as the risk of losses due to fluctuations in interest rates, exchange rates, or stock prices.
- Credit Risk: The risk of loss due to the failure of a borrower to repay a loan or meet contractual obligations.
- Operational Risk: Arises from internal processes, systems, people, or external events that can disrupt business operations.
- Liquidity Risk: The risk that an entity may not be able to meet its shortterm financial obligations.
- Systemic Risk: The risk that the entire financial system will suffer a collapse, often due to a widespread shock or crisis.

01.

Risk Appetite & Tolerance

Risk Appetite: The amount and type of risk that an organization is willing to accept to achieve its objectives.

Risk Tolerance: The level of risk that an organization or individual is willing to withstand.





Types of Enterprise Risk

01

Strategic Risks

These are risks associated with the longterm goals and objectives of the business. They arise from factors such as competition, market dynamics, technological changes, and geopolitical events.

02

Operational Risks

Operational risks pertain to the daytoday activities of a business. They involve the potential for disruptions, failures, or inefficiencies in internal processes, systems, or people.

03

Financial Risks

Financial risks involve the potential for adverse financial outcomes. This can include risks related to the availability of funds, currency fluctuations, interest rate changes, and credit issues.

04

Compliance Risks

These risks arise from the failure to comply with laws, regulations, and industry standards.

Noncompliance can result in legal actions, fines, and damage to the company's reputation.

LOGO

Types of Enterprise Risk

05

Reputational Risks

Reputational risks involve the potential damage to a company's reputation. These risks can be the result of negative public perception, ethical lapses, or other actions that harm the company's image.

06

Market Risks

Market risks are associated with changes in the economic environment and market conditions. They include factors such as changes in demand,

07

Supply Chain Risks

pricing, and competitive landscape. Risks associated with the sourcing, production, and distribution of goods and services. Disruptions in the supply chain can impact the availability of products and

08

Environmental Risks

services. Risks related to the impact of environmental factors on the business. This includes regulatory changes, climate-related risks, and sustainability concerns.



Financial Risk and Types

Market risk is the risk of losses in the value of financial instruments (e.g., stocks, bonds, currencies) due to changes in market variables such as interest rates, exchange rates, commodity prices, and equity prices.

Examples: Interest rate risk, currency risk, commodity price risk, equity price risk.

Financial Risk and Types

Credit Risk:

Definition: Credit risk, also known as default risk, is the risk of financial loss resulting from the failure of a borrower or counterparty to fulfill their contractual obligations, such as repaying a loan or meeting other financial commitments.

Examples: Nonpayment by borrowers, default on bonds, counterparty default in derivatives transactions.

Liquidity Risk:

Definition: Liquidity risk is the risk that a company may not be able to meet its shortterm financial obligations due to a lack of available cash or easily marketable assets.

Examples: Inability to meet shortterm debt obligations, illiquid market conditions

Operational Risk:

Definition: Operational risk involves the risk of financial loss resulting from inadequate or failed internal processes, systems, people, or external events.

Examples: System failures, fraud, human errors, natural disasters.

Foreign Exchange Risk (Currency Risk):

Definition: Foreign exchange risk arises from the exposure to changes in exchange rates, impacting the value of assets, liabilities, and cash flows denominated in foreign currencies.

Examples: Exchange rate fluctuations affecting international transactions, translation exposure.

Interest Rate Risk:

Definition: Interest rate risk is the risk that changes in interest rates will impact the value of financial instruments, particularly fixedincome securities.

Examples: Changes in interest rates affecting the value of bonds, impact on mortgagebacked securities.

Financial Risk and Types

Commodity Risk:

Definition: Commodity price risk is associated with fluctuations in the prices of raw materials or commodities that a company uses in its operations or that affect its cost structure.

Examples: Price volatility in oil, metals, agricultural commodities impacting production costs.

Refinancing Risk:

Definition: Refinancing risk is the risk that a company may face difficulties in refinancing its debt obligations, particularly if interest rates have risen or credit conditions have tightened.

Examples: Difficulty in rolling over shortterm debt, increased borrowing costs during refinancing.

Political and Regulatory Risk:

Definition: Political and regulatory risk involves the impact of changes in government policies, regulations, or political instability on a company's financial performance.

Examples: Changes in tax laws, trade policies, regulatory requirements, political instability affecting business operations.

Model Risk:

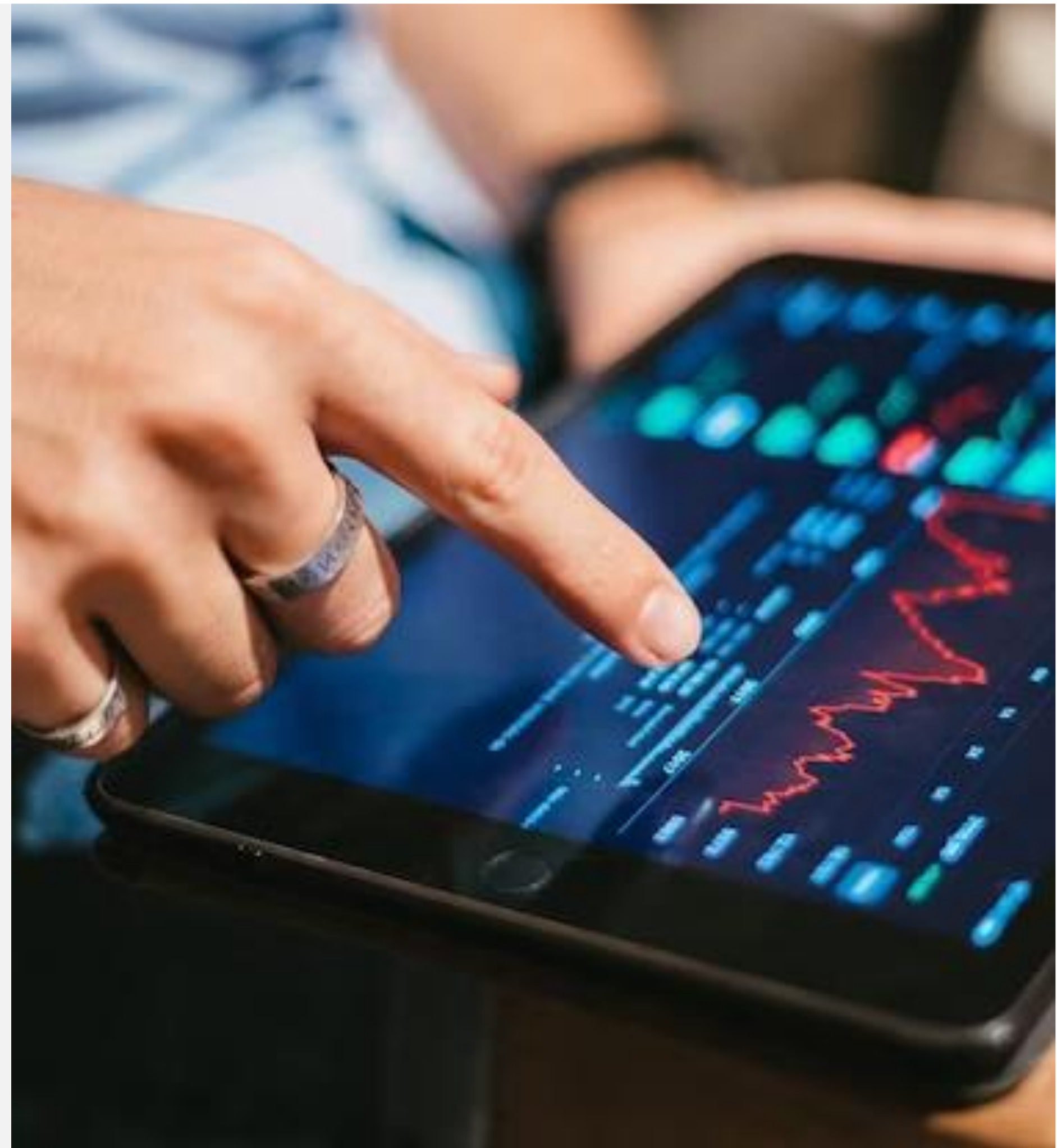
Definition: Model risk is the risk associated with the use of financial models for decisionmaking. It includes the potential for errors or inaccuracies in the models used for risk assessment and valuation.

Examples: Inaccurate forecasting models, flawed risk assessment models.

Risk Analysis in Capital Budgeting

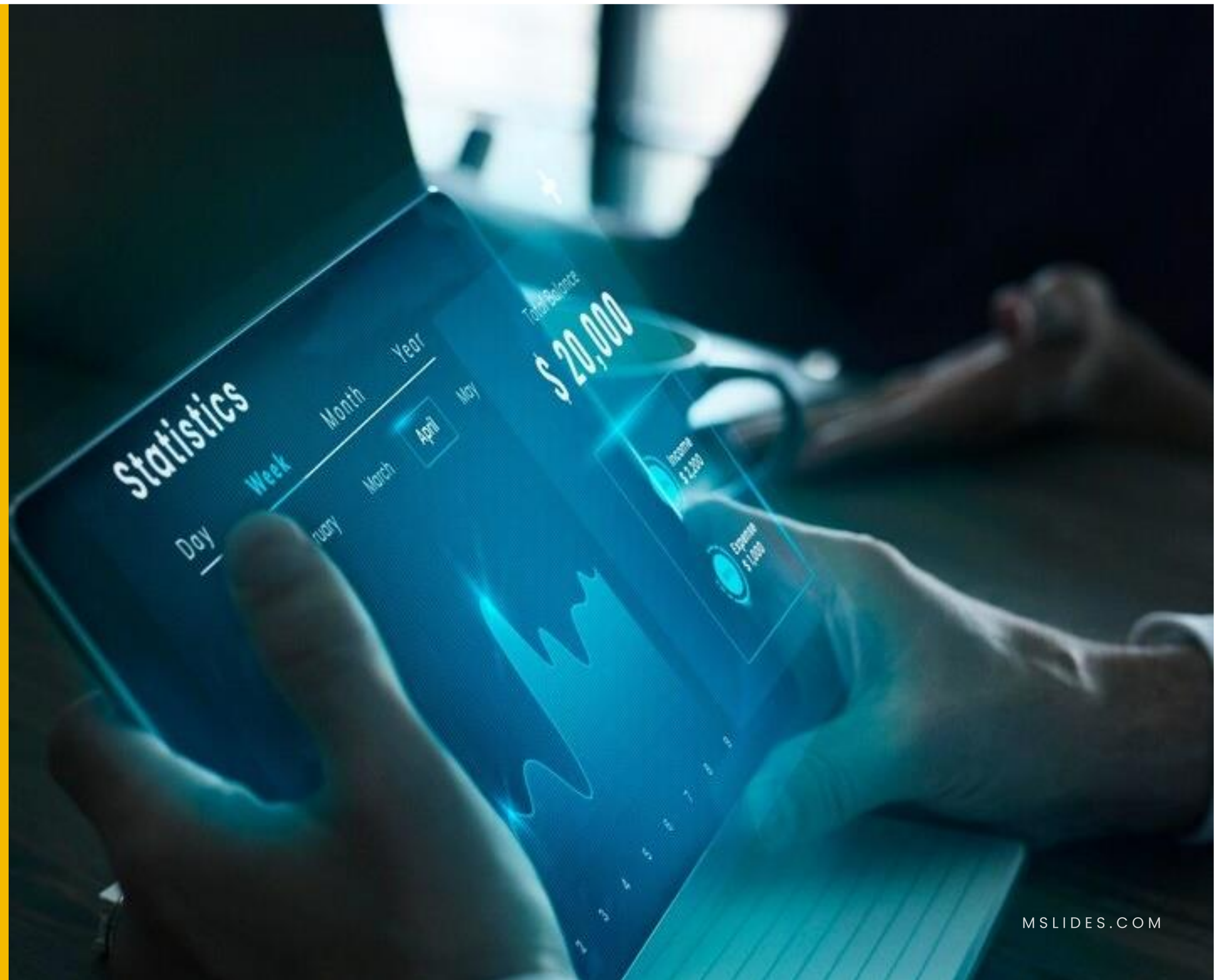
Risk analysis in capital budgeting is a crucial aspect of making informed investment decisions. Capital budgeting involves evaluating potential longterm investments and determining which projects are worthwhile for a company to pursue. Incorporating risk analysis helps in understanding the uncertainties associated with these investments.

- Begin by identifying the potential risks associated with each investment opportunity. These risks can be diverse and may include market risks, operational risks, regulatory risks, and more.



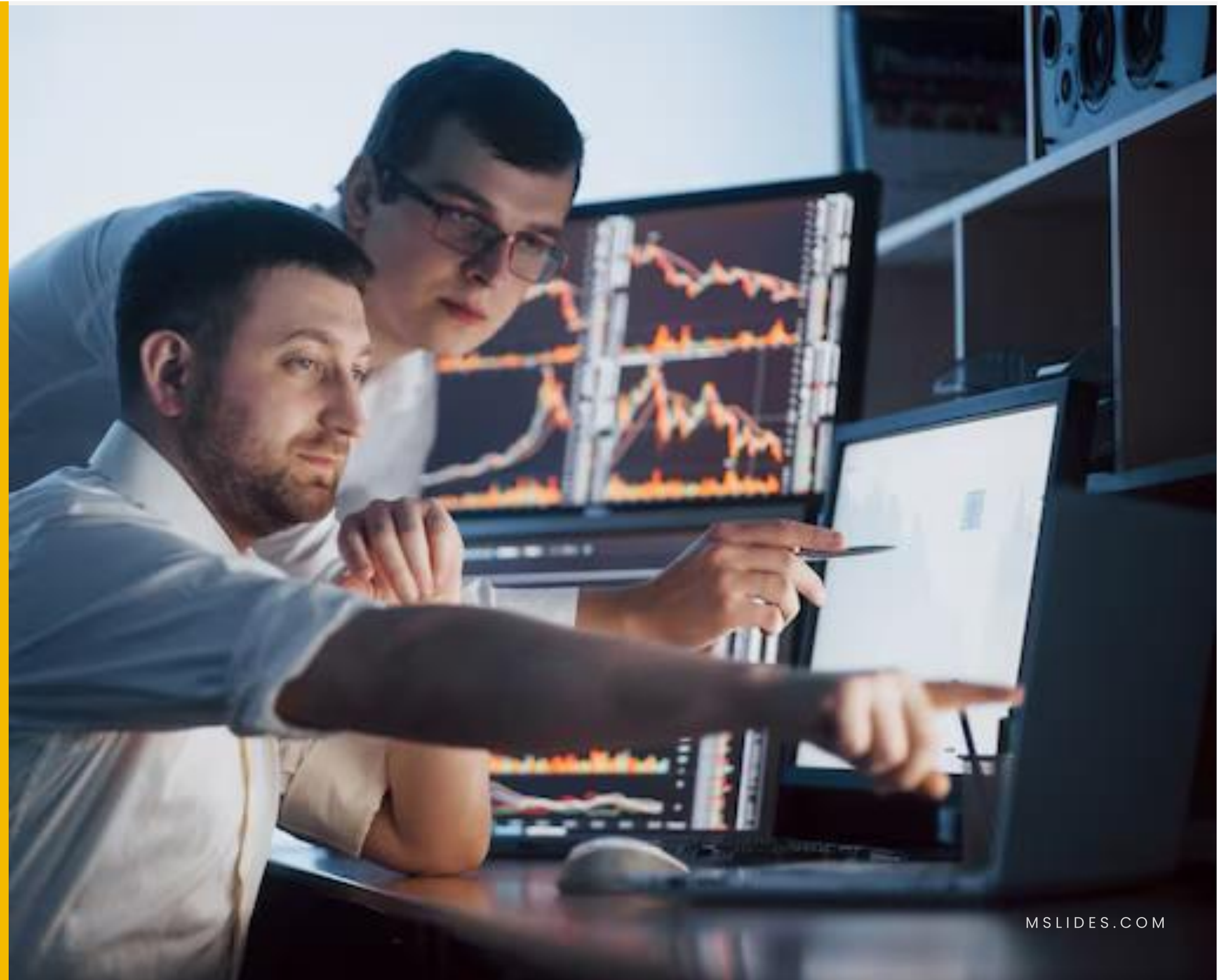
Sensitivity Analysis

Sensitivity analysis involves assessing how changes in one or more variables impact the outcomes of a project or investment. It helps identify which factors have the most significant influence on the project's financial metrics.



Scenario Analysis

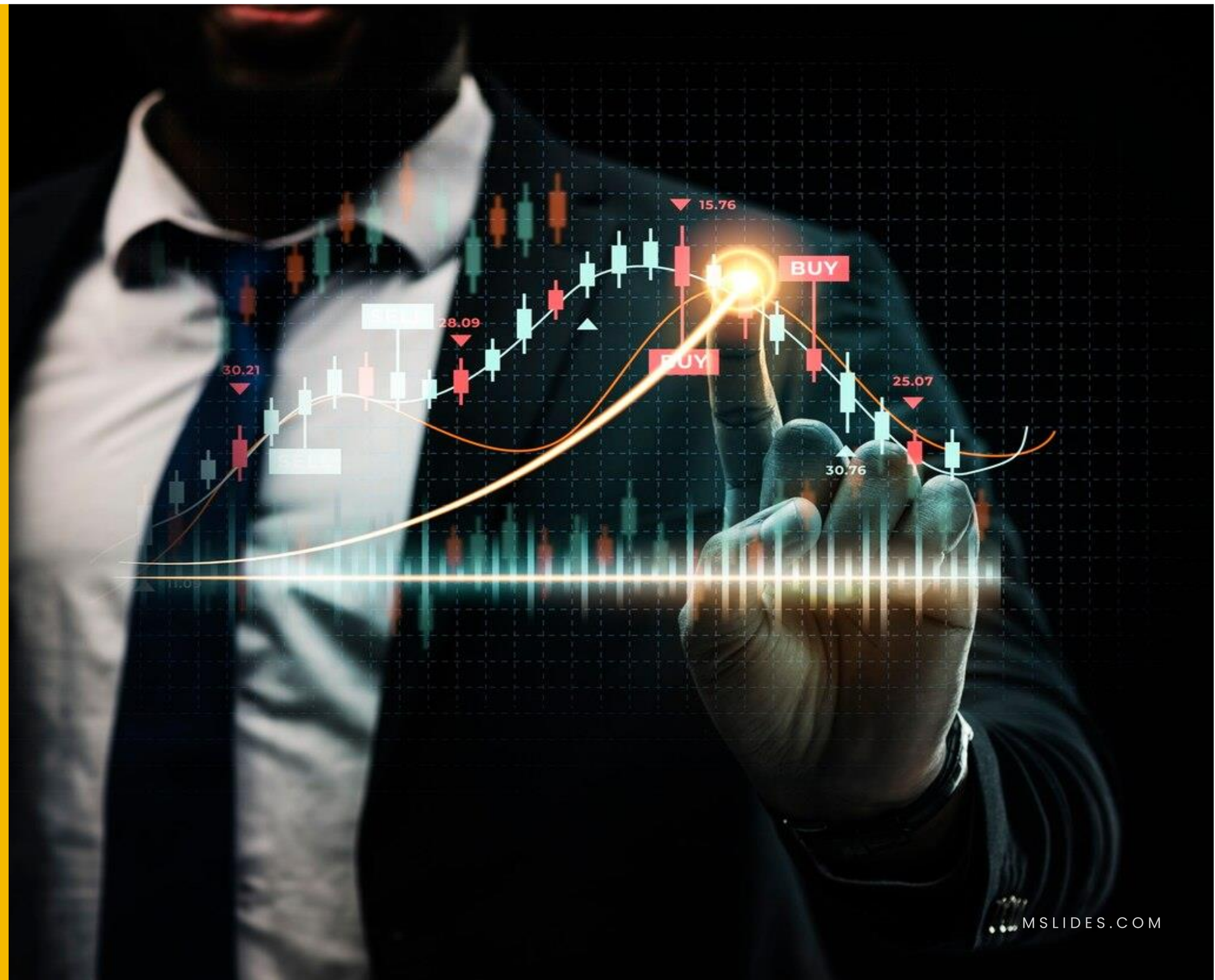
Scenario analysis involves evaluating the financial outcomes of a project under different plausible scenarios. It goes beyond sensitivity analysis by considering combinations of changes in multiple variables. Examining how the project performs under various conditions, such as bestcase, worstcase, and most likely scenarios, to understand the range of potential outcomes.



Simulation

Simulation involves using mathematical models to generate a range of possible outcomes based on random variations in input variables. Monte Carlo simulation is a common technique for this purpose.

Running multiple simulations to create a distribution of potential project outcomes, providing a more comprehensive view of risk and uncertainty.



Standard Deviation and Coefficient of Variation

A measure of the dispersion or variability of a set of values. In finance, it is often used to quantify the risk associated with an investment's expected return.

It's the ratio of the standard deviation to the mean, expressed as a percentage. CV provides a normalized measure of risk relative to the expected return.



Risk Adjusted Discount Rate Method

The riskadjusted discount rate (RADR) method involves adjusting the discount rate used in present value calculations to account for the riskiness of a project. Higherrisk projects are discounted at a higher rate.

It reflects the opportunity cost of capital adjusted for the risk profile of the investment, providing a more accurate assessment of the project's net present value.



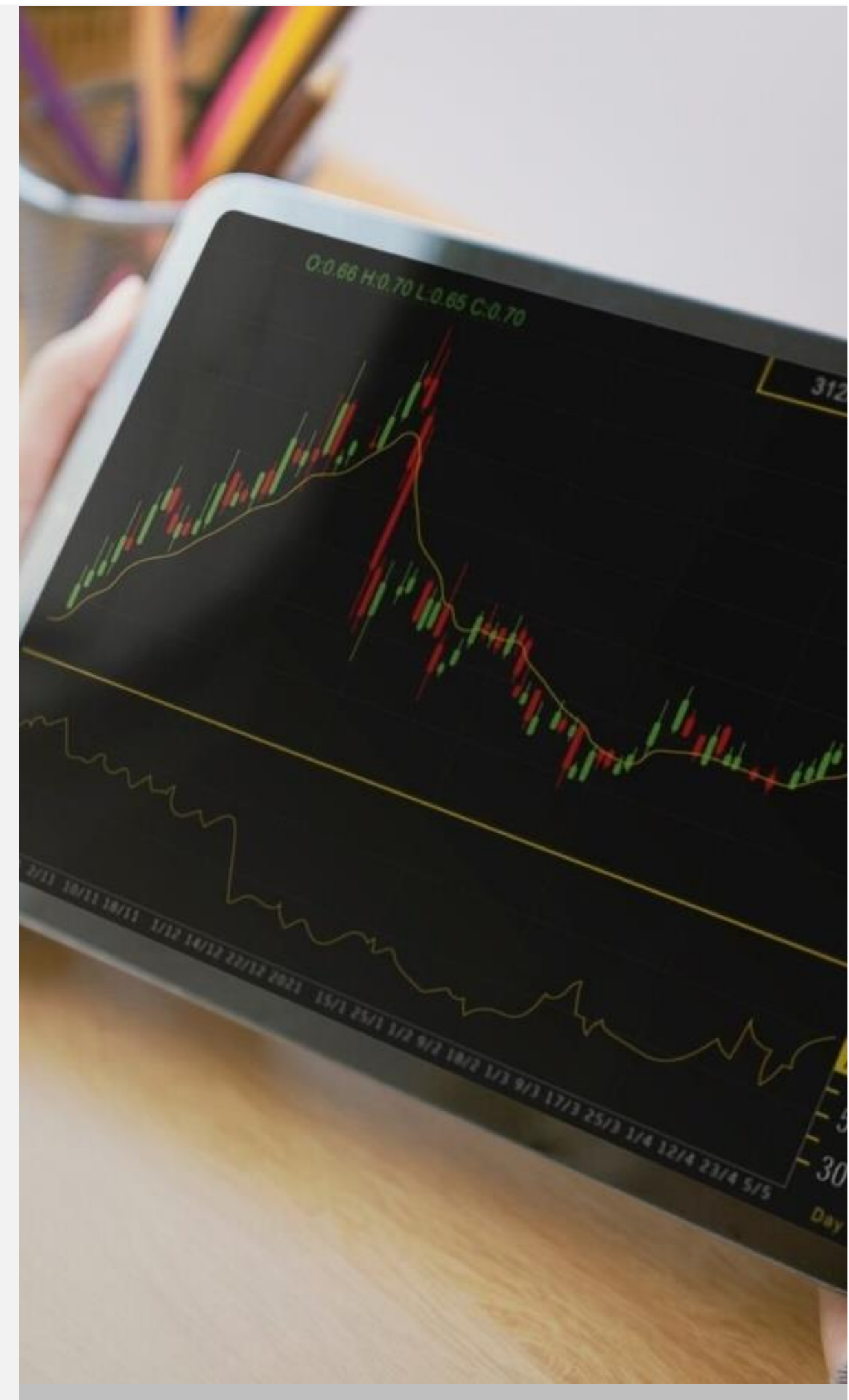
Certainty Equivalent Coefficient Method

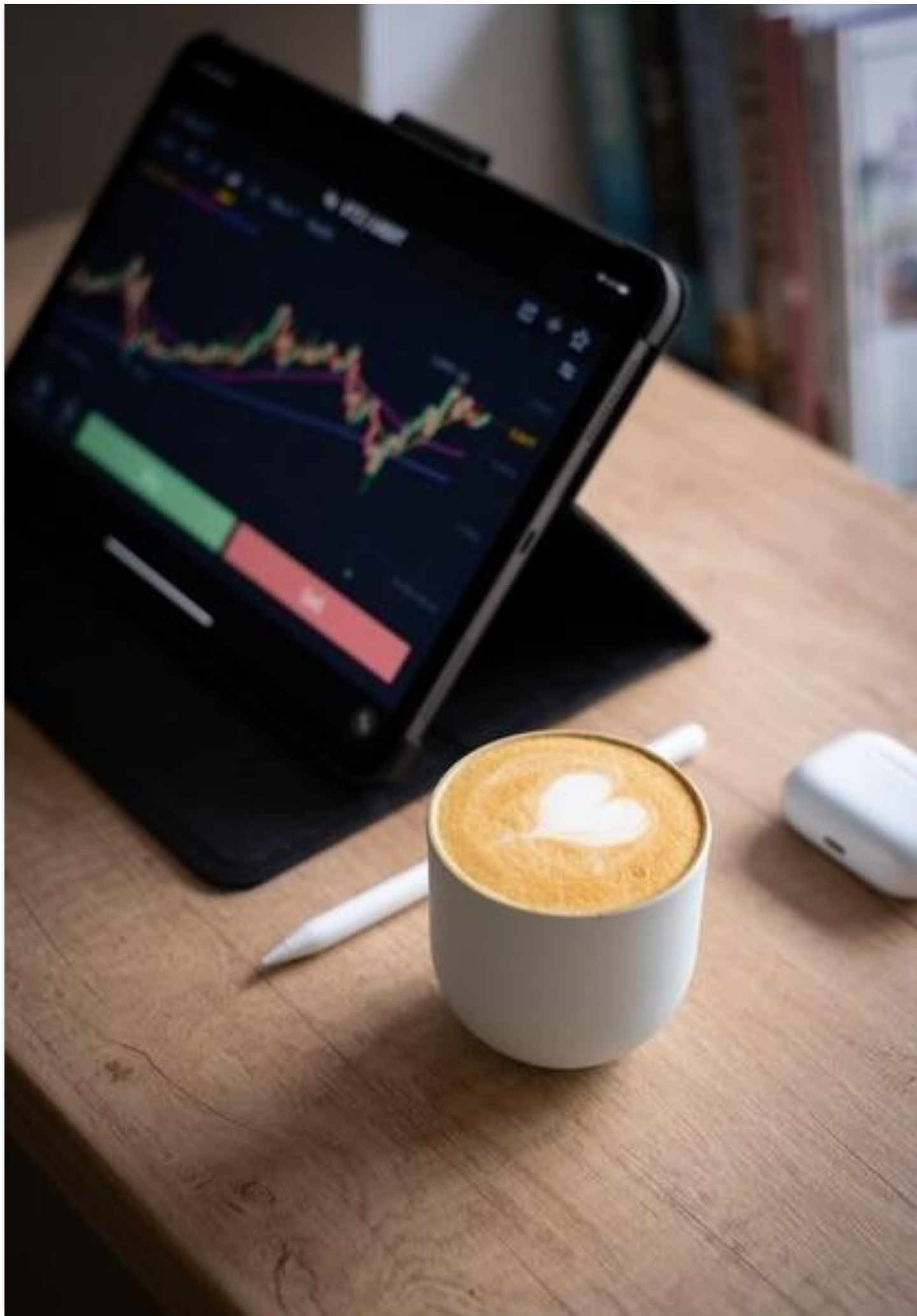
The Certainty Equivalent Coefficient (CEC) method is a technique used in decision analysis and capital budgeting to account for risk preferences when evaluating uncertain cash flows. This method incorporates an adjustment factor, known as the certainty equivalent coefficient, to adjust the expected cash flows for the level of risk involved.

Symbol: Often denoted as "r" (for the coefficient) or "CEC."

The certainty equivalent coefficient represents the percentage of certain (riskfree) cash flow that an individual or business would find equally satisfactory to an uncertain cash flow.

The coefficient ranges from 0 to 1, where 0 indicates high risk aversion (preferring certainty) and 1 indicates no risk aversion (equally valuing certain and uncertain cash flows).





Adjusting Expected Cash Flows

The expected cash flows from an investment or project are multiplied by the certainty equivalent coefficient to adjust for risk preferences.

Adjusted Cash Flow = Expected Cash Flow * Certainty Equivalent Coefficient

Acceptance Criteria: If the adjusted cash flows are positive, the project is considered acceptable or favorable under the certainty equivalent approach.

Rejection Criteria: If the adjusted cash flows are negative, the project may be considered unfavorable, and an alternative project with higher certainty equivalent cash flows might be preferred.

Decision Tree Analysis

Decision tree analysis is a visual tool that helps in assessing different possible outcomes and the associated decision points in a sequential manner. It's particularly useful in evaluating complex decisions involving multiple stages and uncertainties.

Decision trees can be applied to evaluate various options in derivatives trading. For example, a decision tree could be used to analyze whether to exercise an option at different points in time or to decide between different hedging strategies.

Decision tree analysis allows for the incorporation of probabilities at each decision node, reflecting the likelihood of different market scenarios. This helps in assessing the risk and reward associated with different derivative strategies.

Probability Distribution Method

The probability distribution method involves assigning probabilities to different possible outcomes of an event. This method is commonly used in risk management to quantify the likelihood of various scenarios.

In derivatives, probability distributions can be employed to estimate the potential future value of an asset or a derivative instrument. For instance, a probability distribution can be constructed for the future stock price, which is crucial in options pricing.

Understanding the probability distribution of future market movements is essential for risk management in derivatives trading. Traders and risk managers can use this information to assess the likelihood of profit or loss and make informed decisions.

Derivatives

Derivatives are financial instruments whose value is derived from the value of an underlying asset, index, rate, or other reference point. They are contracts between two parties—the buyer and the seller—wherein they agree to exchange cash or assets based on the future performance of the underlying entity. Derivatives are widely used in financial markets for various purposes, including hedging, speculation, and arbitrage



Futures Contracts



Options Contracts



Forward Contracts



Swaps

Types of Derivatives



Futures Contracts:

Futures contracts obligate the buyer to purchase and the seller to sell a specified quantity of an underlying asset at a predetermined price on a future date.



Options Contracts

Options give the buyer the right (but not the obligation) to buy (call option) or sell (put option) an underlying asset at a predetermined price within a specified timeframe



Forward Contracts

Similar to futures contracts, but usually traded overthecounter (OTC) rather than on organized exchanges. The terms are negotiated directly between the buyer and seller.



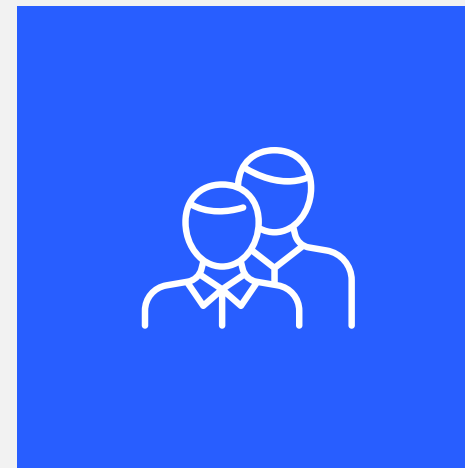
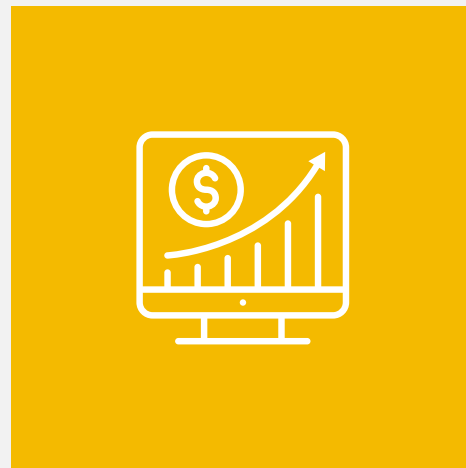
Swaps

Swaps involve the exchange of cash flows or other financial instruments between parties over a specified period. Common types include interest rate swaps and currency swaps

Elements of a Derivative Contract

Underlying Asset

The underlying asset is the financial instrument or reference point on which the derivative's value is based. It could be a physical commodity, financial instrument (like stocks or bonds), index, interest rate, currency, or other assets.

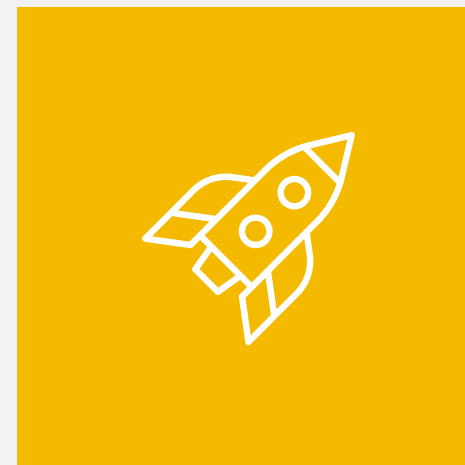


Contractual Parties

There are typically two parties in a derivative contract: the buyer (long position) and the seller (short position). The buyer has the right, and the seller has the obligation, to fulfill the terms of the contract. In some cases, the contract may involve more than two parties.

Contract Specifications

Derivative contracts specify the terms and conditions of the agreement, including the quantity or notional amount of the underlying asset, the contract's expiration or maturity date, and any other relevant terms. These details are crucial for understanding the rights and obligations of the parties involved.



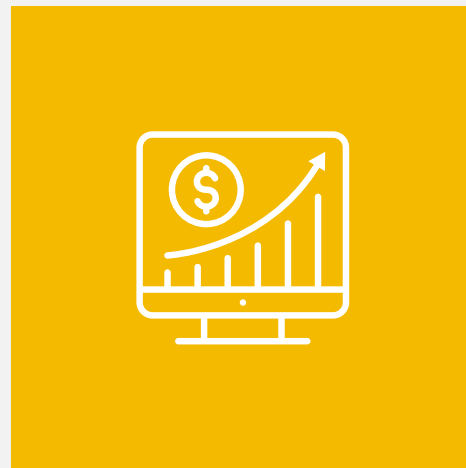
Contractual Price (Strike Price)

The contractual price, also known as the strike price or exercise price, is the price at which the underlying asset will be bought or sold if the contract is exercised. This price is predetermined and agreed upon by the parties when entering into the contract.

Elements of a Derivative Contract

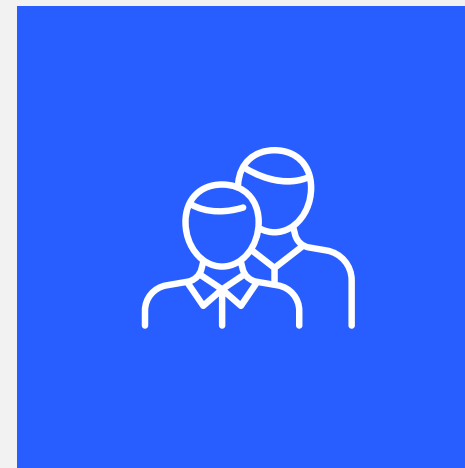
Expiration/Maturity Date

The expiration or maturity date is the date when the derivative contract ceases to be valid. At this point, the parties must either settle the contract or execute the agreedupon transaction. Derivatives can be classified as either options or futures, depending on whether they have a fixed expiration date.



Option Type (For Options)

If the derivative is an option, the contract will specify whether it is a call option (giving the right to buy) or a put option (giving the right to sell). The type of option affects the rights and obligations of the parties.



Settlement Terms

Derivative contracts can be settled in various ways, depending on the type of derivative and the preferences of the parties. Common settlement methods include physical delivery of the underlying asset, cash settlement (where the cash difference is exchanged), or netting.



Clearinghouse (For ExchangeTraded Derivatives)

In exchangetraded derivatives, a clearinghouse acts as an intermediary, guaranteeing the performance of the contract. It reduces counterparty risk by becoming the buyer to every seller and the seller to every buyer.



Factors Driving Growth of Derivatives Market

Risk Management Needs: Derivatives provide effective tools for hedging against various risks, attracting businesses and investors seeking risk mitigation.

Speculation and Investment Opportunities: Derivatives offer leverage for high-risk, high-reward opportunities, attracting speculative traders and investors.

Financialization: Derivatives play a central role in increasingly interconnected and sophisticated financial markets.

Diversification of Portfolios: Derivatives enable portfolio diversification across asset classes, appealing to institutional investors and portfolio managers.

Technological Advancements: Electronic trading platforms and technology have increased market efficiency and accessibility.

Globalization of Markets: Derivatives help manage risks associated with international trade and investments in a globalized financial landscape.

Innovations in Derivative Products: Continuous introduction of innovative products tailored to evolving market needs.

Interest Rate Environment: Interest rate derivatives are widely used to manage interest rate risk, and changes in interest rates drive demand for related derivatives.

Regulatory Developments: Regulations aimed at transparency and risk management contribute to the growth of derivatives, particularly through centralized clearing.

Macroeconomic Factors: Economic conditions, inflation, and geopolitical events impact the demand for derivatives as tools to navigate changing environments.

Types of Underlying Assets

Equities: Stocks and stock indices.

Fixed Income: Bonds and debt securities.

Currencies (Forex): Foreign exchange rates.

Commodities: Physical goods like gold, oil, and agricultural products.

Interest Rates: Linked to changes in interest rates.

Real Estate: Property values or real estate indices.

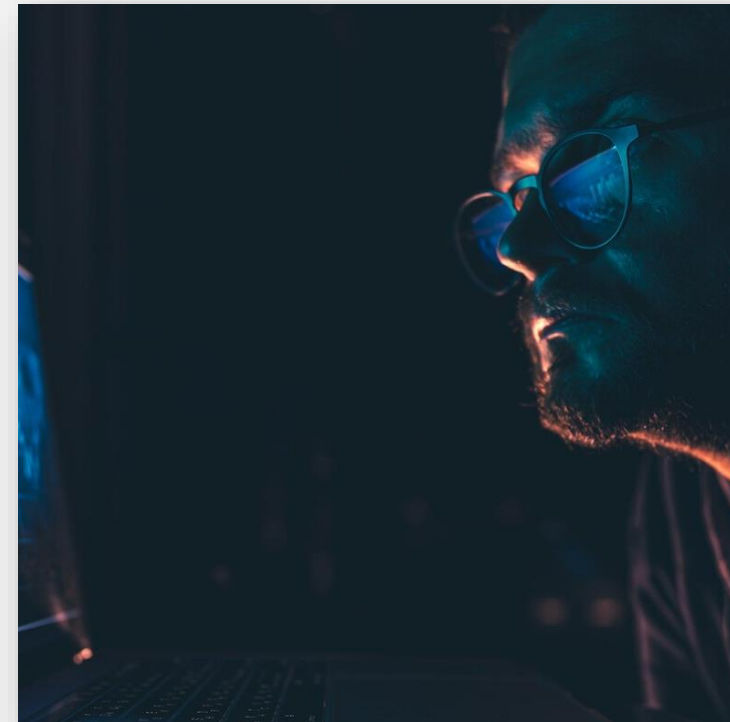
Cryptocurrencies: Digital assets like Bitcoin and Ethereum.

Credit Instruments: Linked to credit events or creditworthiness.

Volatility Indices: Measures of market volatility like the VIX.

Weather Derivatives: Linked to weather conditions.

InflationLinked Derivatives: Tied to inflation rates.



Participants in Derivatives Markets

Hedgers: Manage risk and protect against price fluctuations.

Speculators: Aim to profit from price movements.

Market Makers: Provide liquidity by quoting bid and ask prices.

Arbitrageurs: Exploit price discrepancies for risk free profits.

Institutional Investors: Use derivatives for hedging and portfolio management.

Retail Investors: Engage in derivatives trading for speculation or hedging.

Central Counterparties (CCPs): Clear and settle derivative trades, reducing counterparty risk.

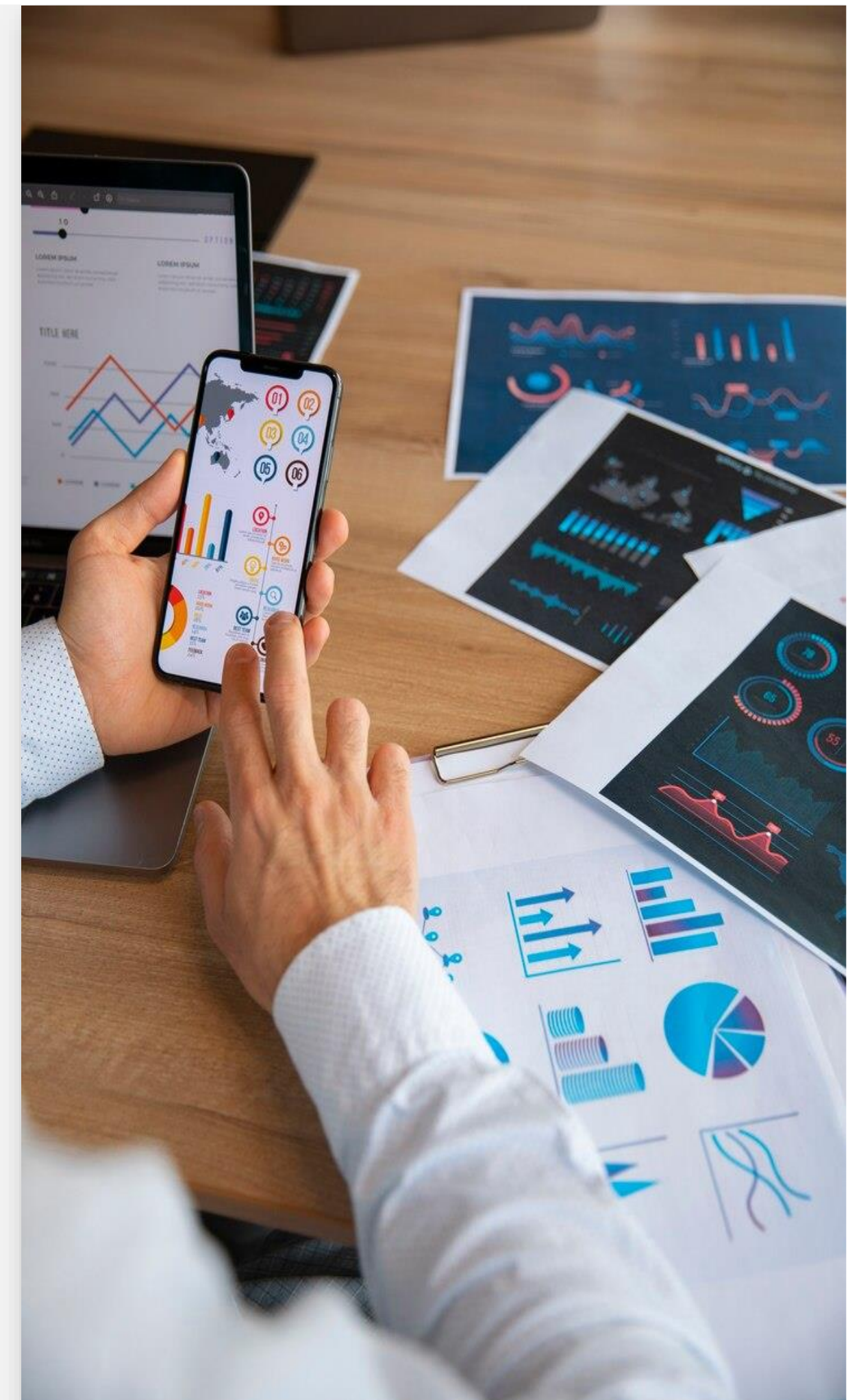
Brokers: Facilitate trading by connecting buyers and sellers.

Regulators: Oversee the market to ensure fairness and stability.

Clearinghouses: Guarantee the performance of contracts, reducing counterparty risk.

Corporate Treasurers: Use derivatives for risk management in corporate finance.

Government Entities: Engage in derivatives for risk management or policy objectives.



Advantages and Disadvantages of Trading in Derivatives Market

Advantages	Disadvantages
Effective risk management	Risk of excessive leverage
Leverage for larger positions	Complexity can lead to costly mistakes
Portfolio diversification	Counterparty risk
Speculation without asset ownership	Influence of market and economic factors
Contribution to price discovery	Regulatory impacts
Enhanced market efficiency	Margin call risk
	Potential for overtrading
	Risks due to limited understanding



Derivative Trade in India – A current scenario

Market Growth

India has a well-established derivatives market, with both equity and commodity derivatives traded on various exchanges. The National Stock Exchange (NSE) and Bombay Stock Exchange (BSE) are prominent for equity derivatives, while commodity derivatives are traded on exchanges like MCX and NCDEX.

Equity Derivatives

Equity derivatives, including futures and options, have been actively traded in India. The NSE Nifty 50 and NSE Bank Nifty are popular underlying indices for derivatives trading.

Commodity Derivatives

The commodity derivatives market in India has seen growth, driven by various commodities such as gold, silver, crude oil, and agricultural products. MCX is a leading exchange for commodity derivatives.

Regulatory Changes

The Securities and Exchange Board of India (SEBI) plays a crucial role in regulating the derivatives market. SEBI periodically introduces reforms and regulations to enhance market integrity, protect investors, and promote transparency.

Retail Participation

There has been an increasing trend in retail participation in the derivatives market, facilitated by online trading platforms. Retail investors often use derivatives for speculation and portfolio diversification.

Currency Derivatives

Currency derivatives, including futures and options on currency pairs, are actively traded. The Indian Rupee (INR) is a common underlying asset in currency derivatives.

Derivative Trade in India – A current scenario

Risk Management:

Market participants, including institutional investors and corporations, use derivatives for risk management. Hedging strategies are employed to mitigate exposure to market fluctuations.

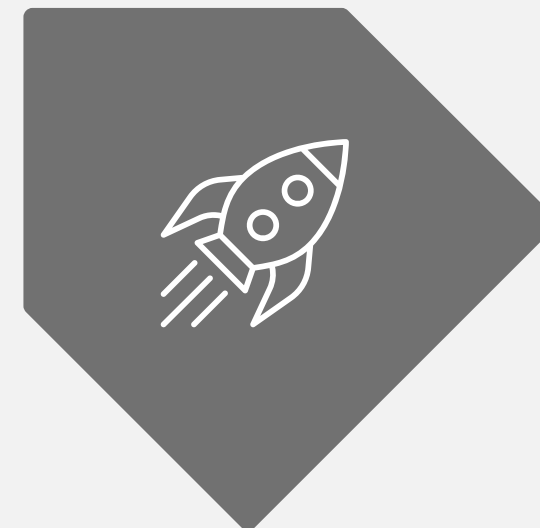


Technology Integration

The derivatives market in India has embraced technological advancements. Online trading platforms and mobile applications have made it easier for investors to access and trade derivatives.

Index Futures and Options

Index-based derivatives, particularly on benchmark indices like Nifty 50, are popular among traders and investors. These instruments provide exposure to the overall market movement.



Educational Initiatives

There has been an emphasis on investor education and awareness regarding derivatives. Exchanges and regulatory authorities have undertaken initiatives to educate investors about the risks and benefits of derivatives trading.

Thanks!