

A

LECTURE NOTE On

Security analysis & portfolio management

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MBA



By

Prof. Priyatama Panda

Security analysis and portfolio management

What is Investment?

An investment implies allocating money to assets such as real estate, gold, or the stock market to generate returns. This differs from merely saving money. While a savings account may offer a small percentage of interest, it does not yield significant future returns.

However, investing is done with the intent of generating substantial returns on investments over time. The investment definition involves putting your money to work.

Types of Investments

Here are the various types of investments based on every individual needs:

1. Savings Accounts

Savings accounts are one of the most common types of investment. They are low-risk ways to put money in a bank account while earning interest on it. **Banks generally offer 3% to 4% per annum interest based on the amount in your account.** This option is more suitable for beginners who have just started their investment journey and are looking to save money every month or a lump sum of money at once. However, they do not guarantee high returns over time.

2. Public Provident Fund (PPF)

PPF is another popular type of investment, and you can invest through your bank or post office. For 2024, PPF offers a **7.1%** interest on investment, which the Finance Ministry of India determines yearly. One important aspect of Public Provident Funds (PPF) is their lock-in period. You can invest a minimum of Rs. 500 and up to a maximum of Rs. 1.5 lakh annually. Additionally, investments in PPF are eligible for tax deductions under Section 80C of the Income Tax Act.

3. Fixed Deposit (FD)

Fixed Deposits (FDs) are among the most favoured traditional investments in India. You can deposit a fixed amount in your bank and receive guaranteed returns. FDs have a **lock-in period** ranging from 7 days to 10 years, offering a steady growth of your money over time with interest rates typically between 2.75% and 8.14% depending on various factors like maturity periods, FD amount and investor age.

4. Mutual Funds

Mutual funds have been one of the best investments in India over the years.. They are linked to the market conditions, and offer an average of 9% to 12% annual return on investments. There are several **types of mutual funds** to invest like equity, debt, or **hybrid funds**. There is also an option of a professional fund manager to help you manage your investments.

5. Unit Linked Insurance Plan (ULIP) -

ULIP combines the benefits of investment and insurance in one plan. They have a lock-in period of 5 years, during which you can invest money regularly for long-term investment. These are also eligible for tax deductions under section 80C of the Income Tax Act.

6. National Pension System (NPS)

The **National Pension System** (NPS) is a government-backed retirement savings scheme regulated by the Pension Fund Regulatory and Development Authority (**PFRDA**). It offers an attractive long-term savings avenue for **retirement**

planning. NPS contributions are invested in a mix of financial instruments, including government bonds, corporate bonds, and equities.

Upon retirement, 60% of the accumulated corpus can be withdrawn as a tax-free lump sum, while the remaining 40% is used to purchase an **annuity**, ensuring a steady income during retirement. Additionally, NPS provides tax benefits under Sections 80C and 80CCD of the Income Tax Act, making it a comprehensive and beneficial retirement planning option.

Objectives of Investment

Investing aims to achieve several objectives, such as:

- It helps grow your savings over time, providing a financial buffer for future needs like retirement or unexpected expenses.
- Some investments offer tax advantages, reducing your overall tax burden.
- Moreover, investing helps hedge against inflation, ensuring your money retains its purchasing power.

Diversifying your investments across various assets helps minimise the risk of significant losses. By understanding and pursuing these objectives, investors can build a solid financial foundation and work towards achieving their long-term financial goals.

Factors to Consider Before Investing

- **Financial Goals**

Set clear goals for why you are investing. Decide if your goals are short-term (like buying a car), medium-term (like saving for education), or long-term (like retirement). Knowing your goals helps you pick suitable investments.

- **Risk Tolerance**

Understand how much risk you can handle. If you can accept high risk for higher returns, consider stocks. If you prefer safety, look at bonds or fixed deposits. Knowing your risk level helps you avoid stress.

If you are looking for a low-risk investment option, NPS can be the best fit. The scheme offers a pension account (Tier I) and an additional investment account (Tier II) for greater flexibility. The Tier II account invests your contributions in Equity, Corporate Bonds, Government Securities, or Alternative Investment Funds (AIF).

- **Investment Horizon**

Determine how long you can stay invested. For long-term goals, you can take more risks with stocks. For short-term needs, choose a bit safer and liquid options. It ensures you have funds when you need them.

- **Costs and Fees**

Be mindful of the fees associated with investing, including brokerage fees and fund charges. Lower fees ensure that a greater portion of your investment remains invested and continues to grow over time.

2. Definition of 'Alternative Investment' An investment that is not one of the three traditional asset types (stocks, bonds and cash). Most alternative investment assets are held by institutional investors or accredited, high-net-worth individuals because of their complex nature, limited regulations and relative lack of liquidity. Alternative investments include hedge funds, managed futures, real estate, commodities and derivatives contracts

3. Investopedia Explains 'Alternative Investment' Many alternative investments also have high minimum investments and fee structures compared to mutual funds and ETFs. While they are subject to less regulation, they also have less opportunity to publish verifiable performance data and advertise to potential investors.

4. Alternative Investments Differ From Traditional Investments

1. Traditional Investments Relative performance objective* Generally no leverage Performance dependent primarily on market returns historically high correlation with market indices Typically offers daily liquidity Fixed management fee on assets under management

2. Alternative Investments Absolute performance objective* May use leverage Performance dependent primarily on advisor skill Historically low to moderate correlation with market indices Typically have reduced liquidity ranging from monthly to 12+ year lock-ups Generally higher fees which may include performance fees

5. Types of Investments We've already mentioned that there are many ways to invest your money. Of course, to decide which investment vehicles are suitable for you, you need to know their characteristics and why they may be suitable for a particular investing objective.

1. Private Equity The term private equity is used in the CAIA curriculum to include both equity and debt positions that, among other things, are not publicly traded. In most cases, the debt positions contain so much risk from cash flow uncertainty that their short-term return behavior is similar to that of equity positions. In other words, the value of the debt positions in a highly levered company, discussed within the category of private equity, behaves much like the equity positions in the same firm, especially in the short run.

2. Bonds Grouped under the general category called fixed-income securities, the term bond is commonly used to refer to any securities that are founded on debt. When you purchase a bond, you are lending out your money to a company or government. In return, they agree to give you interest on your money and eventually pay you back the amount you lent out.

3. Mutual funds A mutual fund is a collection of stocks and bonds. When you buy a mutual fund, you are pooling your money with a number of other investors, which enables you (as part of a group) to pay a professional manager to select specific securities for you. Mutual funds are all set up with a specific strategy in mind, and their distinct focus can be nearly anything: large stocks, small stocks, bonds from governments, bonds from companies, stocks and bonds, stocks in certain industries, stocks in certain countries, etc.

4. Real Assets The category of real assets focuses on investments in which the underlying assets involve direct ownership of nonfinancial assets rather than ownership through financial assets such as the securities of manufacturing or service enterprises. Real assets tend to represent more direct claims on consumption than common stocks, and they tend to do so with less reliance on factors that create value in a company, such as intangible assets and managerial skill.

5. Hedge Funds Hedge funds represent perhaps the most visible category of alternative investments. While hedge funds are often associated with particular fee structures or levels of risk taking, we define a hedge fund as a privately organized investment vehicle that uses its less regulated nature to generate investment opportunities that are substantially distinct from opportunities offered by traditional investment vehicles, which are subject to regulations such as those restricting their use of derivatives and leverage.

6. Commodities Commodities are investments distinguished by their emphasis on futures contracts, their emphasis on physical commodities, or both. Commodities are homogeneous goods available in large quantities, such as energy products, agricultural products, metals, and building materials. Futures contracts refer to traditional futures contracts, as well as closely related derivative products, such as forward contracts and swaps. Most of the investments covered in the commodities section of the CAIA curriculum involve futures contracts.

7. Alternative Investments: Options, Futures, FOREX, Gold, Real Estate, Etc. So, you now know about the two basic securities: equity and debt, better known as stocks and bonds.

6. Structures among Alternative Investments The previous sections defined the category of alternative investments by describing the investments that are or are not commonly thought of as alternative. But the question remains as to what the defining characteristics of investments are that cause them to be classified as alternative. Regulatory Securities structures Trading structures Compensation structures Institutional structures

7. Objective of alternative investment

1. To get a knowledge of the differences between alternative investments and traditional investments.
2. Demonstrate knowledge of how alternative and traditional investments are distinguished by return characteristics.

3. To know of the goals of alternative investing.

8. Goals of alternative investing

1. Active Management Active management is an important characteristic of almost all alternative investments. Unlike traditional investing, where the focus is often on security analysis and passive portfolio management,

in alternative investing the focus is often on analyzing the ability of the fund to generate attractive returns through active management.

2. Absolute and Relative Returns Earlier in this chapter, the concepts of benchmark returns, absolute return products, and investment diversifiers were briefly introduced. Let's examine those and other concepts in more detail. In alternative investing, there are two major standards against which to evaluate returns: absolute and relative.

3. Arbitrage, Return Enhancers, and Risk Diversifiers The concept of arbitrage is an active, absolute return strategy. Pure arbitrage is the attempt to earn risk-free profits through the simultaneous purchase and sale of identical positions trading at different prices in different markets. Modern finance often derives pricing relationships based on the idea that the actions of arbitrageurs will force the prices of identical assets toward being equal, such that pure arbitrage opportunities do not exist or at least do not persist. 9. Alternative Investing Benefits Returns independent of Stock Market Performance. Reduction of risk via portfolio diversification. Have performed well historically during market crises (Oct. 1987, Asian crisis 1998, 9/11 tragedy, current credit crisis 2007-2008). Low correlation to traditional investments such as stocks, real-estate, and bonds.

Stock Market Operations: Meaning, Function, Types & Participant

The stock market operations include buying, selling, and managing stocks, bonds, and other securities in the financial markets. Stock exchange operations facilitate the smooth flow of raising capital for companies and trading shares by investors. This article explores what stock market operations are, their functions, types, and key participants in the market. By learning about its functions, types, and participants, you can make informed decisions and participate confidently in the financial markets.

What is Stock Market Operations?

Stock market operations represent all the activities and processes occurring within the stock market, including listing companies' [shares](#) and their actual buying and selling by investors. These procedures incorporate regulation, trading, settlement, and monitoring of transactions to preserve fairness and transparency in financial markets.

Functions of the Stock Market

The [stock market](#) represents a core function of the economy since it enables companies to source capital and allow the investor to accumulate wealth. There are many core functions that the stock market has as is listed below.

1. **Capital Formation:** The stock market helps firms raise capital by issuing shares to the public. Such capital is deployed for business expansion, research, and development. Example: While Zomato went for an IPO, it raised capital from public investors to fund its growth.
2. **Allows Trading of Securities:** It enables the purchase and sale of shares, [bonds](#), derivatives, and so forth. Thus, with the right market conditions, an investor can buy Tata Motors' shares today and sell them the next day.
3. **Mechanism of price discovery:** The stock market determines the price of security securities. For example, if more people want to buy Infosys shares, the price will rise due to high demand.
4. **Liquidity provision:** Investors may liquidate investments into cash since shares can easily be sold within the stock market. For instance, if money is urgently required, shares are sold instantly for cash.

Types of Stock Market

There are different types of stock markets, depending on the nature of trading and the types of securities. This helps the investor make an informed decision.

Primary Market

The [primary market](#) allows companies to initiate floatation and issue new securities to the actual investors. Process The process here is an Initial Public Offering, abbreviated as IPO. In the primary market, business organizations issue newly floated capital meant to fund different business activities, such as its expansion plan, from new capitalists. In these, direct dealings take place through which investors gain direct purchase.

Companies can fix the price of their securities in the primary market either at a fixed rate or through book-building, where [demand](#) helps decide the price. For example, when Paytm recently launched its IPO, it sold new shares to the public to raise funds and allowed investors to become part of the company by purchasing those shares.

- **Advantages of Primary Market:** It provides the business with capital for expansion. It offers early investment opportunities. It helps companies improve their public profile.
- **Disadvantages:** New companies have limited information. High-risk investments due to uncertainty.

Secondary Market

It is the [secondary market](#) in which investors sell and purchase securities. The company issuing the original shares is not involved in the transaction. This type of market allows people to trade stocks that have already issued bonds, among others, and investors can earn from price changes.

Prices in the secondary market continue to change due to changes in demand and supply. When more individuals wish to buy a stock, its price rises; when more individuals wish to sell, its price falls. The Bombay Stock Exchange (BSE) and the National [Stock Exchange](#) (NSE) are popular stock exchanges. For example, purchasing HDFC Bank shares from another investor on the NSE is a secondary market trade.

- **Advantages of Secondary Market:** High liquidity is enjoyed by the investors. Pricing is transparent based on real-time demand. Easy entry and exit for investors.
- **Disadvantages:** Highly volatile and prone to market risks. It can be speculated on.

Participants in Stock Market Operations

There are various stock market participants each of whom play a critical role in making the trading activities operate smoothly and effectively.

1. **Retail Investors:** Retail investors are regular people like us who invest and sell equity shares for their private [investment](#) purposes. They sustain the market liquidity by doing constant trading. For example, the Student invested ₹5,000 in Infosys shares, a retail investment.
2. **Institutional Investors:** Large organizations such as mutual funds, [insurance companies](#), and pension funds. They invest large amounts of money that could influence market trends. Example: LIC (Life Insurance Corporation of India) investing in top companies' stocks.
3. **Stock Brokers:** A stock broker is a professional or firm that helps buy and sell shares to an investor. He is the contact between the investor and the stock market. For example, Zerodha and Upstox are some popular stock brokers in India.
4. **Market Makers:** Market makers are the firms or institutions that keep the market alive. They do so by always being ready to buy or sell shares, thus controlling the price change. Example: The big financial houses like JP Morgan act as market makers.
5. **Regulators:** The government agencies responsible for the stock market's regulations. These entities ensure everything goes smoothly and is fair, transparent, and safe for investors. For instance, The primary regulatory authority in India is [SEBI](#) or the Securities and Exchange Board of India.

Understanding investment risks and returns

Every investment avenue must be selected only after a careful evaluation of the potential returns and the associated risks. In order to evaluate both, it is important to understand them.

What is the risk of investing?

As a general concept, the risk of any investment refers to the uncertainty associated with the expected returns. If the expected returns are guaranteed, there is no risk. For example, when an Indian investor invests in securities issued by the Government of India and holds the same till maturity, one is assured of getting the promised returns. This investment is considered to be risk-free.

One may look at the risk from another angle. People invest their money to achieve financial goals. The risk they face is not having enough money at the required time, i.e., the time of the goal.

There are various factors affecting this risk. Primary among these are:

•**Volatility of returns due to price fluctuation:**

Prices of various securities fluctuate in the markets based on the opinions and actions of various buyers and sellers. The prices also fluctuate due to changes in the company, industry, or economy.

When a short-term investor buys and sells securities, the price fluctuation can either result in a profit or a loss if the investor is able to make the right call. Or sometimes the same trade can result in a large loss if the investor's judgement about price movement goes wrong.

For a long-term investor, the risk is reduced to some extent.

The assets that exhibit higher volatility in the short term often have the potential to deliver high returns. At the same time, assets that are less volatile or not volatile at all offer poor returns.

Volatility can be divided into two categories: security-specific and market-wide. The former can be reduced through diversification, whereas the latter cannot.

•**Credit risk:**

This risk refers to a borrower's inability to repay the borrowed amount as per the agreed schedule.

This should include both a total default as well as a delay in any payment.

The measure of credit risk is the credit rating, and the compensation for taking credit risk comes from a higher expected return, often referred to as the credit spread.

•**Risk of illiquidity**

The inability of an investor to sell the investments and convert them into cash could be due to various factors, primary among which is the inherent illiquidity associated with the investment.

There are some assets and markets that have an inherent risk of illiquidity, while in certain cases, there are operational reasons. For example, the real estate market is inherently less liquid in that selling a property takes time, and there are phases in the market when the time taken could be years. At the same time, some mutual fund schemes may be highly liquid but may have a lock-in period for a certain duration.

•**Inflation:**

Prices of items of consumption keep moving up over the years; this phenomenon is known as inflation, also called price inflation. Rising prices also mean a reduction in the purchasing power of the rupee. (Read the article Understanding Inflation.) It impacts the well-being of a person when the investment returns are lower than inflation.

Assets that do not take any of the above-mentioned risks often deliver lower returns than inflation, whereas in order to beat inflation, one must take at least one of the three risks, viz., price volatility, credit risk, or illiquidity.

Portfolio analysis is the process of reviewing a collection of investments, products, or projects to assess performance, balance risk and return, and optimize resource allocation. In finance, this involves analyzing assets like stocks and bonds to understand risk and return and make adjustments to the portfolio. In business, it's used to evaluate a company's product lines or strategic initiatives to make decisions about where to invest, grow, or divest.

Key aspects of portfolio analysis

Financial investments:

Purpose: To measure a portfolio's overall performance, risk, and return, often against a benchmark.

Tools: Common metrics include Holding Period Return, Arithmetic Mean, and the Sharpe Ratio.

Goals: To ensure assets are properly allocated to meet investment goals and to identify which investments are performing well or poorly.

Business strategy:

Purpose: To evaluate a company's various product lines, services, or projects to ensure resources are aligned with strategic goals.

Tools: Frameworks like the BCG Matrix or GE-McKinsey Matrix (not explicitly mentioned but implied) can be used to categorize products based on market share and growth potential.

Goals: To decide whether to invest more in high-growth areas, maintain steady performers, or exit underperforming markets.

Risk in a portfolio is the uncertainty of achieving expected returns and the possibility of losing money, while return is the gain generated from the investment. Generally, higher potential returns are associated with higher risk, and the goal is to balance these based on an investor's financial goals and time horizon. Risk can be measured by the volatility of returns and includes both market-wide (systematic) and company-specific (unsystematic) risks that can be managed through diversification.

Risk

Definition: The probability that an investment will underperform or result in a loss of part or all of the initial investment.

Measurement: Often measured by volatility, or standard deviation, which indicates how much the returns might deviate from the average.

Types:

Systematic (market) risk: Affects the entire market and cannot be diversified away. Examples include changes in interest rates, inflation, or geopolitical events.

Unsystematic (company-specific) risk: Affects a specific company or industry and can be reduced through diversification. Examples include a labor strike or a change in a company's management.

Return: The reward for taking on risk, measured as the gain or loss on an investment over a period.

It can come from capital gains (selling an investment for more than the purchase price), dividends, or interest.

To compare returns, calculate the "percent return" by dividing the total return by the initial investment.

The risk-return trade-off

The basic relationship: Higher risk investments have the potential for higher returns, but they also have a greater chance of significant loss. Conversely, lower risk investments typically offer lower, more predictable returns.

Diversification: A key strategy in portfolio management is to diversify by investing in different industries or markets. Because different sectors fluctuate at different times, diversification can help manage overall risk.

Markowitz's Portfolio Theory

1.1 Introduction A little over forty years ago, a University of Chicago graduate student in economics, while in search of a dissertation topic, ran into a stockbroker who suggested that he study the stock market. Harry Markowitz took that advice and developed a theory that became a foundation of financial economics and revolutionized investment practice. His work earned him a share of 1990 Nobel Prize in Economics. A basic premise of economics is that, due to the scarcity of resources, all economic decisions are made in the face of tradeoffs. Markowitz identified the trade-off facing the investor: risk versus expected return. The investment decision is not merely which securities to own, but how to divide the investor's wealth amongst securities. This is the problem of "Portfolio Selection," hence the title of Markowitz's seminal article published in the March 1952 issue of the *Journal of Finance*. In that article and subsequent works, Markowitz extends the techniques of linear programming to develop the critical line algorithm. The critical line algorithm identifies all feasible portfolios that minimize risk (as measured by variance or standard deviation) for a given level of expected return and maximize expected return for a given level of risk. When graphed in standard deviation versus expected return space, these portfolios form the efficient frontier. The efficient frontier represents the trade-off between risk and expected return faced by an investor when forming his portfolio. Most of the efficient frontier represents well diversified portfolios. This is because diversification is a powerful means of

1.2 Assumptions

As with any model, it is important to understand the assumptions of mean-variance analysis in order to use it effectively. First of all, mean-variance analysis is based on a single period model

of investment. At the beginning of the period, the investor allocates his wealth among various asset classes, assigning a nonnegative weight to each asset. 3 During the period, each asset generates a random rate of return so that at the end of the period, his wealth has been changed by the weighted average of the returns. In selecting asset weights, the investor faces a set of linear constraints, one of which is that the weights must sum to one. Based on the game theory work of Von Neumann and Morgenstern, economic theory postulates that individuals make decisions under uncertainty by maximizing the expected value of an increasing concave utility function of consumption. In a one period model, consumption is end of period wealth. In general, maximizing expected utility of ending period wealth by choosing portfolio weights is a complicated stochastic nonlinear programming problem. To summarize the assumptions: 1. Investors seek to maximize the expected return of total wealth. 2. All investors have the same expected single period investment horizon. 3. All investors are risk-averse, that is they will only accept greater risk if they are compensated with a higher expected return. 4. Investors base their investment decisions on the expected return and risk. 5. All markets are perfectly efficient (e.g. no taxes and no transaction costs). The utility function is assumed to be increasing and concave. In terms of the approximating utility function, this translates into expected utility being increasing in expected return (more is better than less) and decreasing in variance (the less risk the 4 better). Hence, of all feasible portfolios, the investor should only consider those that maximize expected return for a given level of variance, or minimize variance for a given level of expected return. These portfolios form the mean-variance efficient set.

1.2 Optimal Portfolio Selection Model Assuming the portfolio has N assets with returns R_i , $i=1..N$. Let, R_p = Return on the portfolio R_i = Return on asset i w_i = Weight of component asset i (that is, the share of asset i in the portfolio). σ_i = Standard deviation of asset i Portfolio return: $R_p = \sum w_i E(R_i)$ Portfolio return variance: where ρ_{ij} is the correlation coefficient between the returns on assets i and j

The feasible set of portfolios, also known as the portfolio opportunity set, is the collection of all possible portfolios an investor can construct from a given set of assets. It represents every combination of assets and their respective weights that can be created, subject to constraints like available capital and asset availability. Each point on a risk-return graph corresponds to a specific portfolio within this set, which is defined by a unique expected return and risk level.

Definition: The feasible set includes every possible portfolio combination, each defined by a specific combination of asset weights.

Constraints: Its boundaries are determined by factors such as the specific assets available, the total investment capital, and any investor-specific limitations.

Visualization: Graphically, the feasible set appears as a region in a risk-return plane, with each point representing a possible portfolio.

Distinction from efficient frontier: The feasible set contains all possible portfolios, while the efficient frontier is a subset of the feasible set consisting only of the optimal portfolios that offer the highest expected return for a given level of risk

Efficient set selection involves identifying the efficient frontier, a curve of portfolios that offer the highest expected return for a given level of risk, or the lowest risk for a given return. An investor then chooses the

optimal portfolio from this set based on their individual risk tolerance, which is the portfolio that is tangent to the investor's highest indifference curve.

The process of efficient set selection

Define the feasible set: This includes all possible portfolios that can be created from a given set of securities.

Determine the efficient set (Efficient Frontier):

An efficient portfolio is one that offers the maximum return for a given risk or minimum risk for a given return.

By combining assets, you can construct a set of efficient portfolios, which forms a curve on a risk-return graph, known as the efficient frontier.

The efficient frontier represents the boundary of optimal portfolios; any portfolio below it is inefficient because it offers less return for the same risk.

Select the optimal portfolio:

Each investor has a different level of risk aversion, which can be represented by indifference curves.

An indifference curve shows all the different risk-return combinations that provide the same level of satisfaction to an investor.

The investor's optimal portfolio is the one on the efficient frontier that touches their highest possible indifference curve.

A highly risk-averse investor will choose a portfolio lower on the frontier (lower risk), while a less risk-averse investor will choose one higher up (higher risk).

Key concepts

Risk: For a portfolio, risk is often measured by the standard deviation of its returns.

Covariance: This measures how the returns of two assets move in relation to each other, and is a key component in calculating portfolio risk.

Quadratic programming: This is a mathematical technique used to solve the complex problem of identifying the composition of each portfolio on the efficient frontier, especially when dealing with a large number of assets.

What Is A Single Index Model?

The Single Index Model (SIM) is a financial model that investors use to analyze the risk and return characteristics of individual securities in a portfolio. It aims to measure a stock's risk and return. With this model, investors can assess the risk and return trade-offs of individual securities concerning the overall market.

. Single Index Model Explained

The Single Index Model is a model in [technical analysis](#) that helps traders estimate a security's [risk and return](#). It aids in assessing the risk and return characteristics of individual securities within a portfolio. It relies on the idea that a security's performance has a correlation with the market index's performance. In short, the SIM considers a security's return based on systematic and [unsystematic risks](#).

In SIM, the relationship between a security's return and the return of the market index is established with a linear equation. The equation records the security's [systematic risk](#) by multiplying the market return with a [beta coefficient](#) specific to that security. The beta coefficient measures the sensitivity of the security's returns to the overall

market returns. A security with a beta greater than one has higher [volatility](#) than the market, whereas a beta less than one indicates lower volatility.

This model lets investors make informed trading decisions regarding portfolio allocation and [risk management](#). Therefore, it is commonly applicable in asset pricing, portfolio management, and [risk analysis](#). It offers a structure for understanding the relationship between individual securities and the market. Moreover, it enables investors to evaluate their portfolios' risk and return characteristics effectively.

Assumptions

The assumptions of the single index model are:

#1 - Linear Relationship

It assumes a [linear relationship](#) between the return from an individual security and the return from a market index. It means that the security's return can be represented as a linear function of the market return.

#2 - Systematic And Unsystematic Risk

It is based on the assumption that the return from security comprises two components: systematic risk and unsystematic risk.

#3 - Homogeneous Expectations

It surmises that all the investors have the same expectations about the securities' future returns and risks. Thus, it considers that investors make investment decisions based only on the [risk return trade off](#) of the securities.

#4 - Constant Beta

The SIM assumes that the beta coefficient, which measures the sensitivity of a security's returns to the market returns, remains constant over time. Thus, it implies that the relationship between the security and the market index is stable.

#5 - No Transaction Costs Or Taxes

This model considers that there are no [transaction costs](#), taxes, or other frictions associated with buying or selling securities. It assumes that investors can freely trade securities at no charge.

Formula

The single index model formula is as follows:

Single Index Model Formula

$$R_i = \alpha_i + \beta_i R_m + \epsilon_i$$

where:

- R_i = the expected return of security i
- α_i = the intercept of the regression line for security i
- β_i = the sensitivity (beta) of security i to the market index
- R_m = the expected return of the market index
- ϵ_i = the error term or residual, which represents random factors that affect the return of security i that are not explained by the market index.

Advantages And Disadvantages

The advantages of the single index model are:

- The Single Index Model facilitates the evaluation of the risk-return trade-off from individual securities. Investors can assess whether security offers an adequate return given its level of risk by analyzing the

relationship between a security's return and its systematic risk. This information is valuable for making informed investment decisions and constructing well-balanced portfolios.

- This model helps diversify the portfolio by distinguishing between systematic and unsystematic risk. Since the model assumes that unsystematic risk can be diversified away, investors can focus on managing and minimizing the systematic risk in their portfolios. Investors can achieve a diversified portfolio that reduces unsystematic risk by combining securities with low correlations to the market.
- It provides a benchmark for evaluating the performance of individual securities. Investors can assess whether the security is over or underperforming related to its systematic risk exposure by comparing the actual returns from the security with its predicted returns based on the model.

The disadvantages of the single index model are:

- The Single Index Model focuses primarily on the relationship between a security and a [single market](#) index. It does not consider other factors impacting a security's performance, like [interest rates](#) or [macroeconomic](#) conditions. Neglecting these factors can result in an inaccurate or incomplete risk and return analysis.
- The model is designed to analyze securities closely related to a market index. It may not be suitable for evaluating or comparing securities that do not correlate strongly with a specific market index.
- It relies on historical data to estimate betas and make predictions. As a result, it may not accurately capture future [market dynamics](#), especially during market instability or structural changes. The model's effectiveness is limited to the reliability and relevance of historical data.

Single Index Model vs CAPM

The differences are as follows:

- **Single Index Model:** The Single Index Model is more straightforward than the [CAPM](#) (Capital Asset Pricing Model). It assumes a linear relationship between a security's return and the return from a market index, which is easier to understand and implement. It focuses on the specific relationship between security and the market index, allowing investors to evaluate the security's systematic risk and its performance related to the market. The Single Index Model provides a framework for assessing the risk-return trade-off from individual securities within a portfolio, aiding investors in making informed decisions about [portfolio construction](#) and diversification. However, the Single Index Model has limitations, including its linear and constant beta assumptions, which may not accurately capture the market relationship complexities and security performance.
- **CAPM:** The [CAPM](#) is a more comprehensive model than the Single Index Model. It considers the relationship between security and the market index, as well as the [risk-free rate](#) and the overall market risk. It provides a systematic way to estimate the expected return from an individual security based on its beta, the risk-free rate, and the [market risk premium](#). This model includes systematic and unsystematic risk in its analysis, offering a more integrated assessment of a security's risk and return characteristics. It is commonly applicable in asset pricing and portfolio management. The model provides a benchmark for evaluating the performance of securities and constructing efficient portfolios. However, the CAPM relies on certain assumptions, like efficient markets and linear relationships, which may not always hold in real-life situations.
- With risk-free lending and borrowing, the efficient frontier becomes a straight line, called the Capital Allocation Line (CAL). This line is formed by connecting the risk-free rate to the tangent portfolio on the original curved efficient frontier of risky assets. The tangent portfolio is the most efficient

combination of risky assets, providing the highest return for its level of risk, and it represents the optimal risky portfolio that all investors should hold in some proportion.

- How it works
- The tangent portfolio: A new line is drawn from the risk-free rate (on the y-axis) to a portfolio of risky assets. The efficient frontier of only risky assets is a curve, so this line is drawn to be tangent to the curve. This point of tangency is the optimal risky portfolio, as it has the highest possible Sharpe ratio (return per unit of risk).
- Risk-free lending: Investors can combine the tangent portfolio with risk-free lending (e.g., buying government bonds) to create portfolios that are more efficient than any portfolio of only risky assets. By lending at the risk-free rate, they can achieve a lower-risk portfolio with a lower return.
- Risk-free borrowing: Investors can also borrow at the risk-free rate to invest more in the tangent portfolio. This allows them to achieve higher returns than the tangent portfolio alone, but with increased risk. This is sometimes called leverage.
- New efficient frontier: The new efficient frontier is the straight Capital Allocation Line itself, not the original curve. This straight line represents all possible combinations of the risk-free asset and the tangent portfolio. Any point on this line is achievable and represents the highest possible expected return for a given level of risk.
- Key assumptions
- Risk-free asset: It is assumed that a risk-free asset exists (like a government bond) and that investors can lend and borrow unlimited amounts of money at the same risk-free interest rate.
- Rational investors: All investors are assumed to be rational and to make decisions based on risk and return, meaning they will always choose a portfolio on the Capital Allocation Line.
- Market portfolio: In a perfectly efficient market, all investors will hold the same optimal portfolio of risky assets (the tangent portfolio), but they will combine it with different amounts of the risk-free asset based on their individual risk tolerance.

What Is the Capital Asset Pricing Model (CAPM)?

The capital asset pricing model (CAPM) describes the relationship between [systematic risk](#), or the general perils of investing, and [expected return](#) for assets, particularly stocks. It is a finance model that establishes a linear relationship between the required return on an investment and risk.

CAPM is based on the relationship between an asset's [beta](#), the [risk-free rate](#) (typically the [Treasury bill](#) rate), and the [equity risk premium](#), or the expected return on the market minus the risk-free rate.

CAPM evolved as a way to measure this systematic risk. It is widely used throughout finance for pricing risky [securities](#) and generating expected returns for assets, given the risk of those assets and [cost of capital](#).

Capital Asset Pricing Model (CAPM) Formula

The formula for calculating the expected return of an [asset](#), given its [risk](#), is as follows:

$ER_i = R_f + \beta_i(ER_m - R_f)$ where: ER_i = expected return of investment R_f = risk-free rate β_i = beta of the investment $(ER_m - R_f)$ = market risk premium
 $ER_i = R_f + \beta_i(ER_m - R_f)$ **where:** ER_i = expected return of investment R_f = risk-free rate β_i = beta of the investment $(ER_m - R_f)$ = market risk premium

Investors expect to be compensated for risk and the [time value of money](#). The risk-free rate in the CAPM formula accounts for the time value of money. The other components of the CAPM formula account for the [investor](#) taking on additional risk.

The [goal of the CAPM formula](#) is to evaluate whether a stock is fairly valued when its risk and the time value of money are compared with its expected return. In other words, by knowing the individual parts of the CAPM, it is possible to gauge whether the [current price](#) of a stock is consistent with its likely return.

IMPORTANT

CAPM and Beta

Beta compares a security or portfolio's volatility or systematic risk to the market. If a [stock](#) is riskier than the market, it will have a beta greater than one. If a stock has a beta of less than one, the formula assumes it will reduce the risk of a [portfolio](#).

A stock's beta is then multiplied by the [market risk premium](#), which is the return expected from the market above the risk-free rate. The [risk-free rate](#) is then added to the product of the stock's beta and the market risk premium. The result should give an investor the [required return](#) or [discount rate](#) that they can use to find the value of an asset.

CAPM Example

Imagine an investor is contemplating a stock valued at \$100 per [share](#) today that pays a 3% annual [dividend](#). Say this stock has a beta compared with the market of 1.3, which means it is more volatile than a broad market portfolio (i.e., the S&P 500 Index). Also, assume that the risk-free rate is 3% and this investor expects the market to rise in value by 8% per year.

The expected return of the stock based on the CAPM formula is 9.5%:

$$9.5\% = 3\% + 1.3 \times (8\% - 3\%) \quad 9.5\% = 3\% + 1.3 \times (8\% - 3\%)$$

The expected return of the CAPM formula is used to discount the expected dividends and [capital appreciation](#) of the stock over the expected holding period. If the discounted value of those future cash flows is equal to \$100, then the CAPM formula indicates the stock is fairly valued relative to risk.

Problems With the CAPM

Unrealistic Assumptions

Several assumptions behind the CAPM formula have been shown not to hold up in reality. Modern financial theory rests on two assumptions:

1. Securities markets are very competitive and efficient (that is, relevant information about the companies is quickly and universally distributed and absorbed).
2. These markets are dominated by rational, risk-averse investors, who seek to maximize satisfaction from [returns on their investments](#).

As a result, it's not entirely clear whether CAPM works. The big sticking point is beta. When professors Eugene Fama and Kenneth French looked at share returns on the [New York Stock Exchange \(NYSE\)](#), the [American Stock Exchange \(AMEX\)](#), and [Nasdaq](#), they found that differences in betas over a lengthy period did not explain the performance of different stocks. The linear relationship between beta and individual stock returns also breaks down over shorter periods of time. These findings seem to suggest that CAPM may be wrong.²

Including beta in the formula assumes that risk can be measured by a stock's price [volatility](#). However, price movements in both directions are not equally risky. The look-back period to determine a stock's volatility is not standard because stock returns (and risk) are not [normally distributed](#).

The CAPM also assumes that the risk-free rate will remain constant over the discounting period. Assume in the previous example that the interest rate on U.S. Treasury bonds rose to 5% or 6% during the 10-year holding period. An increase in the risk-free rate also increases the cost of the capital used in the investment and could make the stock look [overvalued](#).

The CAPM and the Efficient Frontier

Using the CAPM to build a portfolio is supposed to help an investor manage their risk. If an investor were able to use the CAPM to perfectly optimize a portfolio's return relative to risk, it would exist on a curve called the [efficient frontier](#), as shown in the following graph.

Image by Julie Bang © Investopedia 2022

The graph shows how greater expected returns (y axis) require greater expected risk (x axis). [Modern portfolio theory \(MPT\)](#) suggests that starting with the risk-free rate, the expected return of a portfolio increases as the risk increases. Any portfolio that fits on the [capital market line \(CML\)](#) is better than any possible portfolio to the right of that line, but, at some point, a theoretical portfolio can be constructed on the CML with the best return for the amount of risk being taken.

The CML and the efficient frontier may be difficult to define, but they illustrate an important concept for investors: There is a tradeoff between increased return and increased risk. Because it isn't possible to perfectly build a portfolio that fits on the CML, it is more common for investors to take on too much risk as they seek additional return.

In the following chart, you can see two portfolios that have been constructed to fit along the efficient frontier. Portfolio A is expected to return 8% per year and has a 10% [standard deviation](#) or risk level. Portfolio B is expected to return 10% per year but has a 16% standard deviation. The risk of Portfolio B rose faster than its expected returns.

What is the Arbitrage Pricing Theory?

The Arbitrage Pricing Theory (APT) is a theory of asset pricing that holds that an asset's [returns](#) can be forecasted with the linear relationship of an asset's expected returns and the [macroeconomic factors](#) that affect the asset's risk. The theory was created in 1976 by American economist, Stephen Ross. The APT offers analysts and investors a multi-factor pricing model for securities, based on the relationship between a financial asset's expected return and its risks.

The APT aims to pinpoint the fair market price of a security that may be temporarily incorrectly priced. It assumes that market action is less than always perfectly efficient, and therefore occasionally results in assets being mispriced – either overvalued or undervalued – for a brief period of time.

However, market action should eventually correct the situation, moving price back to its fair market value. To an arbitrageur, temporarily mispriced securities represent a short-term opportunity to profit virtually risk-free.

The APT is a more flexible and complex alternative to the [Capital Asset Pricing Model \(CAPM\)](#). The theory provides investors and analysts with the opportunity to customize their research. However, it is more difficult to apply, as it takes a considerable amount of time to determine all the various factors that may influence the price of an asset.

Assumptions in the Arbitrage Pricing Theory

The Arbitrage Pricing Theory operates with a pricing model that factors in many sources of risk and uncertainty. Unlike the Capital Asset Pricing Model (CAPM), which only takes into account the single factor of the risk level of the overall market, the APT model looks at several macroeconomic factors that, according to the theory, determine the risk and return of the specific asset.

These factors provide risk premiums for investors to consider because the factors carry [systematic risk](#) that cannot be eliminated by diversifying.

The APT suggests that investors will diversify their portfolios, but that they will also choose their own individual profile of risk and returns based on the premiums and sensitivity of the macroeconomic risk factors. Risk-taking investors will exploit the differences in expected and real returns on the asset by using arbitrage.

Arbitrage in the APT

The APT suggests that the returns on assets follow a linear pattern. An investor can leverage deviations in returns from the linear pattern using the arbitrage strategy. Arbitrage is the practice of the simultaneous purchase and sale of an asset on different exchanges, taking advantage of slight pricing discrepancies to lock in a risk-free profit for the trade.

However, the APT's concept of arbitrage is different from the classic meaning of the term. In the APT, arbitrage is not a risk-free operation – but it does offer a high probability of success. What the arbitrage pricing theory offers traders is a model for determining the theoretical fair market value of an asset. Having determined that value, traders then look for slight deviations from the fair market price, and trade accordingly.

For example, if the fair market value of stock A is determined, using the APT pricing model, to be \$13, but the market price briefly drops to \$11, then a trader would buy the stock, based on the belief that further market price action will quickly “correct” the market price back to the \$13 a share level.

Mathematical Model of the APT

The Arbitrage Pricing Theory can be expressed as a mathematical model:

$$ER(x) = R_f + \beta_1 RP_1 + \beta_2 RP_2 + \dots + \beta_n RP_n$$

Where:

- **$ER(x)$** – Expected return on asset
- **R_f** – Riskless rate of return
- **β_n (Beta)** – The asset's price sensitivity to factor
- **RP_n** – The risk premium associated with factor

Historical returns on securities are analyzed with [linear regression analysis](#) against the macroeconomic factor to estimate beta coefficients for the arbitrage pricing theory formula.

Inputs in the Arbitrage Pricing Theory Formula

The Arbitrage Pricing Theory provides more flexibility than the CAPM; however, the former is more complex. The inputs that make the arbitrage pricing model complicated are the asset's price sensitivity to factor n (β_n) and the risk premium to factor n (RP_n).

Before coming up with a beta and risk premium, the investor must select the factors that they believe affect the return on the asset; it can be done through fundamental analysis and a multivariate regression. One method to calculate the beta of the factor is by analyzing how that beta's affected many similar assets/indices and obtain an estimate by running a regression on how the factor's affected the similar assets/index.

The risk premium can be obtained by equating the similar assets'/indices' historical annualized return to the riskless rate, added to the betas of the factors multiplied by the factor premiums, and solve for the factor premiums.

Example

Assume that:

- You want to apply the arbitrage pricing theory formula for a well-diversified portfolio of equities.
- The riskless rate of return is 2%.
- Two similar assets/indices are the S&P 500 and the Dow Jones Industrial Average (DJIA).
- Two factors are inflation and gross domestic product (GDP).
- The betas of inflation and GDP on the S&P 500 are 0.5 and 3.3, respectively*.
- The betas of inflation and GDP on the DJIA are 1 and 4.5, respectively*.
- The S&P 500 expected return is 10%, and the DJIA expected return is 8%*.

*Betas do not represent actual betas in the markets. They are only used for demonstrative purposes.

*Expected returns do not represent actual expected returns. They are only used for demonstrative purposes.

After solving for the risk premiums, we are left with the following for our well-diversified portfolio:

$$\text{S\&P 500: } ER(\text{S\&P 500}) = R_f + \beta_1 RP_1 + \beta_2 RP_2$$

$$\text{S\&P 500: } 10\% = 2\% + 0.5RP_1 + 3.3RP_2$$

$$\text{DJIA: } ER(\text{DJIA}) = R_f + \beta_1 RP_1 + \beta_2 RP_2$$

$$\text{DJIA: } 8\% = 2\% + 1RP_1 + 4.5RP_2$$

$$RP_1 = -0.154285 \quad RP_2 = 0.0476189$$

To calculate the expected arbitrage pricing theory return, plug in the regression results of how the betas have affected many similar assets/indices.

$$ER(x) = R_f + \beta_1 RP_1 + \beta_2 RP_2$$

$$ER(x) = 2\% + \beta_1(-0.154285) + \beta_2(0.047$$

Image by Julie Bang © Investopedia 2022

CAPM and the Security Market Line (SML)

The efficient frontier assumes the same things as the CAPM and can only be calculated in theory. If a portfolio existed on the efficient frontier, it would provide maximal return for its level of risk. However, it is impossible to know whether a portfolio exists on the efficient frontier because future returns cannot be predicted.

This tradeoff between risk and return applies to the CAPM, and the efficient frontier graph can be rearranged to illustrate the tradeoff for individual assets. In the following chart, you can see that the CML is now called the [security market line \(SML\)](#). Instead of expected risk on the x axis, the stock's beta is used. As you can see in the illustration, as beta increases from 1 to 2, the expected return is also rising.

Image by Julie Bang © Investopedia 2022

The CAPM and the SML make a connection between a stock's beta and its expected risk. Beta is found by statistical analysis of individual, daily share price returns compared with the market's daily returns over precisely the same period. A higher beta means more risk, but a portfolio of high-beta stocks could exist somewhere on the CML where the tradeoff is acceptable, if not the theoretical ideal.

The value of these two models is diminished by assumptions about beta and market participants that aren't true in the real markets. For example, beta does not account for the relative riskiness of a stock that is more volatile than the market with a high frequency of downside shocks compared with another stock with an equally high beta that does not experience the same kind of price movements to the downside.

Practical Value of the CAPM

Considering the critiques of the CAPM and the assumptions behind its use in portfolio construction, it might be difficult to see how it could be useful. However, using the CAPM as a tool to evaluate the reasonableness of future expectations or to conduct comparisons can still have some value.

Imagine an advisor who has proposed adding a stock to a portfolio with a \$100 share price. The advisor uses the CAPM to justify the price with a discount rate of 13%. The advisor's investment manager can take this information and compare it with the company's past performance and its peers to see if a 13% return is a reasonable expectation. Assume in this example that the peer group's performance over the last few years was a little better than 10%, while this stock had consistently underperformed, with 9% returns. The investment manager shouldn't take the advisor's recommendation without some justification for the increased expected return.

What is economic analysis?

The purpose of economic analyses is to provide a systematic approach for evaluating the costs, benefits, and impacts of economic decisions.

Often, the best way to do this is by ranking projects based on their economic viability, which will help you choose the most beneficial option.

What are the methods of economic analysis?

There are a range of different methods of economic analysis, but two are seen as the primary methods: Deductive and Inductive.

Deductive method: Starts with a general principle or theory and tests it with specific observations.

Inductive method: Starts with specific observations and uses them to form a general hypothesis or theory.

Let's unwrap each method in more detail:

1. Deductive method

This method involves moving from general principles to specific conclusions. It's often associated with theoretical economics.

According to the [Unacademy](#), this method requires the person (or persons) to “*assume the factual information and then follow the phase of logical reasoning to arrive at a concrete result or conclusion.*” A theory is then built on those assumptions.

Steps:

- **Formulate a hypothesis** based on existing economic theory.
- **Use logical reasoning** to deduce implications or predictions.
- **Test these predictions** against real-world data.

2. Inductive method

This method involves drawing general conclusions from specific observations. It's often used in empirical economics.

Steps:

- **Observe specific economic** phenomena.
- **Collect data** related to these phenomena.
- **Analyze the data** to identify patterns and trends.

- **Formulate general economic theories** or principles based on the findings.

Examples of economic analysis: How to measure it

CFOs are key to shaping a company's **financial strategy**, which directly impacts its economic health.

The steps of performing an economic analysis usually take the form of something like this:

1. **Define the goal:** Clearly define what you want to achieve with the analysis.
2. **Consider uncertainties:** Identify potential factors that could affect the outcome and create a list of these assumptions.
3. **Explore alternatives:** Determine different approaches or solutions.
4. **Analyze Costs and Benefits:** Evaluate the advantages and disadvantages of each option.
5. **Compare choices:** Assess the options and compare alternatives based on their costs and benefits.
6. **Test assumptions:** Carry out sensitivity and uncertainty analyses to analyze how changes in factors might impact the results.
7. **Present findings:** Summarize the results and recommend a course of action.

You might want to incorporate other approaches to your economic analysis process. Here are some of the common ways you can do this:

1. Microeconomic and macroeconomic analysis

Microeconomic analysis: Looks at specific markets and how consumers and businesses behave.

It covers:

- Supply and demand
- Pricing
- Production
- Consumption patterns

Macroeconomic analysis: Studies the entire economy. Key areas include:

- GDP
- Unemployment
- Inflation
- Overall economic growth

2. Financial ratio analysis

Financial ratio analysis is a way to check a company's health by using numbers from its **financial reports**. Key numbers include how well the company can pay its bills (liquidity), how much it earns (profitability), and how much it owes (leverage).

3. Cost-benefit analysis (CBA)

Cost-benefit analysis weighs up the potential costs and benefits of a project or decision to see if it's worth doing and how much it could make.

4. Scenario and sensitivity analysis

Scenario analysis involves evaluating different future scenarios to understand potential impacts on the company, while sensitivity analysis shows how changing key factors affect results.

5. Net Present Value (NPV) and Internal Rate of Return (IRR)

NPV and IRR are ways to figure out if an investment is worth it. NPV adds up future money, adjusted for today's value, and subtracts the upfront cost. IRR is the percentage return the investment needs to make to break even.

6. Benchmarking

Benchmarking involves comparing a company's performance metrics with industry standards or competitors to identify areas for improvement and set performance goals.

7. Economic value added (EVA)

EVA shows how much extra a company makes beyond what investors expect. It's the profit after taxes and other costs, minus the money it costs to run the business.

8. Trend analysis and forecasting

Trend analysis examines historical data to identify patterns and trends over time, while [forecasting](#) uses this information to predict future financial performance.

9. Risk and uncertainty analysis

[Risk and uncertainty analysis](#) helps CFOs understand what could go wrong with economic decisions. It looks at things like:

- Market ups and downs
- Economic cycles
- Unexpected events

This helps predict how these factors might affect business outcomes.

10. Behavioral economics

Behavioral economics looks at how our thoughts, feelings, and social lives affect our money choices. It shows that we don't always make decisions like the old money books say.

What is Industry Analysis?

Industry analysis is a market assessment tool used by businesses and analysts to understand the competitive dynamics of an industry. It helps them get a sense of what is happening in an industry, e.g., [demand-supply statistics](#), degree of competition within the industry, [state of competition](#) of the industry with other emerging industries, future prospects of the industry taking into account technological changes, credit system within the industry, and the influence of [external factors](#) on the industry.

Industry analysis, for an entrepreneur or a company, is a method that helps to understand a company's position relative to other participants in the industry. It helps them to identify both the opportunities and threats coming their way and gives them a strong idea of the present and future scenario of the industry. The key to surviving in this ever-changing business environment is to understand the differences between yourself and your competitors in the industry and use it to your full advantage.

Types of industry analysis

There are three commonly used and important methods of performing industry analysis. The three methods are:

1. [Competitive Forces Model \(Porter's 5 Forces\)](#)

2. [Broad Factors Analysis \(PEST Analysis\)](#)
3. [SWOT Analysis](#)

#1 Competitive Forces Model (Porter's 5 Forces)

One of the most famous models ever developed for industry analysis, famously known as [Porter's 5 Forces](#), was introduced by Michael Porter in his 1980 book "[Competitive Strategy: Techniques for Analyzing Industries and Competitors](#)."

According to Porter, analysis of the five forces gives an accurate impression of the industry and makes analysis easier. In our [Corporate & Business Strategy course](#), we cover these five forces and an additional force — power of complementary good/service providers.

1. Intensity of industry rivalry

The number of participants in the industry and their respective market shares are a direct representation of the competitiveness of the industry. These are directly affected by all the factors mentioned above. Lack of differentiation in products tends to add to the intensity of competition. High exit costs such as high fixed assets, government restrictions, labor unions, etc. also make the competitors fight the battle a little harder.

2. Threat of potential entrants

This indicates the ease with which new firms can enter the market of a particular industry. If it is easy to enter an industry, companies face the constant risk of new competitors. If the entry is difficult, whichever company enjoys little [competitive advantage](#) reaps the benefits for a longer period. Also, under difficult entry circumstances, companies face a constant set of competitors.

3. Bargaining power of suppliers

This refers to the [bargaining power of suppliers](#). If the industry relies on a small number of suppliers, they enjoy a considerable amount of bargaining power. This can particularly affect small businesses because it directly influences the quality and the price of the final product.

4. Bargaining power of buyers

The complete opposite happens when the bargaining power lies with the customers. If consumers/buyers enjoy market power, they are in a position to negotiate lower prices, better quality, or additional services and discounts. This is the case in an industry with more competitors but with a single buyer constituting a large share of the industry's sales.

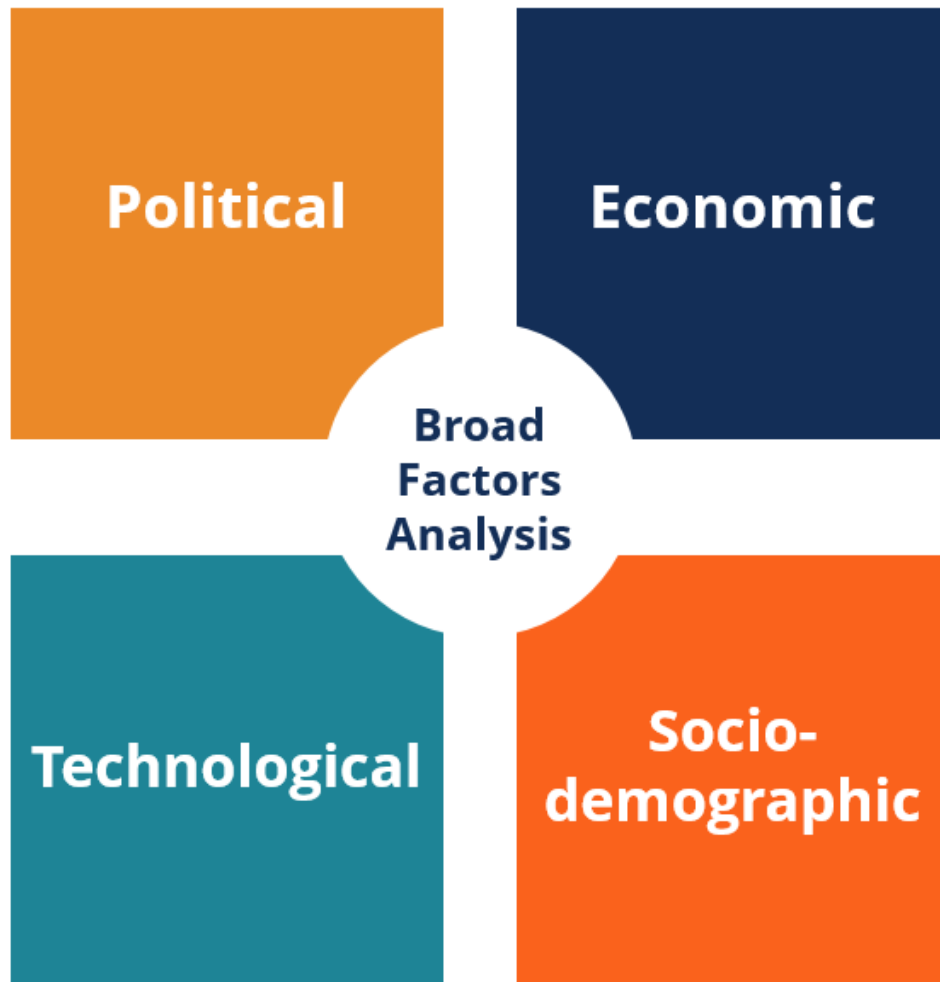
5. Threat of substitute goods/services

The industry is always competing with another industry producing a similar substitute product. Hence, all firms in an industry have potential competitors from other industries. This takes a toll on their profitability because they are unable to charge exorbitant prices. Substitutes can take two forms – products with the

same function/quality but lesser price, or products of the same price but of better quality or providing more utility.

#2 Broad Factors Analysis (PEST Analysis)

Broad Factors Analysis, also commonly called the PEST Analysis stands for Political, Economic, Social and Technological. PEST analysis is a useful framework for analyzing the external environment.



The above image comes from a section of CFI's [Corporate & Business Strategy Course](#).

To use PEST as a form of industry analysis, an analyst will analyze each of the 4 components of the model. These components include:

1. Political

Political factors that impact an industry include specific policies and regulations related to things like taxes, environmental regulation, tariffs, trade policies, labor laws, ease of doing business, and overall political stability.

2. Economic

The economic forces that have an impact include inflation, exchange rates (FX), interest rates, GDP growth rates, conditions in the capital markets (ability to access capital), etc.

3. Social

The social impact on an industry refers to trends among people and includes things such as population growth, demographics (age, gender, etc.), and trends in behavior such as health, fashion, and social movements.

4. Technological

The technological aspect of PEST analysis incorporates factors such as advancements and developments that change the way a business operates and the ways in which people live their lives (e.g., the advent of the internet).

#3 SWOT Analysis

[SWOT Analysis](#) stands for Strengths, Weaknesses, Opportunities, and Threats. It can be a great way of summarizing various industry forces and determining their implications for the business in question.



The above image comes from a section of CFI's [Corporate & Business Strategy Course](#). Check it out to learn more about performing SWOT analysis.

1. Internal

Internal factors that already exist and have contributed to the current position and *may* continue to exist.

2. External

External factors are usually contingent events. Assess their importance based on the likelihood of them happening and their potential impact on the company. Also, consider whether management has the intention and ability to take advantage of the opportunity/avoid the threat.

Importance of Industry Analysis

Industry analysis, as a form of market assessment, is crucial because it helps a business understand market conditions. It helps them forecast demand and supply and, consequently, financial returns from the business. It indicates the competitiveness of the industry and costs associated with entering and exiting the industry. It is very important when planning a small business. Analysis helps to identify which stage an

industry is currently in; whether it is still growing and there is scope to reap benefits or has reached its saturation point.

With a very detailed study of the industry, entrepreneurs can get a stronghold on the operations of the industry and may discover untapped opportunities. It is also important to understand that industry analysis is somewhat subjective and does not always guarantee success. It may happen that incorrect interpretation of data leads entrepreneurs to a wrong path or into making wrong decisions. Hence, it becomes important to collect data carefully.

What Is Company Analysis?

Company analysis is a detailed examination of a company's operations, financials, management, products, competitors, market position, and industry trends. It helps investors understand a business before investing in its stock. The goal is to determine whether the stock is undervalued or overvalued compared to its true worth.

This process examines the company's details and gives insight into how it handles external threats and opportunities. By studying its strengths and weaknesses, you can get a clearer picture of its overall position in the market. Simply, an analysis of a company provides a snapshot of the business and what drives its success.

Why is Company Analysis Important for Investors?

Overview of Different Types of Company Analysis

Company analysis can be classified into various methods. The two main types are:

- **Fundamental Analysis:** Focuses on a company's intrinsic value by examining financial statements and overall performance.
- **Technical Analysis:** Uses historical market data, price charts, and trading volumes to forecast future movements.

Company Analysis Definition

Understanding Company Analysis in the Context of Investing

Company analysis involves deep research into a company's fundamentals to assess its financial strength and competitive standing. It enables investors to make informed decisions by evaluating data-driven and qualitative indicators.

The Goal of Conducting a Company Analysis

The main goal is to determine whether an investment is justified based on the company's ability to generate returns, withstand market challenges, and grow in the long run.

Types of Company Analysis

Fundamental Analysis: Understanding Financial Health and Market Position

This method analyses revenue, expenses, assets, liabilities, and profit trends, helping assess long-term value.

Technical Analysis: Using Historical Data and Charts

This method focuses on patterns and momentum indicators, derived from price and volume data, to anticipate future price

Company Valuation Methods

Price-to-Earnings (P/E) Ratio and Its Importance

The price to earnings ratio measures the company's share price relative to its earnings per share, helping assess if the stock is undervalued or overvalued.

Price-to-Book (P/B) Ratio in Company Valuation

The price to book ratio compares a company's market value to its book value, which is extremely useful for evaluating capital-intensive firms.

Discounted Cash Flow (DCF) Method for Valuing Companies

This method estimates present value of future cash flows, adjusted for risk, making it a robust method for growth forecasting.

Methods For Company Analysis:

Top-Down Strategy:

1.

This starts with the big picture. Investors look at macroeconomic factors like monetary policy, [inflation](#), and economic growth before focusing on individual stocks. The idea is to identify market trends or events that offer opportunities.

For example, elections in India often significantly influence markets. A top-down investor might analyze this event to spot potential opportunities. Most top-down investors are more interested in broader economic cycles than individual stocks. Their strategy focuses on short-term gains driven by macro trends rather than finding undervalued companies.

BOTTOM OF TECINQUE

This approach flips the script. Here, the focus is on individual companies. Investors study company-specific factors like price-to-earnings ratios, debt-to-equity ratios, cash flow, and management quality. Once they identify strong companies, they build a portfolio around these microeconomic details. The bottom-up approach deals with long-term growth and each company's unique characteristics.

Elements Of Company Analysis:

1.

Analysis of the core documents:

The core reports reveal a company's performance through the balance sheet, income statement, and cash flow statement. These highlight assets, liabilities, revenue, expenses, and cash flows, helping you evaluate financial

health and growth prospects. Publicly traded companies file these reports with market regulators, making them accessible online or on stock exchanges like [NSE](#) and [BSE](#). The core documents include-

- **Balance Sheet:** It shows assets, liabilities, and equity. It helps assess liquidity, leverage, and solvency to help gauge financial stability and growth potential.
- **Income Statement:** It tracks revenue, expenses, and profit. Metrics like EBITDA and net income reveal profitability and cost efficiency. It's key for understanding trends and estimating future returns.
- **Cash Flow Statement:** It analyzes cash inflows and outflows, highlighting liquidity and solvency. Metrics like operating cash flow and free cash flow assess financial flexibility and shareholder returns. It offers a clearer picture of financial health than other statements.

2.

Financial Analysis:

Financial ratios are tools to analyze a company's performance using data from financial statements like the balance sheet and income statement. They offer insights into profitability, debt levels, cash flow, and stock valuation. Investors and [stock market advisory services](#) providers often use these ratios to track trends, compare companies, and make informed decisions. The main ratios include-

- **Profitability Ratios:** Metrics like gross profit margin and [return on equity](#) reveal how efficiently a company generates profits from sales and [investments](#). Higher profitability ratios generally indicate better efficiency and profitability.
- **Leverage Ratios:** Ratios such as debt-to-equity assess a company's debt load and repayment capacity. Lower leverage ratio values suggest less financial risk, though moderate leverage can enhance returns.
- **Liquidity Ratios:** Current and quick ratios measure a company's ability to meet short-term obligations. A current ratio above 1 or a quick ratio around 1 is considered ideal.
- **Valuation Ratios:** Metrics like price-to-earnings (P/E) indicate if a stock is undervalued or overvalued. Lower ratios are better for value investors, while high ratios can signal growth potential.
- **Revenue and Earnings Analysis:** Revenue growth and earnings trends highlight market demand and profitability. Higher and consistent growth signals strong fundamentals.

3.

Analyzing market and product:

Market and product analysis evaluates demand, supply, and pricing to gauge a product's viability and profitability. It guides decisions by studying customer needs, costs, and competition through product demand, supply, and pricing parameters.

4.

Analysis of strengths and opportunities:

A SWOT report evaluates a company's Strengths, Weaknesses, Opportunities, and Threats. It analyzes financial statements, competitors, economic trends, and other relevant information to give a clear picture of its strategic position.

Strengths and weaknesses reveal insights into financial health, brand value, and operations, while opportunities and threats focus on market demand, competition, and regulations. SWOT reports help assess competitive positioning and growth potential, making them valuable for investment decisions. Analysts and investors can find these reports in equity research, annual reports, and financial databases.

5.

Analyzing the company's valuation:

Valuation analysis helps estimate a company's worth by examining its fundamentals and growth potential. It uses annual reports and investor presentation data to identify whether a stock is undervalued or overvalued.

Techniques like discounted cash flow, comparables, and residual income models are used with inputs such as revenue growth, profit margins, and cost of capital. The outcome—a fair value per share—is compared to the stock's market price to guide decisions. For Indian stocks, this process highlights value drivers, enables sensitivity analysis, and turns financial insights into actionable investment strategies.

Risk Assessment in Company Analysis

Macroeconomic Risks: How the Economy Affects Companies

Interest rates, inflation, exchange rates, and GDP growth affect demand and cost structures.

Industry-Specific Risks: External Factors Impacting Performance

Technological disruption, new entrants, or regulatory changes can impact industry dynamics.

Political and Regulatory Risks: Understanding Their Impact

Tax reforms, policy shifts, and political instability can alter operational viability and margins.

Qualitative Factors in Company Analysis

The Role of Management in Company Performance

Strong leadership drives innovation, employee morale, and strategic execution.

Market Position, Innovation, and Corporate Governance

A firm's competitive edge depends on differentiation, adaptability, and ethical conduct.

Limitations of Company Analysis

Market Sentiment and External Factors

Even well-analyzed stocks may underperform due to irrational market trends or black swan events.

Biases in Company Analysis and Their Impact

Confirmation bias or overreliance on optimistic forecasts can distort judgement.

Technical analysis

In finance, **technical analysis** is an [analysis](#) methodology for analysing and forecasting the direction of [prices](#) through the study of past market data, primarily price and volume.^[1] As a type of [active management](#), it stands in contradiction to much of [modern portfolio theory](#). The efficacy of technical analysis is disputed by the [efficient-market hypothesis](#), which states that stock market prices are essentially unpredictable,^[2] and research on whether technical analysis offers any benefit has produced

mixed results.^{[41][45]} It is distinguished from [fundamental analysis](#), which considers a company's financial statements, health, and the overall state of the market and economy.

Comparison with fundamental analysis

Contrasting with technical analysis is [fundamental analysis](#): the study of economic and other underlying factors that influence the way investors price financial markets. This may include regular corporate metrics like a company's recent [EBITDA](#) figures, the estimated impact of recent staffing changes to the [board of directors](#), geopolitical considerations, and even scientific factors like the estimated future effects of [global warming](#). Pure forms of technical analysis can hold that prices already reflect all the underlying fundamental factors. Uncovering future trends is what technical indicators are designed to do, although neither technical nor fundamental indicators are perfect. Some traders use technical or fundamental analysis exclusively, while others use both types to make trading decisions.[†]

Comparison with quantitative analysis

The contrast against [quantitative analysis](#) is less clear cut than the distinction with fundamental analysis. Some sources treat technical and quantitative analysis as more or less synonymous, while others draw a sharp distinction. For example, quantitative analysis expert [Paul Wilmott](#) suggests technical analysis is little more than 'charting' (making forecasts based on extrapolating graphical representations), and that technical analysis rarely has any predictive power.

Efficient-market hypothesis

The [efficient-market hypothesis](#) (EMH) contradicts the basic tenets of technical analysis by stating that past prices cannot be used to profitably predict future prices. Thus it holds that technical analysis cannot be effective. Economist [Eugene Fama](#) published the seminal paper on the EMH in the *Journal of Finance* in 1970, and said "In short, the evidence in support of the efficient markets model is extensive, and (somewhat uniquely in economics) contradictory evidence is sparse."^[46]

However, because future stock prices can be strongly influenced by investor expectations, technicians claim it only follows that past prices influence future prices.^[47] They also point to research in the field of [behavioral finance](#), specifically that people are not the rational participants EMH makes them out to be. Technicians have long said that irrational human behavior influences stock prices, and that this behavior leads to predictable outcomes.^[48] Author David Aronson says that the theory of behavioral finance blends with the practice of technical analysis:

By considering the impact of emotions, cognitive errors, irrational preferences, and the dynamics of group behavior, behavioral finance offers succinct explanations of excess market volatility as well as the excess returns earned by stale information strategies.... cognitive errors may also explain the existence of market inefficiencies that spawn the systematic price movements that allow objective TA [technical analysis] methods to work.^[47]

EMH advocates reply that while individual market participants do not always act rationally (or have complete information), their aggregate decisions balance each other, resulting in a rational outcome (optimists who buy stock and bid the price higher are countered by pessimists who sell their stock, which keeps the price in equilibrium).^[49] Likewise, complete information is reflected in the price because all market participants bring their own individual, but incomplete, knowledge together in the market.^[49]

Random walk hypothesis

The [random walk hypothesis](#) may be derived from the weak-form efficient markets hypothesis, which is based on the assumption that market participants take full account of any information contained in past price movements (but not necessarily other public information). In his book *A Random Walk Down Wall Street*, Princeton economist [Burton Malkiel](#) said that technical forecasting tools such as pattern analysis must ultimately be self-defeating: "The problem is that once such a regularity is known to market participants, people will act in such a way that prevents it from happening in the future."^[50] Malkiel has

stated that while momentum may explain some stock price movements, there is not enough momentum to make excess profits. Malkiel has compared technical analysis to "[astrology](#)".^[51]

In the late 1980s, professors Andrew Lo and Craig McKinlay published a paper which cast doubt on the random walk hypothesis. In a 1999 response to Malkiel, Lo and McKinlay collected empirical papers that questioned the hypothesis' applicability^[52] that suggested a non-random and possibly predictive component to stock price movement, though they were careful to point out that rejecting random walk does not necessarily invalidate EMH, which is an entirely separate concept from RWH. In a 2000 paper, [Andrew Lo](#) back-analyzed data from the U.S. from 1962 to 1996 and found that "several technical indicators do provide incremental information and may have some practical value".^[5] Burton Malkiel dismissed the irregularities mentioned by Lo and McKinlay as being too small to profit from.^[51]

Technicians argue that the EMH and random walk theories both ignore the realities of markets, in that participants are not completely rational and that current price moves are not independent of previous moves.^{[18][53]} Some signal processing researchers negate the random walk hypothesis that stock market prices resemble [Wiener processes](#), because the statistical moments of such processes and real stock data vary significantly with respect to window size and [similarity measure](#).^[54] They argue that feature transformations used for the description of audio and [biosignals](#) can also be used to predict stock market prices successfully which would contradict the random walk hypothesis.

The random walk index (RWI) is a technical indicator that attempts to determine if a stock's price movement is random in nature or a result of a statistically significant trend. The random walk index attempts to determine when the market is in a strong uptrend or downtrend by measuring price ranges over N and how it differs from what would be expected by a random walk (randomly going up or down). The greater the range suggests a stronger trend.^[55]

Applying Kahneman and Tversky's [prospect theory](#) to price movements, Paul V. Azzopardi provided a possible explanation why fear makes prices fall sharply while greed pushes up prices gradually.^[56] This commonly observed behaviour of securities prices is sharply at odds with random walk. By gauging greed and fear in the market,^[57] investors can better formulate long and short portfolio stances.

Scientific technical analysis

Caginalp and Balenovich in 1994^[58] used their asset-flow differential equations model to show that the major patterns of technical analysis could be generated with some basic assumptions. Some of the patterns such as a triangle continuation or reversal pattern can be generated with the assumption of two distinct groups of investors with different assessments of valuation. The major assumptions of the models are the finiteness of assets and the use of trend as well as valuation in decision making. Many of the patterns follow as mathematically logical consequences of these assumptions.

One of the problems with conventional technical analysis has been the difficulty of specifying the patterns in a manner that permits objective testing.

Japanese candlestick patterns involve patterns of a few days that are within an uptrend or downtrend. Caginalp and Laurent^[59] were the first to perform a successful large scale test of patterns. A mathematically precise set of criteria were tested by first using a definition of a short-term trend by smoothing the data and allowing for one deviation in the smoothed trend. They then considered eight major three-day candlestick reversal patterns in a non-parametric manner and defined the patterns as a set of inequalities. The results were positive with an overwhelming statistical confidence for each of the patterns using the data set of all S&P 500 stocks daily for the five-year period 1992–1996.

Among the most basic ideas of conventional technical analysis is that a trend, once established, tends to continue. However, testing for this trend has often led researchers to conclude that stocks are a random walk. One study, performed by Poterba and Summers,^[60] found a small trend effect that was too small to

be of trading value. As Fisher Black noted,^[61] "noise" in trading price data makes it difficult to test hypotheses.

One method for avoiding this noise was discovered in 1995 by Caginalp and Constantine^[62] who used a ratio of two essentially identical closed-end funds to eliminate any changes in valuation. A closed-end fund (unlike an open-end fund) trades independently of its net asset value and its shares cannot be redeemed, but only traded among investors as any other stock on the exchanges. In this study, the authors found that the best estimate of tomorrow's price is not yesterday's price (as the efficient-market hypothesis would indicate), nor is it the pure momentum price (namely, the same relative price change from yesterday to today continues from today to tomorrow). But rather it is almost exactly halfway between the two.

Starting from the characterization of the past time evolution of market prices in terms of price velocity and price acceleration, an attempt towards a general framework for technical analysis has been developed, with the goal of establishing a principled classification of the possible patterns characterizing the deviation or defects from the random walk market state and its time translational invariant properties.^[63] The classification relies on two dimensionless parameters, the [Froude number](#) characterizing the relative strength of the acceleration with respect to the velocity and the time horizon forecast dimensionalized to the training period. Trend-following and contrarian patterns are found to coexist and depend on the dimensionless time horizon. Using a [renormalisation group](#) approach, the probabilistic based scenario approach exhibits statistically significant predictive power in essentially all tested market phases.

A survey of modern studies by Park and Irwin^[64] showed that most found a positive result from technical analysis.

In 2011, Caginalp and DeSantis^[65] have used large data sets of closed-end funds, where comparison with valuation is possible, in order to determine quantitatively whether key aspects of technical analysis such as trend and resistance have scientific validity. Using data sets of over 100,000 points they demonstrate that trend has an effect that is at least half as important as valuation. The effects of volume and volatility, which are smaller, are also evident and statistically significant. An important aspect of their work involves the nonlinear effect of trend. Positive trends that occur within approximately 3.7 standard deviations have a positive effect. For stronger uptrends, there is a negative effect on returns, suggesting that profit taking occurs as the magnitude of the uptrend increases. For downtrends the situation is similar except that the "buying on dips" does not take place until the downtrend is a 4.6 standard deviation event. These methods can be used to examine investor behavior and compare the underlying strategies among different asset classes.

In 2013, Kim Man Lui and T Chong pointed out that the past findings on technical analysis mostly reported the profitability of specific trading rules for a given set of historical data. These past studies had not taken the human trader into consideration as no real-world trader would mechanically adopt signals from any technical analysis method. Therefore, to unveil the truth of technical analysis, we should get back to understand the performance between experienced and novice traders. If the market really walks randomly, there will be no difference between these two kinds of traders. However, it is found by experiment that traders who are more knowledgeable on technical analysis significantly outperform those who are less knowledgeable

What is the Volume Price Trend Indicator (VPT)?

The Volume Price Trend Indicator (VPT) is a stock market indicator that helps traders relate a stock's price and trading volume. It helps in identifying the parity between the [supply and demand](#) for a stock and also helps in predicting the price of a stock, both in direction and magnitude.

Formula for Calculating the Volume Price Trend Indicator

$$\text{VPT} = \text{Previous VPT} + \text{Volume} \times (\text{Today's Closing Price} - \text{Previous Closing Price}) / \text{Previous Closing Price}$$

The idea behind the indicator is to multiply the market volume of a stock by the percentage change in its price. If the price of the stock declines, the value of the indicator falls. If the price increases, the value rises. The VPT is generally calculated on a daily basis, though it can be measured over any timeframe with which [volume data](#) is available.

The VPT is very similar to on-balance volume (OBV). In OBV, there is an increase or decrease in the indicator based on only price movements. The percentage move in price is not considered in the calculation. However, in VPT, the indicator moves based on the percentage shift in price.

Interpreting the VPT

When investors and traders look at the VPT, they are usually for divergences. A divergence is when the price of a stock moves in the opposite direction of an indicator. It usually suggests that there may be a change in the direction of the price.

For example, if volume remains constant, but there is an increase in price, it usually suggests that the price movement is weak, and there is a high chance of it being reversed. A trader who uses VPT and observes the fact, may not pursue [long trades](#), expecting the market to go up further.

The interpretations of the VPT can be summed up as follows:

- An increase in price, as well as volume, confirms the price trend upward.
- A decrease in price, as well as volume, confirms the price trend downward.
- An increase in price accompanied by a decreasing or flat volume trend is a divergence and may suggest that the downward price movement is weak and won't hold.
- A decrease in price accompanied by an increasing or flat volume trend is a divergence and may suggest that the upward price movement is weak and won't hold.

Trading with the VPT

In technical analysis, the VPT is used mainly on longer-term frames due to its cumulative nature. It becomes difficult to use it on the short-term and intraday charts as the changes can be relatively small when compared to the actual VPT value. The problem persists with all volume-based indicators that use cumulative calculation.

To simplify the analysis, it is recommended to use the VPT indicator along with a [moving average](#) applied to it as a signal line. When a moving average is used, VPT values below the line would suggest negative money flow and to sell, whereas VPT values above the line would suggest positive money flow and to buy.

The VPT can also be used with the [average directional index \(ADX\)](#) to confirm the market trend. The VPT is basically used in conjunction with the 25- to 50-day moving averages. If the moving averages and the VPT are moving in the same direction, then a trader may decide to buy and vice-versa.

Like all technical trading tools, VPT is best used in conjunction with other tools than on its own. Using an indicator independently to make trading decisions will be a form of misuse. The indicators are best used as guides for trading decisions rather than standalone systems.

What is a Technical Indicator?

A technical indicator is a mathematical pattern derived from historical data used by technical traders or investors to predict future price trends and make trading decisions. It uses a mathematical formula to derive a series of data points from past price, volume, and open interest data.

A technical indicator is usually shown graphically and compared with the corresponding price chart for analysis. The mechanics of a technical indicator captures the behavior and sometimes the investors' psychology to provide a clue of future trends of price activity.

Technical indicators offered in technical analysis to predict future price movements include cycle volumes, momentum readings, volume patterns, price trends, [Bollinger Bands](#), moving average, Elliot waves, oscillators, and sentiment indicators. Besides providing valuable insight into the price structure, a technical indicator also shows how to reap potential profits from price movements.

Understanding Technical Indicators

A technical indicator is generally a mathematically derived representation of data, such as price, volume, or open interest, to detect stock movement. The indicator is weighed based on historically-adjusted returns, common sense, an investor's objective, and logic to evaluate investments and identify trading opportunities.

Some technical indicators generate signals as stand-alone, while others supplement each other. As elements of [technical analysis](#), they are used to evaluate a security's strength or weakness by focusing on trading signals, patterns or price movements, and other analytical charting tools. Although there are non-specific technical indicators with regard to the market, some technical indicators are meant to be used for a specific financial market.

Types of Technical Indicators

1. Oscillators

Oscillators are a special subset of technical indicators that oscillates between a local minimum and maximum and focuses on market momentum. They are best used to provide readings of overbought and oversold price movements. Traders and investors define price turns and reversals within ranging markets using oscillators because they swing within a generally defined range.

In many cases, technical analysts consider using multiple oscillators on a single chart as redundant because they bear a striking similarity in their mathematical formulas, function, and appearance. Technical analysis uses oscillators, such as relative strength.

2. Overlays

Overlays are special types of technical indicators used by traders and investors to identify overbought and oversold levels. They provide insight into the supply and demand of a stock. Commonly used overlays include Bollinger Bands and [moving average](#).

Other than giving the overbought and oversold conditions, Bollinger Bands measure the impending market volatility. On the other hand, moving averages are used to determine and measure the strength of a market trend.

Common Technical Indicators

1. Accumulation/Distribution Line (A/D Line)

The Accumulation/Distribution Line is commonly used to determine a security's money flow. The A/D line focuses only on the security's closing price and trading range for the period. A buying interest is shown when the indicator line is trending up, while a falling indicator line shows a downtrend.

2. On-Balance-Volume (OBV)

[On-Balance-Volume \(OBV\)](#) applies to securities over time, where it measures the flow of trading volume. A rising OBV suggests the buyers' willingness to enter the market. Conversely, a falling OBV suggests lower prices when selling volume outpaces buying volume. OBV is, therefore, a confirmation indicator for a continuous trend.

3. Average Direction indicator (ADX)

Traders and investors use the Average Direction indicator (ADX) to measure a trend's strength and momentum. A robust direction strength, either up or down, is in the offing when the ADX is above 40. A weak trend or non-trending is suggestive when the indicator is below 20.

4. Moving Average Convergence Divergence (MACD)

Traders use Moving Average Convergence Divergence (MACD) to see the direction and momentum of a trend that provides different trade signals. When the price is on an upward phase, the MACD is above zero, while a below-zero MACD is suggestive of a bearish period.

Combining Multiple Technical Indicators

Technical analysts analyze technical indicators independently to perceive possible changes in the behavior of each indicator. The structural changes within the various [financial markets](#) render the behavior of some technical indicators substantial.

For this reason, there are overwhelming combinations of technical indicators. Some combinations are complex to understand and work with, while other combinations prove easy, especially when weights are assigned to each indicator.

An example of a technical indicator combination is the Commodex Trend Index. The Commodex Trend Index incorporates other subjective forms of technical analysis, such as crossovers of a fast and slow-moving average, liquidation, open interest, and volume momentum.

The efficient market hypothesis (EMH) is an investment theory stating that asset prices reflect all available information, making it impossible to consistently "beat the market". This means stocks are always at their fair value, and it's difficult to gain an edge through stock picking or market timing, as prices react instantly to new information. The theory has three forms: weak, semi-strong, and strong, which vary in the type of information they claim is reflected in prices.

Forms of market efficiency

- **[Weak form efficiency](#):** Prices reflect all historical market data, making technical analysis (studying past prices and volume) ineffective.
- **[Semi-strong form efficiency](#):** Prices reflect all publicly available information, such as news reports and financial statements. This makes fundamental analysis (evaluating public information) ineffective.
- **[Strong form efficiency](#):** Prices reflect all information, both public and private (insider information). This implies that no one can consistently outperform the market, as even private information is already priced in.

Implications and criticisms

- **Investment strategy:** Under EMH, a sound strategy is to invest in passive, low-cost index funds to match the market's performance, rather than trying to outperform it through active trading.
- **Random walk:** The theory aligns with the idea of a "random walk," where price changes are unpredictable because they are driven by new, unpredictable information.
- **Criticism:** EMH is controversial. Critics point to market anomalies like the existence of bubbles and crashes, and the long-term success of some active fund managers, as evidence against perfect market efficiency, notes Investopedia and [EBSCO](#).

Portfolio performance evaluation is the systematic process of assessing how well an investment portfolio has performed by measuring its returns, analyzing its risk, and comparing it against a benchmark and its own goals. It involves calculating returns, evaluating risk-adjusted returns using metrics like the [Sharpe ratio](#), comparing the portfolio's performance to benchmarks, and ensuring the portfolio aligns with the investor's objectives and making necessary adjustments.

Key components of portfolio performance evaluation

- **Return Measurement:**
Calculating the total return on the portfolio, which includes price changes, dividends, and interest.

- **Risk Analysis:**

Analyzing the risk taken to achieve returns. Risk-adjusted performance metrics are used to determine if the returns were sufficient given the level of risk, notes [AnalystPrep](#) and [Investopedia](#).

- **Benchmark Comparison:**

Comparing the portfolio's performance against a relevant market benchmark to see how it has performed relative to the overall market or a specific sector.

- **Goal Alignment:**

Ensuring the portfolio's performance is on track to meet the investor's financial goals, such as retirement, income generation, or capital preservation, based on the time horizon of the goals, according to [College Hive](#) and [Seeking Alpha](#).

Common methods and metrics

- **Traditional methods:** These include benchmark comparison and style comparison.

- **Risk-adjusted methods:** These adjust returns for risk. Examples include:

- **Sharpe Ratio:** Measures excess return per unit of risk.

- **Treynor Ratio:** Measures excess return per unit of systematic risk.

- **Jensen's Alpha:** Measures the portfolio's excess return compared to the expected return based on its beta.

- **Dollar-Weighted Rate of Return (DWR):** This is the internal rate of return (IRR) and considers the timing and amount of cash flows into and out of the portfolio.

Actionable steps

- Regularly review your current net worth and portfolio value.

- Compare your portfolio's performance against appropriate benchmarks and similar investments.

- Assess whether the portfolio's performance is aligned with your long-term and short-term financial goals.

- Make necessary adjustments to the portfolio to stay on track, notes [Dilzer](#)

What Is Portfolio Management?

Portfolio management is the process of [balancing risk against performance](#), determining the right mix of assets to optimize returns for the amount of risk you're willing to accept.

While many people manage their own investment portfolios, many rely on professional portfolio managers. Regardless of approach, successfully managing a portfolio requires an in-depth understanding of the key building blocks that drive investment success, including thoughtful asset allocation, [proper diversification](#), and disciplined rebalancing practices.

Understanding Portfolio Management

Professional licensed portfolio managers work on behalf of clients, while individuals can build and manage their own portfolios. In either case, the portfolio manager's ultimate goal is to maximize the investments' expected return within an appropriate level of risk exposure.¹

Portfolio management requires the ability to weigh the strengths and weaknesses, opportunities, and threats of a spectrum of investments. These choices involve trade-offs, from debt versus equity to domestic versus international and growth versus safety.

Key Terms in Portfolio Management, With Examples

Term	Definition	Examples
Active Management	A strategy where portfolio managers actively buy and sell securities in an attempt to outperform a benchmark.	A fund manager might overweight technology stocks believing the sector will outperform the market.
Alpha	The excess return of an investment relative to its benchmark.	An alpha of 1% means the investment outperformed its benchmark by 1%.
Asset Allocation	The distribution of assets (e.g., stocks, bonds, real estate) within a portfolio to achieve a preferred risk-return profile.	Conservative investors often have a higher allocation of bonds, while aggressive investors want more exposure to growth stocks.
Asset Class	A group of investments with similar characteristics (e.g., stocks, bonds, real estate).	A diversified portfolio might include multiple asset classes.
Benchmark	A standard against which the performance of an investment or portfolio is measured.	A common benchmark for U.S. stocks is the S&P 500 index.
Beta	A measure of an investment's volatility in relation to the overall market.	A beta of 1 means the investment moves in line with the market, while a beta greater than 1 indicates higher volatility.
Diversification	Spreading investments across assets to lower risk.	Owning stocks from different industries or countries.
Index Fund	A type of mutual fund or exchange-traded fund (ETF) that tracks the performance of a specific market index	The S&P 500 index tracks the largest 500 American publicly traded companies in terms of market capitalization.
Liquidity	The ease with which an asset can be converted into cash without affecting its market price.	Stocks and ETFs are considered more liquid than real estate.
Net Asset Value (NAV)	The value per share of a mutual fund or ETF on a specific date or time.	The NAV of a mutual fund fluctuates daily based on the market value of its underlying holdings.
Passive	A strategy that aims to replicate the performance	An investor might choose a passive

Key Terms in Portfolio Management, With Examples

Term	Definition	Examples
Management	of a benchmark index, often through investing in index funds or ETFs.	S&P 500 index fund to mirror the performance of the U.S. large-cap market.
Portfolio Optimization	The process of selecting the best portfolio (asset allocation) given the investor's constraints and objectives.	Modern portfolio theory is a common approach to portfolio optimization.
Rebalancing	Adjusting a portfolio's asset allocation back to its target percentages to maintain the desired risk-return profile.	Selling some stocks and buying more bonds to return to a target allocation of 60% stocks and 40% bonds.
Risk Tolerance	An investor's ability and willingness to withstand changes in the value of their holdings.	An investor with a high-risk tolerance might be comfortable with a portfolio of mostly stocks.
Risk-Return Tradeoff	The principle that potential returns rise with an increase in risk. Thus, lower-risk investments offer lower potential returns, while higher-risk investments offer higher potential returns.	Stocks are generally considered riskier than bonds, but they also have the potential for higher returns.
Sharpe Ratio	A measure of risk-adjusted return, calculated as the excess return of an investment over the risk-free rate divided by its standard deviation.	A higher Sharpe ratio indicates better risk-adjusted performance.
Tracking Error	The difference between the performance of a portfolio and the performance of its benchmark index.	A tracking error of 1% means the portfolio's return deviated from the benchmark's return by 1%.
Turnover	The percentage of a portfolio's holdings that are sold and replaced over a specific period.	A high turnover rate can result in higher transaction costs and have tax implications.
Volatility	The degree of variation in prices over time for a given asset.	Stocks with high volatility experience larger price swings than those with low volatility.

Who Uses Portfolio Management

Portfolio management is a critical investment practice used by two types of entities: individual and [institutional investors](#). These categories have distinct strategies, goals, and

resources. Understanding the different approaches and needs of these two types of investors can provide greater insight into how portfolio management techniques are applied across the financial spectrum.

Individual investors often focus on [personal wealth and future needs](#), managing smaller amounts of money with varying degrees of professional assistance. In contrast, institutional investors manage large-scale assets with a professional approach tailored to fulfill specific financial obligations and institutional goals. Both groups, however, aim to improve their returns by managing their portfolios to suit specific circumstances and financial objectives.

Individual Investors

Individual investors have a range of personal goals, risk preferences, and resources. Their objectives include saving for retirement, accumulating wealth for large purchases, funding education for children, or building an emergency fund. Each goal requires a different strategy or risk profile.

Individual investors' risk tolerance and [investment knowledge](#) vary greatly. Their approach to managing investments can range from highly engaged active trading and rebalancing to relying on automated or professional management. As financial markets have evolved and technology has widened access to investment information, individual investors have had wider prospects to tailor their investment strategies to meet their financial objectives.

Institutional Investors

Institutional investors are entities that pool large sums of money and invest those funds into various financial instruments and assets: pension funds, endowments, foundations, banks, and insurance companies. Each has specific objectives and constraints that influence its portfolio management strategies. Many institutional investors have long-term financial obligations that cause them to focus on long-term growth and sustainability over short-term gains.

In addition, institutional investors are often under strict regulatory oversight to ensure they manage their beneficiaries' funds responsibly. Moreover, [ethical and social governance](#) issues increasingly influence their investment decisions. Risk management is a crucial part of the work of an institutional portfolio manager since these entities must balance the need for profitability with the imperative of preserving capital to meet future liabilities.

Institutional investors' investment approaches are typically conservative compared with individual investors, focusing on long-term stability, capital preservation, and meeting future obligations. Indeed, each type of institutional investor has distinct strategies and objectives, but all share the common goal of responsibly managing large pools of capital to meet the needs of their

