

# Securities Analysis & Portfolio Management Unit 1 v3.docx

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## Unit 1 Fundamentals of Savings and Investments

### Learning Objectives

1. Define savings and investments and explain the differences between the two concepts.
2. Identify the importance of savings in achieving financial security and short-term goals.
3. Explain the role of investments in wealth creation and long-term financial planning.
4. Differentiate between various investment options (e.g., stocks, bonds, mutual funds, real estate) and their associated risks.
5. Understand the relationship between risk and return and apply this knowledge to personal financial decisions.
6. Illustrate the power of compounding in both savings and investments.
7. Develop strategies for personal financial planning that balance savings and investment goals.
8. Evaluate the impact of inflation and economic factors on savings and investment decisions.

### Content

- 1.1 Nature and Definitions
- 1.2 Key Differences Between Saving and Investing
- 1.3 Importance of Investments in Wealth Creation
- 1.4 Role of Investments in Economic Growth
- 1.5 Summary
- 1.6 Key Terms
- 1.7 Descriptive Questions
- 1.8 References
- 1.9 Case Study

## 1.0 Introductory Caselet

Ramesh is a 25-year-old software professional working in an esteemed multinational firm. He recently started working and makes a salary of ₹45,000 per month. After all his key expenditures for sustenance like rent, food and travel, he is able to save around ₹8,000 per month.

A money minded Ramesh wants to take informed decisions about his money. But he doesn't know what to do. His parents, who are conservative investors, ask him to deposit the money in a fixed deposit (FD) account. They stress the value of safety, stability and certain returns, even if those returns grow only modestly. His college friend however feels Ramesh should be investing in equity mutual funds or directly in the stock market. His friend points out that Ramesh is quite young and can afford to take risk, earning high returns in the long run.

This contradictory counsel has Ramesh in a quandary. Complicating his predicament further is the fact that Ramesh has short- and long-term investment objectives. And in the short term, he intends to buy a bike within a year, so he needs cash and fairly liquid investments. Still, he aims to purchase a home in the next 10 years and also plans on ensuring his retirement with disciplined investment.

Ramesh finds himself in a position that requires him to answer a significant financial question: Is it better to then do safe savings, leaving low risk such as home ownership aside for short term security or should one take more risks with investments that have the potential get rich on later? He understands that what he chooses to do today will have a profound impact on his financial future.

### Critical Thinking Question

If you were Ramesh, what would be your financial strategy to balance looking for the liquidity now and wealth creation in the long run? Explain your reasoning including consideration of the concepts of risk, return, inflation, and financial planning.

## 1.1 Nature and Definitions

Savings and investment are functions of financial planning-twins, if you will. Savings are about keeping money safe and liquid for liquidity to any emergency need, whereas the investment puts money in different assets with a desire of capital appreciation. They complement each other as the two facets of security and growth, offering people stability in their lives and wealth in their futures.

### 1.1.1 Definition of Savings

We define saving as that part of income which was not spent immediately, but rather kept back for the future. Unlike investments which seek to store up wealth or compound the capital value, savings are aimed more at maintaining the initial amount of money intact and ensuring it can be readily accessed if needed. People tend to save in low risk high liquidity places such as the savings account, fixed deposits or money kept aside for a rainy day.

The function of these savings is to offer financial security and stability. They protect against life's unexpected surprises, like lost jobs, medical crises or repairs to the house. Furthermore, savings instil the discipline of financial responsibility as saving a fixed fraction of your pay supports disciplined money management. Savings also become the foundation of tomorrow's investments; and, before you diversify into volatile financial instruments such as shares or mutual funds, it is important to build an emergency reservoir of money out of your savings. Hence, savings act as a cushion against the unknown and shield us from future uncertainties by providing stability and an avenue for wealth creation.



- **Security:** Savings balance the security of your money against the need to earn increasingly large returns. Savings and fixed deposits are relatively safe and with little to no risk at all, as opposed to stocks or real estate etc.
- **Liquidity:** Savings can be easily accessed and cashed in without heavy penalties or delays, perfect for emergency financial requirements.
- **Low ROI or Fixed Returns –** Savings rarely earns as high returns as an investment does and that too, fixed or low interest wise. The result we want is that a lot of exposition remains online and available, rather than the most profit.
- **Financial Security Net:** Cash savings are a safety net in uncertain times and bring sense of financial security to the person possessing them. For instance, a rainy day fund may be used to pay for living costs if you don't have a job.

- **Foundation of Investment:** Savings are a stepping stone for financial planning and start of future investments. A safety cushion of savings gives people the freedom to treat riskier, higher-return investments without too much fear.

### 1.1.2 Definition of Investment

It is the commitment of financial resources available in present period to securities or assets so as to derive returns in future as per Risk and Return Criteria. Savings are about safety and liquidity; investments are about growth: putting money into growth opportunities that will pay out over time. The investment decisions can have different shapes, which in general fall under **financial assets like stocks, bonds and mutual funds** or **physical assets like real estate and goods** or infrastructure projects. Investing in these assets allows people and businesses to grow their wealth and increase long-term financial security.

The essential properties of investment are elucidated below:

- **Generation of Return:** Investment is mainly carried out for attaining profitable returns. These returns can appear in various guises — **dividends from stocks, interest from bonds, rental income from real estate** or **capital gains** (selling something for more than you paid). It is investment that makes a big difference than just saving.

- **Risks:** Any investment would always involve some kind of risk, as nobody can be certain about the final outcome. Stock prices in stock markets can be volatile, real estate values may rise and fall like the price of homes; and indeed some bond issuers may default on payments. The risks vary by asset class and should be weighed when allocating assets.

- **Time Horizons:** The focus is on medium- to long-term financial goals when making investments. Typical goals are; retirement, saving for children's education or acquiring property. With more time, investors can smooth out market gyrations and capitalize on the power of compounding.

- **Capital Appreciation:** Most investments offer opportunities for the value of assets to increase. For example, property prices can rise and stocks can grow in value if companies are

growing and making more money. This level of gratitude, is a key foundation for wealth building.

- **Contribution to the Economy:** Owning stocks not only helps investors; it is also an important component of economic growth. Resources in industries, businesses and infrastructure development lead to growth, generation of employment opportunities and promotion of developmental activities.

That is, the investment involves an intentional exchange of current resources for the future gain with a consideration to risk and return trade-off, enabling development on individual as well as economic fronts.

### 1.1.3 Objectives of Saving

The underlying goal of saving money is to have some emergency funds for the future so that you can spend it when necessary. Just about all of the save should be toward safety, security and financial stability. People like to keep some their income for practicality reasons of course but also again, psychologically comforted as knowing there are liquid resources in the event of uncertainty. Savings has so many benefits, all of which are directly or indirectly linked to financial well-being.

- **Emergency Prep:** One of the primary objectives of saving is to build up a fund you can tap into for unplanned expenses. These are things like unexpected medical bills, a job loss or home repairs. Such reserves allow people to weather emergencies without going into debt.
- **Immediate Objectives:** Short-term goals are also fulfilled through savings. These may, for example, entail funding travel expenses or buying a household appliance or an item one has long wanted but can be bought without significant financial planning. Regular savings allows people to meet these targets without stretching themselves financially.
- **Liquidity:** Another primary goal is to make yourself liquid. Liquidity permits savers to withdraw their funds promptly, at no serious cost and risk of loss. This sets savings apart from investments, which can keep your money tied up for extended periods of time.

- **Financial Behavior:** Savings help shape the habits through which people live below their means. Since by saving money regularly, individuals develop good habits of managing money and have better control over spending and better financial security in the long run.
- **Basis for Investment:** Savings serve as the primary source of fund for future investments. Investing in a solid foundation is something that everyone should do, before you start taking risks with your money investing it in stocks, bonds and real estate. I encourage people to be financially prepared if life were to throw any unexpected surprises their way so they can recover from those surprises quickly.

Saving is therefore aimed at developing resilience (e.g. establish a fund for coping with emergency demands) and preparing individuals to engage in more demanding financial practices by improving security as well as discipline.

#### 1.1.4 Objectives of Investing

##### Comprehensive Investment Objectives



The goals of investing are not simply to stay out of harm's way, but rather growth, wealth and freedom. Invest is a process of compering the surplus funds into means of production with expectation in return over short or long period to fetch some returns which cab add wealth over time. Whereas savings focuses on safety and liquidity, investing is about the pursuit of higher returns (through risk taking). When people invest in financial products like stocks, bonds and mutual funds or physical items such as real estate and commodities, they are not only building on their own financial futures but also promoting economic growth.

- **Accumulation of Wealth:** One of the key purposes of investing is to grow capital by having a position in assets that appreciate. For instance, stocks can increase in value as companies expand and real estate value tends to grow over time as it has the potential to add more wealth to an investor's base.
- **Income:** One way investments help is by providing regular income. Stock dividends, bond interest or rental income from real estate yield regular cash flow in addition to someone's main source of income.
- **Retirement Planning:** One key objective of an investment is to lead a comfortable life in old-age without working. If your readers don't mind risk, they could continue to invest during their working years, which would leave them with a pile of money that can be used to last for the rest of their life after those paychecks stop coming in.
- **Outpacing Inflation:** Investments are made with the goal of protecting and increasing purchasing power from returns that exceed the cost-of-living. Investments, unlike savings, won't lose actual value over time and can help guard against inflation's erosive impact on wealth.
- **Meet Financial Goals:** Investments help people to develop funds for their life priorities - education, house or child's marriage. Regular investing allows you to make those large financial commitments without impacting your day to day lives.
- **Tax-Going:** Some Investment species are tax-saving, where individuals can save on their net amount. Tax saving bonds, retirement fund investments or government-backed schemes not only pay you but also reduce your consolidated tax liability.

Investing, then, becomes a form of financial offense, a way to transform assets into potential growth, into income now and in the future, and ultimately into lasting financial security. It is a risk-return mediator and puts people in a position to achieve personal aspirations while also supporting economic growth by enabling money they save to be transferred into businesses and industry.

### 1.1.5 Understanding Risk and Return

Two essential activity parameters for investment decisions are risk and return. Risk is defined as the potential to incur financial loss or experience fluctuation in anticipated earnings, while return is what an investor receives for taking those risks. The concept is simple: Higher potential return investments have higher potential risks, while safe ones have lower but consistent returns. So every investor must consider this trade-off relative to his or her financial objectives and time horizon as well as risk tolerance.

There are different variations of risk and they impact results in different manner.

- **Market Risk** – This is a risk that arises due to changes in variable of certain types i.e.: stock price, interest rate and foreign exchange rates. Investors who are sensitive to market fluctuations may experience large positive or negative short-term returns based on the state of the economy.
- **Credit:** The risk that a borrower will renege on its debts. It is particularly applicable in bonds or loans, since default on interest or principal payments constitutes a loss to the investor.
- **Liquidity Risk:** The risk to convert an asset into cash rapidly without experiencing a significant loss. Liquidity risk is typically greater for investments in assets such as real estate or thinly traded securities.
- **Inflation Risk:** This decreases the real value of returns in future and inflation eats money purchasing power. But if even fixed returns from safe instruments can become meaningless, that is higher inflation.

Returns, in the meantime, can also come in several forms according to what kind of investment it is.

- **Fixed Returns:** These are returns that can be estimated, they don't vary too much, and are often seen in less volatile instruments like government securities, fixed deposits or treasury bills.

- **Variable Returns:** They change with the market; they are typical of stocks, mutual funds and real estate. The real results are highly dependent on economic and market conditions.
- **Capital Gains:** Investors may also earn a return when they sell an asset, like a stock or property, for more than they bought it.
- **Recurring cash flow:** Dividends from shares, rental income from property or interest charged on debt are regular forms of cash exchange for investors.

Risk management is an integral component of financial planning. Standard investors would always prefer safer fixed returns accepting lower prize for security. On the other extreme, there are aggressive investors who take on more risk for higher returns. In practice, many investors strive for a diversified approach where funds are invested across multiple asset classes in order to spread risk (while hoping not to lose sight of the potential for stable and consistent returns).

### Did You Know?

“The principle of risk and return suggests that investors are rewarded for taking on higher levels of uncertainty. Historically, equities have provided higher average returns compared to fixed deposits, but they also exhibit greater volatility, making them unsuitable for short-term needs.”

## 1.2 Key Differences Between Saving and Investing

Savings and investments are two similar sounding financial activities, but quite contrarily to the common belief, they are fundamentally different concerning nature, purpose, instruments used, and their effects on an individual's financial life. Savings tend to be about safety, security, and liquidity; investments are more about growth, wealth development and long-term financial independence. These distinctions are more striking when considered in terms of time horizon, liquidity, safety and instruments, as well as your role in financial planning.

### 1.2.1 Time Horizon: Short-term vs Long-term

The key distinction between saving and investing ultimately boils down to time horizon. Savings is basically short-term money and Investments are long term future gains. The term of the investment determines, not only where one should invest, but also to what extent they're willing to take a risk.

Intentional ways to save Saving may be driven primarily based on short term reasons. The money that people have saved for emergencies, or a down payment on a mortgage or travel, has to come from somewhere. Since these are short-term goals, the focus is to ensure accessibility and security. An instrument like that of savings accounts, fixed deposits or recurring deposits are designed to cater for such requirements as funds can be withdrawn easily and without any loss in value.

Investments, in contrast, are linked to long-term goals. People put money into stocks, mutual funds or property with a time frame that could be anywhere from five to 30 years. The concept is that you allow money to grow over time through compounding and market appreciation. 2. Because long-term goals like retirement planning, buying a home and children's education need big money In such situation investments is the best option to fulfil them.

The varying horizon reflects differing tolerance to risk. Only short-term savings are risk-free in that market changes could endanger the need for funds. On the other hand, investments can survive volatility, as short-term declines could be substituted with long-term gains. This is why you're supposed to be as aggressive with your investments as possible when you are young, and why as retirement approaches people transition their focus towards safer savings.

Additional points of distinction include:

- Emergency preparedness: Savings are for accessing quickly in case of urgent need.
- Compound benefits: Investments are used to compound the time horizon for returns — especially when they can be reinvested over decades.

- Alignment of goals: Savings are more appropriate for immediate consumption goals whereas investments are aligned to wealth- creation and life cycle needs.

To sum it up, one's time horizon dictates whether one will save money for immediate security or invest it for potential long-term financial freedom.

### 1.2.2 Liquidity and Accessibility

One major difference between saving and investing is the level of liquidity and access. Liquidity is defined as the speed with which an asset can be sold or traded for cash (without incurring a substantial loss in value), while accessibility refers to the ability of saved and invested funds to be "used" effectively when they are wanted for this purpose. These two lenses are important to consider when assessing whether the funds are a good fit for short-term needs or long-term financial objectives.

It is so that you can easily access and are very liquid, by design. Funds in the savings are or cash reserves can be withdrawn almost instantly to provide for immediate financial needs. While instruments like fixed and recurring deposits, are somewhat less liquid, they have reasonable liquidity availability, that is to say with a little bit of penalty one can withdraw the money early. At its most basic, the purpose of saving is to have money to hand for everyday expenses and unexpected crises.

Investment As against this, investments may have a wide range of liquidity characteristics depending on the type of asset. For instance:

- Stock and Mutual Fund: These investments can be sold fast in the capital markets but the selling price is affected by the market trends, so one could lose their value when there are falling trends.
- Real Estate: This asset class is very illiquid – it takes months to sell a property and requires all sorts of legal paperwork, not to mention ensuring the local real estate market is hot enough.

- **Bonds and Retirement Funds:** Specific bonds or retirement plans may have a lock-in period, which means such funds are not available until the end of term, reducing overall flexibility.

The difference is more apparent in real-world scenarios. For instance, when you have a fresh medical bill that needs to be paid in short order, your savings can be used almost instantly since they are so liquid and available. A withdrawal from an investment at such time could erode the potential for market loss of value as well. For long-term wealth creation, on the other hand, you have to accept that investment isn't liquid and let it not be so because over a longer time frame investments offer better returns.

Just a couple of other points that highlight this distinction further:

- **Penalty Fees:** While penalty charges can be extracted on money saved in accounts, they barely compare with the risk of being wiped out from liquidating investments at a bad time in the market.
- **Flexibility:** External savings accounts are flexible, with no restriction on how often funds can be deposited or withdrawn, as opposed to investments that require discipline to stick it out for the necessary duration.

**Emergency Preparedness: Savings** It's often advised by financial advisors to maintain an emergency fund in savings, as investments come with restrictions and may carry principal risk or loss.

The distinction between liquidity and accessibility highlights how savings and investments complement each other as elements of financial planning: Savings are for the "now" (i.e., they're liquid), while investments work to create wealth over time.

### 1.2.3 Safety vs Growth Potential

The difference between saving and investing is also well-demonstrated in the tradeoff of safety and growth. Savings are designed to protect principal, thus keeping the one-to-one match safe from decline. In contrast, investments are implemented with the purpose of

achieving growth and although taking risks is unavoidable, these are taken for a higher projected return. This tension is central to financial decision making, and the trade-off itself represents a key dilemma for people: whether they prefer certainty and stability or are willing to take risks in the hope of maximizing wealth.

Savers especially like savings instruments. Bank deposits, FDs, and Government securities based accounts are aimed at reducing the risk of capital erosion. They provide guaranteed returns — albeit paltry at the moment — but these low yields are accompanied by a promise to keep the principal amount safe. For example, a fixed deposit promises the principal and a fixed rate of interest thus offering safety and even predict-ability. This becomes particularly beneficial when it comes to short-term needs or where certainty is a must.

Compare this with investments, which are inherently sexy: they're about growing. Equity shares, mutual funds, real estate all do not have returns as an option, but they promise you at best a potential for capital appreciation or steady income stream in the form of dividends or rent. Higher returns are only available through higher risk, be it market declines, defaults or price volatility. Although financial markets offer the potential for outpacing inflation and generating long-term wealth, they require a tolerance for up-and-down swings and ambiguity.

The tension between safety and the ability to grow also changes depending on what stage of life you are in. Younger investors are frequently counseled to weigh growth-oriented investments more heavily due to their longer time to recover from market swings and take better advantage of compounding. For older investors, especially those near retirement age, security takes the front seat here as they would want to protect years of saving rather than grow at an aggressive rate.

Other considerations further emphasize this contrast:

- **Inflation Impact:** Whatever savings reaches bank, it is safe but it might not be enough when the family gets back due to inflation. However, investments can provide returns that outpace inflation.
- **Volatility:** An investment in the Fund involves risk, and you could lose money on your investment in the Fund (i.e., the value of your investment will go down). But in the grand

scheme of things, this volatility has a way of translating into greater returns than if you were to avoid it—at least over time.

- **Diversification:** As part of a sound financial strategy, investors should have both safe money and opportunity money. It enables us to hedge our wealth in part and seek higher returns at the same time.

This distinction between safety and growth potential illustrates the complementary roles of saving and investing, one of which serves to preserve capital while the other looks to multiply it by taking on risk.

#### 1.2.4 Instruments : Saving accounts VS Stocks, Bonds, Mutual funds

The palette of instruments that one may use for savings and investment illustrates the fundamental contrast in purpose, risk capacity and medium to long term suitability. Schemes of saving are programmed to ensure safety, stability and liquidity (as per need), whereas investment plans aim at achieving higher levels of returns by inviting a calibrated risk over long-term growth. The choice between the two will depend on your financial goals, time horizon and risk tolerance.

Savings themselves are concentrated in low-risk and fixed-return products. The most obvious of these is your Savings Account; it's safe, liquid and will earn you next to nothing in the way of returns. Other types are Fixed Deposits wherein money is locked for a pre-determined period with assured returns, Recurring Deposits which facilitate small regular contributions and still provide protection of capital. Bank Savings and EO, Post-office Savings Schemes are part of such types of investments.

providing confidence and security as backed by either banks or government. These vehicles are ideal for short-term needs and investors with a low risk tolerance, for they ensure the capital is protected.

Investments, though, are a lot more than one of these individual securities, each with its own level of risk and potential return.

- **Stocks:** These are equity ownership in companies and offer opportunities for capital growth as well as dividends. And while they can make big returns, they also carry significant market risk.
- **Bonds:** Entail lending money to corporations, or in the case of governments, with the promise of fixed interest payments and that your principal will be recovered at a set date. Bonds, which are believed to be generally less volatile than stocks, have their own set of risks, including default and interest rates.
- **Mutual Funds:** A way to pool contributions from many investors and are managed by professionals. They provide diversification to different types of assets, which should decrease specific risk, but the return is then dependent on the overall performance of the market.
- **Real Estate:** Offers both capital gains and future rental income. However, it is often capital intensive and carries ongoing expense, but typically offers lower liquidity as the cost of selling property based investments is higher in comparison to the sale of shares or other securities.

Savings vs. investment instruments Additionally, savings and investment instruments vary in several important ways:

- **Regulation:** Savings accounts, fixed deposits and the like are usually insured by central banks or other government agency thereby offering protection to depositors. Investment instruments like stocks and mutual funds do not come with such an assurance as returns are influenced by the market.
- **Accessibility:** Savings products come with the facility of frequent deposits and withdraw, and have minimal restrictions making them a suitable option for managing cash needs in the short term. On the other hand your money is locked, or you would rather hold for long term on most investment instruments.
- **Return Variability:** Fixed return is earned by savings instruments and variable returns that could be high during uptrend and low (negative) during downtrend.

It is a tale of two instruments: with the differing tools illustrating the stark choice between guaranteed stability, on the one hand, and pursuing wealth by taking prudent risk on the other.

### 1.2.5 Role in Personal Financial Planning

Personal financial planning is the continuous process of managing an individual's personal finances in a manner appropriating to his life's stage, objectives and resources. In this balanced system, savings and investments play separate but related roles tied together to form an integrated financial plan. Savings are about protecting capital and preserving liquidity; investments are about creating wealth and achieving financial independence. Both are vital factors for a sound financial plan, and integration of these two shall determine the financial stability at different phase in life.

1.2 The role played by saving in financing personal financial planning The base to personal financial planning is provided by saving that gives immediate protection against contingencies. They provide a cushion against emergencies, daily needs and short-term plans without subjecting people to undue financial pressure. For example, an Emergency Fund (usually comprised of savings) is considered a first step in any comprehensive financial plan. This fund helps people address emergencies such as a sudden medical expense, loss of job or repairs without turning to costly borrowing. Apart from the protection that saving brings along, it promotes financial rectitude- when people get into the culture of postponing consumption by consistently taking away some proportion of their income before they spend, such act instills discipline and lowers impulsive consumption.

Investments, however, are the workhorse of financial planning. By placing money in stocks, bonds, mutual funds or real estate, the value of a person's investments can grow faster than inflation -- and wealth grows over time. Investing is crucial in achieving long-term financial objectives such as purchasing a home, sending kids to college and retirement. As an added bonus, it's a hedge against inflation -v something which will hold real value rather than lose purchasing power over time. If you want to achieve financial independence, then investments are what you need, they generate income and even growth that you can use when the future beckons.

The point of financial planning isn't to pick sides between saving or investing, but rather to use them together in the right way. A strategy limited to savings could provide some amount of safety and liquidity but would lack the ability to produce growth, thereby preventing

people from addressing long-term goals or mitigating against inflation. On the other hand, a plan that relies on investments alone puts participants at risk and it is an inconvenient option during emergencies. So it is with your financial future and that of your family; hence, the best advisors stress diversification (using not only savings but investments as well) in order to achieve a mix of security (as well as safety) and growth.

The key aspects of such embedding are:

**Emergency Fund:** Most financial planning begins with saving to cover unforeseen, one-off expenses or emergencies. If they don't have this cushion of protection, assets could be sold before it is in the investor's best interest.

- **Goal Focused:** Investments are made with specific long-term goals in mind, like retirement, education of children or buying a house and financial strategies are structured around personal life goals.

- **Protection:** A mix of saving and investing helps to minimise the risk from sudden events. Savings absorb short-term shocks while investments create long-term resources and prosperity.

- **Life Cycle Requirements:** The savings and investment are not static over the life of a person. When you are younger, with longer time horizons, growth should take precedence in your investment strategy — as opposed to when you're older and closer to retirement, when savings will be more heavily focused on preserving capital.

Therefore, personal financial planning must have a double emphasis. Savings are the armor of liquidity and certainty; investments are the road to growth and future riches. ### ALM/DR strategy They jointly constitute a robust and dynamic way for the plan sponsor to address current cash requirements and future wealth creation aspirations, offering both protection against risks as well as support of ambitions throughout the cycle of life.

### 1.3 Importance of Investments in Wealth Creation

**Investing** A focus on investing is the key to financial growth and lasting wealth. Savings provide stability and liquidity, while investments are the vehicles that allow people to grow

their wealth over time. By means of compounding, real assets protection against inflation, diversification opportunities retirement planning and passive income generation, investments helps to leverage scarce resources into appreciable quantum of money.

### 1.3.1 Compounding and Long-term Wealth Accumulation

The power of compounding is one of the great forces behind long-term investing. Compounding is when the returns earned from an investment are reinvested, and those reinvested returns also earn their own returns in subsequent periods. This creates a snowball over time

When wealth grows not just on the initial capital, but also on the gains reinvested. It's this self-reinforcing cycle that makes long-term investing so much more rewarding than short-term saving.

Compounding in long-term investing greatly favors patience and consistence. When left to accumulate over the years—even as few as 10 or 20—small, regular investments can snowball into large amounts. For instance, if a person invests ₹5,000 every month in a mutual fund which gives average of 10% annual return after 20 years the corpus will become around ₹38 Lakhs. If you extend the investment period to 30 years, the total corpus will be a little over ₹1.14 crore. So What's the Difference?The huge gap between after 20 years and 30 years demonstrates what is known as compounding at work—the longer that money stays put, the more oomph it has.

The importance of compounding in the creation of wealth can be demonstrated by the following factors:

- **Early Start Benefit:** Investing early, even modest amounts can be compounded over time — and the more compound interest work, the better returns will be multiplied. For example, if you are investing ₹2,000 every month for 3 decades from the age of 25 to 55 earning at a rate of 10%, then we can clearly see that it becomes close to ₹41 lakhs. However, had the same person waited till 35 and invested for a period of 20 years the corpus would be only ₹15 lakhs. Another 10 years adds almost three times the wealth, which is why time is the most important variable in compounding.

- Consistency: Consistent, disciplined saving goes a long way for compounding. Mutual Funds' SIP (Systematic Investment Plan) is an example of disciplined investment for strong base over a period of time, like little drops make the mighty ocean. Regular investing adds up over time for steady growth.
- Compounding – Reinvesting dividends, interest or capital gains rather than taking the money allows the process to continue without interruption. For instance, a stock that returns dividends annually can pay the shareholder in cash or allow him to reinvest the dividends and buy more of its shares. The purpose of reinvesting is to allow each return make another future growth addition.

Compounding is especially effective however, when dealing with instruments such as stocks, mutual funds and IRAs where returns fluctuate but have historically moved upwards over time. The effect of compounding is exponential and when invested in companies with wide moats those who keep patience reap the biggest rewards over time - especially given compounding.

So, compound is not just any mathematical formula but 'Financial Growth Rock'. Insights: An early start, disciplined investing and reinvestment of returns enabled individuals to turn small amounts into great wealth over long periods, thus investments are much more powerful vehicles for accumulation of wealth than the savings.

### 1.3.2 Beating Inflation

Price inflation refers to a general rise in prices measured against a standard level of purchasing power. Put simply, with inflation higher, the same amount of money buys less in goods and services. If people have nothing but savings instruments, like bank deposits or cash reserves — investments that generally pay low, steady fixed interest — their wealth can erode in real terms as inflation ticks higher. Accordingly, while the nominal amount of savings is increasing: the real value of those savings declines. The return in real terms will be negative if the average inflation rate is equal to 6% and the interest rate derived from savings account is 4%, because  $-2\%$  means you left with less money inside your pocket after accounting for value erosion through time.

Enter the investment landscape. Unlike accumulated savings, investments allow you to make returns that equal – and outweigh – inflation. Investing in the stock market, mutual funds, real estate or other growth assets can offer long-term returns that both protect and grow your wealth. Equity markets and diversified funds have generated returns of 10-12% on an average per annum in the past, which are adequate to beat inflation. Real estate can also appreciate over many years, giving you capital growth and income. These inflation-busting features render investments as essential in long-term financial planning.

The following describes the variety in which investments provide a defense against inflation:

- **Capital Appreciation:** Stocks, mutual funds or property go up over time. It is this accretion, which compensates for the loss in buying power from inflation and that keeps wealth vibrant for future transactions.
- **Real Returns:** Higher-yielding investments offer positive real returns (as opposed to savings instruments that give fixed interest at rates which could be below inflation). For example, a stock market portfolio that returns 12% when inflation is 6% offers a gain of 6% in real terms, building long-term wealth.
- **Preservation of wealth:** It is not just about growth, but lock-keeping! By keeping returns ahead of inflation, investments help preserve the purchasing power of money and may help with people's goals, be it building a nest egg or purchasing a home, without funds losing value over time.

In the long-term financial planning world, such as retirement, outguessing inflation is about survival than growth. In the absence of inflation-protected returns, retirees might find that the amount they've accumulated over their careers will fall short because living expenses will still go up. Investments therefore serve as

protection from inflation to help maintain wealth in real terms and support financial independence into the future.

### 1.3.3 Portfolio Diversification and Asset Allocation

In personal financial planning and wealth management, both portfolio diversification and asset allocation are critical to the operation of wealth creation in terms of stability, performance, and sustainability. While the two are highly correlated, differentiation is used to lower risk by spreading funds in different options and asset allocation refers to strategically investing your money across different types of assets considering one's investment goals, risk tolerance and time period. They are essential, together they build a foundation for those who have the foresight to plan for how to invest their money wisely, allowing them to reach their goals in finance and reduce exposure to avoidable risks.

**Diversification** Diversification is underpinned by the concept that various assets do not all move together or act alike in specific market environments. By diversifying your holdings amongst various asset classes, sectors and geographical regions like equities, bonds, real estate and commodities you can prevent the consequences of poor performance in any one area. For instance, in case of a stock market downturn, equities may fall but the value of government bonds or gold can hold steady or increase, so as to offset at least part of the loss. This is why diversification which spreads the risk makes sense and minimizes potential large losses.

- **Risk mitigation:** Diversification's biggest advantage is that if one asset class takes a hit, another might compensate. That balancing act reduces the portfolio's volatility. Indeed, an investor who is 100% equity has the potential to lose a great deal post-market-crash value of his investment. But if the investor also owns bonds, real estate or gold, then the equities losses would be offset by holding steady in the other assets or even gaining value.
- **Stability:** If you invest in a spread of assets, the likelihood for dramatic swings is reduced as the return on several assets works to moderate those returns. This stability enables investors to stay true to their long-term financial objectives without getting rattled by temporary market gyrating.
- **Sector and region exposure:** A successful strategy comes from not only diversifying the assets but spreading the investment across various industries and regions. Like, people investing in technology stocks only will be risky as the sector might suffer from regulatory changes. A diversified portfolio would also have exposure to the healthcare or consumer goods/infrastructure sectors, and domestic as well as overseas markets.

Asset allocation, in contrast, is the positioning of an individual's pool of money across various asset classes. This decision is informed by age, income, tolerance for risk and financial goals. You can have more risk at play (read: you can put a higher percentage of the funds in the stock market), and if you're relatively young (in your 20s or 30s) and are investing for long-term gain, it's likely that your portfolio will look very different from someone who is closer to retirement. If you are an older investor who is about to retire, you are likely to focus more on protecting the capital and choose something safer like bonds, fixed deposits or annuities.

- **Flexibility:** Portfolios can be tailored to the individual needs of investors through asset allocation. For instance, a middle-aged investor saving for a child's college education 10 years down the road would mix stocks to provide growth and bonds to provide stability so that money is available at the right time.
- **TIME HORIZON AND RISK TOLERANCE:** Investors with a longer time horizon aren't so worried about short-term volatility, which can make equities appropriate. For people with shorter time horizons or low risk tolerance, however, there are safer assets that they can and should use to protect their near-term cash flow needs.
- **Changing Up:** AA is not static. Investors need to rebalance their portfolios as financial goals, life stages, or economic variables change. One relatively well-known example of a reallocation strategy is transferring some investment in equities to bonds as retirement approaches, which helps to protect the assets that have been built up.

The magic of diversification and asset allocation together is profound. Whereas diversification reduces unsystematic risk by holding a variety of investments, asset allocation ensures the portfolio is positioned to meet the investor's stated goals and tolerance for risk. Diversification doesn't ensure gains, but it does reduce the likelihood of extreme losses. The proper allocation of assets also serves to maintain the proper level of risk and return given an investor's circumstances.

They serve a dual purpose in the larger story of wealth creation: they protect against wild, unforeseeable shocks while allowing for calmer growth over time. An investor who forgets about diversification and asset allocation can be taking on too much risk or passing up potential gains. Thus a suitably constructed portfolio—adequately diversified across asset classes, sectors and geographies and intelligently allocated to meet personal objectives—is the bedrock of financial success over time.

### 1.3.4 Building Financial Security and Retirement Corpus

Among its many uses, investments are a crucial tool to construct long-term financial security and establish a secure retirement nest egg. Active income is generated by an individual from the time they are working.

employment, profession, or business. This is your money for the day to day living and saving and investing. Why then, if they have so much to spend down for 30 years or more in retirement, is it a terrible tax strategy as soon as they start taking the RMDs? This is where the significance of disciplined investing comes in, because counting only on savings that are saving you don't get in this new era is seldom adequate to meet financial needs at a later age. Products such as savings instruments give fixed returns and limited which may become insufficient to combat upsurging inflation or take care of increasing expenses, namely healthcare costs.

However, investments help them grow a huge retirement corpus by investing in growth oriented products consistently for a long while. Things like IRA's, retirement accounts, mutual funds, stocks and pensions grow in value over time through the magic of compound interest and reinvestment. Staying invested over decades means even small, regular contributions to one's scheme can become a contribution to real wealth and financial independence in their post-retirement life.

The connotation of investments in retirement planning can be simplified as follows:

- **Growth Of Wealth:** Over time, small amounts grow into a substantial sum. For instance, a person investing ₹10,000 every month in MF and earning an average return of 10% can amass almost ₹2.3 crore in 30 years. It shows how adhering to a strategy, staying the course harsh as that may sound -- can lead to financial security.
- **Income Security:** Some retirement assets—such as annuities, pension plans or dividend-paying funds—offer ongoing income. These income sources replace active income and help a person to sustain their living expenses per month and so remain financially independent even in retirement.

- **Inflation:** The value of money decreases over time as prices of goods and services generally go up. A fixed deposit that earns 5% a year may appear safe, but if inflation is running at an average rate of 6%, the investor's real return would be negative. The other types of investment like stocks, mutual funds or real estate typically increases more than inflation and protects the principal and purchase power in retirement.

- **Medical Preparedness:** The biggest money issue in old age is rising medical costs. Medical expenses tend to rise faster than inflation, requiring substantial retirement savings. Investments act as a financial cushion during such times to help you manage these expenses, without drawing on savings early.

Creating retirement security takes long-term planning, discipline and making the right decisions at the right time. Starting young is especially powerful, since the effect of compounding has had more years to magnify returns. For example, someone who starts investing at 25 will retire with a lot more than someone who waits until age 40.

even if the pair are paying in the same money each month. Monthly contributions through SIPs or retirement solutions also keeps the exercise smooth and less taxing on your cash flows as, investments made in small doses at regular intervals are easier to manage compared with one-time large investment.

Approaching retirement, asset allocation becomes just as important. Youthful investors can get away with holding higher expositions to equities to capture growth, but people closer to retirement need to steer incrementally toward lower-risk assets such as bonds or annuities. This balance maintains the retirement corpus, which in turn keeps spinning out returns to spend.

Finally, investments do more than grow money; they guarantee peace and dignity in retirement. With a large retirement corpus, individuals can secure their independence and not be dependent on their family or other help for financial assistance, at the same time ensure to live life as needed. Investments are the highway between the years of active earning and a retirement that is secure, comfortable, and self-sustaining.

### 1.3.5 Creating Passive Income Streams

Among the many valuable functions of investments, few can compare to its capacity to produce passive income – that is, income generated with little or no direct effort. Unlike salaries or professional earnings/biz profits that require time and effort, passive income streams don't work when you are not working. This aspect has made passive income a key to financial freedom, as people can continue making money while engaging in other activities, following their hobbies or even getting ready for retirement.

There are many investment vehicles that can provide passive income opportunities with different advantages and risks.

- **Dividend-paying stocks:** Shareholders receive regular payouts from a company's earnings. Dividends provide a stable stream of cash flow and can increase in value as stock prices grow. Dividends are also a reliable source of cash flow for investors in stable, blue-chip companies.
- **Income from real estate rentals:** Owning an asset in the form of property provides a regular monthly or annual income through rent. Plus, real estate can increase in value over the years, providing steady income as well as long-term growth. Although becoming an instigator in real estate demands more capital compared to dividend-paying stocks, it offers a stable income stream which contributes positively on the passive income.
- **Bonds and fixed-income securities:** These very stable instruments have known returns on them that pay interest at regular intervals, allowing predictable income that carries low investment risk. For an investor looking for stability and predictability, corporate bonds, government securities, and debentures are ideally well placed.
- **Mutual funds with income choices:** Some mutual funds pay out earnings periodically, via dividends or interest from the underlying holdings. This provides investors with exposure to professionally managed funds and the possibility of receiving regular distributions.

The power of passive income is that it provides you with income in addition to, or in some cases, instead of active work-based money. For people who work, it represents another form of capital that can be reinvested to expedite wealth creation. If you are retired passive income becomes very pertinent as it still helps continue the flow of money when you are no longer employed. It decreases reliance on a single source of money, putting financial life on more

stable and firm ground. Passive income can be a financial cushion during job loss, illness or business decline.

Create Multiple Passive income streams The advantages of building passive income flows are clear.

Independence: Passive income allows to keep your desired way of life without being connected to the full-time job. One who earns enough from investments can retire early to do what he loves – or not work as hard.

- **Wealth Accumulation:** If the passive income is saved and invested rather than spent, it speeds up the power of compounding. For example, you can reinvest dividends from stocks or rental income earned by real estate back into new investments and multiply the effects they have on long-term wealth.

- **Risk Reduction:** The more variety of passive income streams one has, the less exposure to financial risk. If one income source falters, the others support you. For instance, an investor having both rental income and bond interest is better off than one who only relies on employment.

You are absolutely right about the discipline, capital allocation and patience required to build a source of passive income. The income may begin small, however with time it begins to compound as you make more investments and the returns are reinvested, and can add up to quite a bit of financial security. By effectively buttressing these income streams one by one and having them cover your basic needs, wants and everything else along the way) it ensures stability in the present and future; greater protection against surprises (good or bad); as well as more independence in your financial decision making.

In other words, investment income isnt just more money to bring in the door. It's a strategic journey towards life-long financial freedom WHICH gives you safety-nets, liberation and it also opens the flood-gates of wealth that is handed down from generation to generation.

**Knowledge Check 1**

Choose correct options:

1. Which principle helps small investments grow into large sums over time?
  - a) Liquidity
  - b) Compounding
  - c) Diversification
  - d) Accessibility
  
2. What is the main reason investments are necessary to beat inflation?
  - a) Fixed interest
  - b) Guaranteed safety
  - c) Higher returns
  - d) Easy access
  
3. Which of the following reduces overall portfolio risk?
  - a) Single stock
  - b) Cash holding
  - c) Diversification
  - d) Fixed deposit
  
4. What is the key financial objective of building a retirement corpus?
  - a) Immediate liquidity
  - b) Post-retirement security
  - c) Tax saving
  - d) Emergency fund

5. Which investment option is most commonly associated with passive income?
- Mutual funds
  - Real estate
  - Insurance
  - Gold

#### 1.4 Role of Investments in Economic Growth

We don't only need to invest in ourselves to make the world a healthier, happier place. Investments being steered into production, creation of capital assets, employment generation and financial markets form the basis for economic development. They improve productivity, drive innovation and raise living standards. The next sub-sections detail how investments lead to growth in many respects.

##### 1.4.1 Channeling Funds into Productive Sectors

One of the important functions of investment in development is to direct surplus funds towards productive fields in an economy. Absent investment, excess savings would sit idle in nonproductive outlets--say, stuffed mattresses and hoarded cash; we wouldn't get all that much extra progress in national capital formation. These savings are turned into productive capital and they are put to work in factories, on the farm, in infrastructure and technology.

In a contemporary economy, the financial system serves as an intermediary between savers and investors. Savings from households and institutions are collected by banks, mutual funds, insurance companies and stock markets then channeled into businesses and development projects. For instance, banks lend out the deposits they gather; mutual funds pool money from individuals to buy stocks and bonds. This process is intended to ensure that money goes to places where it can spur economic activity.

Investing money in productive parts of the economy has several advantages such as:

- **Industrial expansion:** The production sector grows, benefiting from increased access to the capital that is needed for machinery, technological developments and research.
- **Modernization in agriculture:** Investments in irrigation, fertilizers, and equipment that boost agricultural productivity.

**Expanded services companies:** IT, finance, health and education-based businesses can be relatively quickly added to with investment capital.

- **Technological innovation:** Technologies are mainly research-driven and funded by investments, and thus promote innovation and competition.

Such reallocation of resources from non-productive to productive sectors will not only boost economic activity but also the most efficient use of resources. This is the process needed for development sustainability as it links household savings with national priorities and development goals.

#### 1.4.2 Capital Formation and Infrastructure Development

Investments add to capital accumulation — the stock of physical and financial capital required for development. Capital is created by allocating resources to produce long-term assets such as factories, machinery, railroads, and energy facilities. These assets are the foundation of production and economic growth.

The most notable impact of investments is visible in infrastructure development. Huge capital expenditure on roads, railways, ports, airports and power stations provides the infrastructure industries need to run smoothly. Productivity and competitiveness depends much on infrastructure, the lack of which constrains economic activities. Investing in infrastructure not only feeds industrialisation but also is a conduit to market access, domestic and international.

Capital formation is also important for technological progress. Productivity is enhanced and costs and quality are improved by investments in modern equipment or process. This enables sectors to effectively compete in the international market leading to increase in export and dollar earning.

Key elements of capital formation and infrastructure investment include:

- Increased productive capacity: Investments boost the economy's ability to produce goods and services.
- Enhanced effectiveness: Infrastructure lowers transaction expenditures and improves use of resources.
- Regional Development: Investments in infrastructure help bring about an even growth pattern as they integrate less advanced areas with the major economic hubs.
- Foreign investment focus: A strong infrastructure base also attracts MNC and FDI (foreign direct investment).

In that sense, investment—whether in infrastructure or capital—invests in the future and generates a sustainable and inclusive economic growth.

#### 1.4.3 Job Creation and Income Generation

One of the primary mechanisms through which investments contributes to growth is via employment and income. The investment in productive sectors will lead to the increasing of business which will result in other businesses and industries being set up. This growth generates labour demand at all echelons of skill, work for the rural and urban areas.

There are direct and indirect paths to generating jobs. First, investments in industries mean hiring workers for production, management and operations. Indirectly, these new industries trigger complementary activities including logistics, supply chain, retail and services that also demand workers. For example, when investment is made in auto manufacturing, jobs are created not just in factories but also at parts suppliers, dealers and repair shops.

Another positive end result is the income being generated. Employment leads to higher incomes, stimulating both consumption and savings. Greater consumption stimulates demand for goods and services, further stimulating investment, which begins a spiral of growth. Higher income levels are also key to poverty reduction and better quality of life.

Investments into job generation are already visible in a few areas:

- Infrastructure projects: Major construction projects produce millions of jobs for engineers, laborers and people in service professions.
- Tech: Investments in IT and digital companies bring jobs for talent.
- Agriculture: Investment-driven modernization increases productivity and preserves rural employment.
- Entrepreneurship: Investment in start-ups and small businesses to foster self-employment and innovation.

Investments, by creating employment and generating income, also benefit the community as well as a nation's overall economic welfare and growth.

#### 1.4.4 Development of Financial Markets

Investments are also transformative in the light of the financial markets development. The financial markets offer a mechanism by which this savings is brought into productive use. The growth of

investments generates the call for efficient, transparent and diversified financial systems, resulting in increased number of stock exchange, bond market, mutual funds and derivative instruments.

The more actors and organizations that invest, the deeper and wider financial markets become. Greater trading in exchanges promotes liquidity and contributes to the efficiency of price discovery. When governments and companies issue securities to raise funds for projects, bond markets grow. Mutual funds and insurance products diversify investment channels to a wider group of investors.

An advanced financial system brings about a wide range of benefits:

- Allocation of capital: Capital markets efficiently allocate capital from savers to borrowers.

- Risk management: Derivatives and other instruments can allow the investor to manage risks.
- Innovation: Creating a new investment product inspires financial innovation and emergence of specialized markets.
- Transparency and oversight: Broader markets foster better governance, regulation and investor protection.

For economic development, a sound financial market is critical as it facilitates transfer of funds from sector to sector leading to productivity and stability. Furthermore, advanced financial markets encourage inflows of foreign capital and stimulate domestic economic activities.

#### 1.4.5 Increasing National Savings and Investment Rates

At the macroeconomic level, investment is associated with fostering higher levels of national savings and aggregate rates of investment, key measures of economic well-being. An increased savings rate means that households and institutions are saving a larger percentage of income, and these funds can be used for productive investment.

Savings should be reinvested, so that more people are attracted to save and invest instead of simply spend. As savings turn into investment, capital formation rises which promotes industrial growth, innovation and infrastructure of course. This forms a virtuous circle in which savings drive investment and investment drives higher incomes that feed more savings.

The relation between the savings, investment and economic growth may be described as follows:

- Savings by households: Families deposit money in banks, invest in bonds or participate in mutual funds — all of which becomes capital for businesses.
- Institutional savings: This is when corporations reinvest profits for expansion; pension funds and insurance companies channel massive capital into the financial markets.
- Government savings: Government put money aside in form of budget surpluses, and sovereign wealth funds for investment in infrastructure and development projects.

A higher national savings rate and a higher national investment rate are associated with faster economic growth. Nations that are able to trigger mobilisation of the domestic savings and add flow of foreign capital set themselves on a higher plank of growth. Hence, nobody just only becomes richer through investments; but rather nations become more economically stable.

Students investigate how investment in the various sectors contributes to economic growth. Split the class into small groups, one for each industry (agriculture, manufacturing, services and infrastructure), for example. Each group will investigate and report how investment into

their sector flows funds to production, jobs and national growth. The activity will assist students to link the role of investment with macroeconomic achievements and understand that sectors are dependent on each other as well as a strong national performance.

### 1.5 Summary

⊖ Personal finance is based on two basic tenets savings and investments, where savings provide for security as well as liquidity and investment aims at wealth generation and appreciation.

⊖ Savings are short-term in timing, normally kept in safe and liquid stromens as saving bank a/cs; fixed deposits or cash reserves.

⊖ Investments refer to the process of intending money in financial or physical assets such as stocks, bonds, mutual funds and real estate in anticipation of better returns.

⊖ Purposes of savings are for emergency preparedness, liquidity, short term goals and to support future investments.

⊖ Objectives of Investing: These are wealth building, enhancement of capital, inflation overhauling, provision for retirement and replacement income generation.

⊖ One of the fundamental differences between saving and investing is the balance of risk and return: "Savings" priorities on capital preservation, while "Investment" focuses on growth.

⊖ The risk-return trade think underpins financial decision-making, and  $\Rightarrow$  an increase in the potential return of a security will be required in order for a higher level of investment risk to be accepted.

⊖ Investments are crucial for wealth generation in terms of compounding, diversification, creating a steady source of income and building retirement kitty.

⊖ Macroeconomically, investment channels funds into the production of productive assets giving rise to capital formation, infrastructure development, employment generation and financial market expansion.

⊖ Under the explanation of 2.1 investment stimulates economic growth, it can be argued that investment com pressions breaks up the practice mentioned herein above.

⊖ A proper approach to financial planning involves both saving for the short term and investing in long-term success.

### 1.6 Key Terms

Savings – The preparation of wealth for future use; a reduction in spending.

Investing – Committing money into an asset in the hopes of earning a profit or appreciation.

Liquidity – The ability to turn assets into cash with out loss.

Risk – The potential for a decline in value and financial loss or uncertainty of return on an investment.

Return The amount of profit or loss produced by an investment over a given period.

Compounding – This is the reinvestment of income to generate even more income for the future.

Inflation — a persistent increase in the average price level of goods and services, thereby reducing purchasing power.

Diversification – Investing in a variety of assets to decrease the risk factor.

Capital Formation – The process of building up the stock of capital goods such as machines, factories and infrastructure for economic development.

Retirement Corpus- A fund that takes time to be build in order to make your post-retirement life financially protected.

Passive Income– Any income you receive from an investment that doesn't require your active involvement.

Planning your finances – The organised method of handling money, including income, expenses and investments planned for future.

### 1.7 Descriptive Questions

Define savings and investments. What are the differences between them in terms of objectives and use?

Describe the purposes for saving and how it contributes to personal financial health.

Explain the 'Miracle of Compounding' in building long-term wealth with appropriate illustrations.

How does investment act as a shield against inflation?

Explain how two principles of investing - diversification and asset allocation help reduce risk in an investment.

Discuss how investments lead to the growth of capital as well as infrastructure.

Explain the relationship between investment and national economic growth.

emphasise on financial freedom through retirement corpus and passive income generation via investment.

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## Knowledge Check 1

1. b) Compounding
2. c) Higher returns
3. c) Diversification
4. b) Post-retirement security
5. b) Real estate

## 1.9 Case Study

### Case Narrative

Anita, 32M profession, earns ₹70K per month. From her income, she spends roughly ₹45,000 on living expenses and lifestyle requirements as also to support her parents. That would leave her with an excess of ₹25,000 a month. Up to this point, Anita has been putting all of the extra into a savings account that earns her nothing. She's now starting to understand the constraints of savings and advantages of investing.

[ad#Abby] Anitas has had financial planning dangled before her recently. Between workplace seminars and chats with friends, she comes to understand that savings may bring security, but they won't let her accomplish long-term goals. Plans to buy a house in next 10 years,,, Wishes to build a retirement corpus Wants enough for emergencies. And she worries that inflation will eat away at the value of her money over time.

Anita considers various options. Her parents advise her to stay put with a fixed deposits and recurring deposits, as safety is paramount to them. But her colleagues have a different opinion; they recommend equity mutual funds, stocks and SIPs. Some even suggest diversifying into real estate or bonds. Anita is thinking about managing short-term cashflow while building long-term wealth.

Anita, from a macroeconomic point of view, discusses the developments they would support. She learns that investments funnel money into productive industries, build infrastructure, create jobs and boost national savings rates. She starts to realize her personal financial decisions are connected, in some way, to the bigger economy.

### Problem Statements

How should Anita balance saving and investing for security in the short-term, with her long-term objectives?

What can diversification and asset allocation do to help reduce her risk and achieve maximum returns?

How does Anita investing rather than only saving help a country grow?

### Suggested Solutions

#### Issue 1: Balancing Saving versus Investment

Anita first needs to build up an emergency fund of at least 6–8 months worth of expenses, preferably in liquid savings avenues like the savings account or short-term term deposits. Outside of this she should be investing at least some (preferably all) of her surplus funds each month into investments that mirror my goals. For instance, SIPs into equity mutual funds will be able to fuel her long-term dreams of owning a house and retirement while some in debt instruments can take care of medium-term needs. This balance provides liquidity in case of an emergency yet not restricts her money.

#### Issue 2: Is concentration wise or dangerous?

Anita would like to spread her risk across asset classes. A possible allocation could be; 50% in equity mutual funds, 30 % in debt securities like bonds or fixed deposits and 20% in alternative investments including real estate and gold. Equity guarantees growth, debt ensures stability and alternative assets protect by hedging against volatility. As she gets older, that portfolio could slowly become more conservative. By spreading investments and maturities, exposure to market comprising the upper Rs 0.1 million of Anita's corpus are kept at bay!

#### Problem 3: The Failure to Contribute to the Economic Expansion

Anita's investments are an investment in her as well as the nation. With her investments in stocks or mutual funds, she funnels capital to companies that deploy it for growth, research and job creation. The investment in bonds or real estate promotes infrastructure development, and her involvement in the financial market helps deepen and stabilize it. So

her choice to save expands both her own economic security and the path of growth for the economy.

### Reflective Questions

Why do savings and investments belong to a financial plan?

How do savings get eroded by inflation, and how investment can play as a hedge?

How does diversification help investors in risk mitigation?

How does individual investment lead to investment and employment in the economy?

If Anita does not save for a period of 5 years, what will be the impact on the compounding and accumulation aspect of her wealth?

### Conclusion

Anita shows us why it is important not to neglect savings and investments plan as part of your financial planning. Savings offer security and instant liquidity, while investment generates long-term growth and guards from inflation, as well as giving birth to passive income streams. More broadly, investments put money into productive areas of the economy, build infrastructure, generate employment and drive economic growth. And by taking a balanced approach of emergency savings plus diversified investments, Anita also manages her personal financial future and helps the country grow.

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## Unit 2 Investment Avenues and Classification

### Learning Objectives

1. Define investment avenues and explain their role in channeling savings into productive opportunities.
2. Differentiate between traditional and modern investment avenues, highlighting their features and relevance.
3. Classify investment avenues into categories such as financial vs. physical assets, marketable vs. non-marketable securities, and ownership vs. lending instruments.
4. Explain the characteristics of equity, debt, mutual funds, real estate, and alternative investments  
in terms of risk, return, and liquidity.
5. Evaluate the advantages and limitations of different investment avenues for individual and institutional investors.
6. Understand the risk-return profiles of various asset classes and their suitability for different investor goals.
7. Apply classification frameworks to analyze the composition of an investment portfolio.
8. Relate investment avenues to personal financial planning, ensuring alignment between goals, time horizon, and risk tolerance.

### Content

- 2.1 Classification of Investment Avenues
- 2.2 Characteristics of Traditional Instruments
- 2.3 Overview of Alternative Investments
- 2.4 Introduction to Private Equity
- 2.5 Summary
- 2.6 Key Terms
- 2.7 Descriptive Questions
- 2.8 References
- 2.9 Case Study

## 2.0 Introductory Caselet

Suresh, a 40-year-old gazetted government employee, has been religiously saving money since quite some years. All his money is lying in fixed deposits and a provident fund account, which offer security but only a modest return. It's only recently that the cost of living, along with long-term requirements like funding his daughter's education and ensuring a retirement fund, are making Suresh feel that whatever he is saving so far might not be good enough to support these needs in future.

While evaluating choices, Suresh stumbles upon several investment opportunities. He hears about equities, which offer higher returns along with the risk; bonds and debentures, which offer a steady income but lower potential for growth; mutual funds, where professional management is also combined with diversification; and physical assets like gold and real estate that his family considers traditional and safe.

Bemused by the numerous options, Suresh is curious to know if these investment opportunities can be placed under a common head and objectively compared. Should he be diversified in different asset classes or should he continue investing in safe instruments as he has been doing till now? He is also wondering if he should prioritize his age, financial goals and risk tolerance more in his investment decisions.

### Critical Thinking Question

If you were to recommend to Suresh what would be your categorization of investment options available and have designed a balanced portfolio that simultaneously catered to his requirements for safety as well as providing long-term growth? What other considerations should inform your advice?

## 2.1 Classification of Investment Avenues

Investment Avenues are path through which an investor can allocate his surplus funds with a view to utilise it in income generation, capital preservation or wealth creation over times, these avenues are summarised in the figure below: 2. These avenues may be classified broadly in to real and financial assets; tangible and intangible assets; owned, risked. held, etc. It is important for investors to know the categorisation of investment opportunities, as it helps them to choose the instruments according to their purpose, time period and-risk bearing capacity.

### 2.1.1 Meaning and Types of Investment Avenues

Investment Avenues Investment avenues are the intermediate options available to an individual, a corporate or government entity to invest surplus money for possible future returns. These pathways afford an investor like you the opportunity to either protect capital, produce cash flow, or build wealth for the future. Which choice to make an avenue of investment depends on various factors like risk taking ability, time period for which one can stay invested, expected rate of return, degree of liquidity required and tax requirements.

From a general standpoint, investment channels can be classified into two dimensions. The first dimension is safety-based channels that are oriented to obtain low risk and predictable returns. For example, the government securities, fixed deposits, treasury bills and savings accounts. These instruments cater mainly to investors which have tendency for stability, preservation of capital and liquidity rather than high returns. The other vector is growth-oriented pathways that may be higher-risky, but also offer the potential for tremendous capital appreciation. This includes assets like stocks, real estate and venture capital., which are attractive to investors who can tolerate volatility in exchange for long-term wealth creation.

Broadly there are various types of investment options, as mentioned below:

## Which investment avenue should I choose?



**Fig.2.1. Investment avenues can be classified into the following broad categories**

- **Real Assets** -These are assets which have physical existence such as land, building, infrastructure, gold etc. Because real assets are of tangible value, they tend to be a good hedge against inflation. For example, real estate goes up in value and can give you rent.
- **Financial Assets:** These are shares, bonds debentures and mutual funds. Financial assets are not tangible; rather they are claims on future income or ownership. They are generally very popular for their flexibility/view to marketability and creation of income and capital appreciation both the ways.
- **Marketable Instruments:** These are instruments that can be easily traded in an organised exchange market like stock exchanges. Examples are shares, corporate and government bonds. Their liquidity and ability to be transferred, also make them desirable for those who want flexibility.
- **Illiquid Assets:** This type of investment lacks the capacity to be exchanged or sold in secondary markets. The likes of Provident Funds, insurance policies and pensions schemes are all included here. Though they are less liquid, the stability and longevity of I savings bonds offer several tax advantages.
- **Equity Investments:** These represent stakes in ownership of the asset. Examples to illustrate this are shares and real estate where the investor sees appreciation in asset value, sometimes supplemented by income generated (by way of dividend or rent) as well.

- **Lending Business:** These are investment that entail lending money to a third party with the expectation of earning interest and collection of the principal. Debentures, bonds and bank deposits come under this category which provide a fixed source of income to the holders but at a lower interest as compared to ownership investments.

Various options to invest from An investor can choose the way to park his or her money, according to individual requirements—like liquidity, capital protection, tax benefits and long-term wealth creation. While correctly classifying and identifying these avenues also leads to diversified portfolios that offer a trade-off between risk and return, there is growth while ensuring stability in finance.

### 2.1.2 Real Assets: Land, Property, Precious Metals



Tangible assets are investments in physical, concrete resources that possess intrinsic value. Real assets, which accrue value independent of contractual claims upon them (in contrast to FI assets), frequently function as a currency and inflation hedge.

#### Land and Property:

Land and real estate have long been one of the most traditional and well known types of investment. Land, like all fixed assets, is corporeal and limited in quantity; its relative scarcity ensures that it will gradually appreciate. Types of real estate investments Real estate can be divided into various types such as residential, commercial and industrial. They generate returns in two ways: rental income and capital appreciation. However, such investments have high capital upfront costs and there are also costs for maintaining them as well as a relative illiquidity versus financial assets.

## Precious Metals:

Gold, silver and platinum are traditional investment vehicles in countries with strong cultural and historical marlin to metals. Gold is a flight to safety during periods of economic tension and crisis. These metals, primarily acquire value as a hedge against inflation or deflation, are relatively liquid and serve the purpose of being a store of value. But they do not provide regular income and can be volatile in the short term, as has been particularly evident recently.

The importance of real assets is their capability to add stability and diversification in portfolios. They provide an inflation hedge, act as a wealth preserver during economic dislocations, and tend not to have high correlation with financial markets. On the flip side, downside risks (e.g. high transaction costs, regulatory complexity and illiquidity) make them less appealing to short-term traders.

### 2.1.3 Financial Assets: Debt and Equity Instruments

Financial assets entitle the holder to future income flows or claims to real property, and are sales and purchases between residents of an economy. They are instruments, whether paper-based or electronic, which have value not on the grounds of physical existence but because they are representing contractual obligations.

#### Debt Instruments:

Debt instruments include securities that are created on the basis of a loan made by an investor to a borrower (for example, a government, corporation or financial institution). This includes gilts, corporate bonds, debentures and fixed deposits. Debt instruments, because they pay a fixed interest payment and discount back to the guaranteed principal repayment at maturity, are generally less risky than equity instruments. They are a great vehicle for conservative investors who want security and consistency. But the returns are rather small — and may not keep up with inflation.

#### Equity Instruments:

Stock is a share in ownership of a company. When an investor buys shares of a firm, he becomes part owner and enjoys dividends as well capital appreciation. Equity assets are riskier than fixed-income assets

since that would hinge on the profitability and market performance of the company. But stocks present an opportunity for much greater rewards in the long term and are a great vehicle for building wealth.

Financial assets are important avenues for funds to be raised in an economy. Debt markets fund government and corporate spending, while equity markets supply businesses with funds to grow. The financial assets are extremely liquid, regulated and offered under various instruments for catering to different types of investors.

#### 2.1.4 Tangible vs Intangible Assets

Stokowski and Frankel (1998) Further opportunities for investment types is to be classified as tangible or intangible.

Tangible Assets:

Tangible asset is the physical asset which have a definable value. This could be land, buildings, gold, silver or machines and goods. You can look at these. You can feel their weight, and measure them. They can have a lot of value and can increase over the years. Material assets are especially attractive to conservative speculators who like the safety of something they can hold. However, it comes with problems including storage cost, maintenance and liquidity.

Intangible Assets:

Intangible asset Intangible assets have no physical existence but rather are the rights, claims, and intellectual property among others. In business, they may be **tangible assets such as real estate** or **intangible assets such as intellectual property** and goodwill (which include brand

equity, develop brands, patents, for example). Assets that are intangible Intangible assets matter in modern economies, where value is created through knowledge rather than physical capital and financial innovation instead of machinery.

The difference between tangible and intangible assets highlights the variety of investments. Tangible assets bring stability and cultural comfort while intangible assets often have a greater growth potential, are more scalable, and produce returns. A “good” portfolio is likely a mix of the two, to balance some stability with growth potential.

### 2.1.5 Comparison of Real and Financial Assets

Types of investments There are really two types of investments: real assets and financial assets. Both types are key to building wealth, managing risk and financial planning, albeit with some stark differences on either side.

nature, traits, and what types of returns that they provide. Learning how the different features work helps investors design portfolios that are diversified to achieve stability, liquidity, and growth.

Real Assets Real assets are physical and tangible objects such as land, buildings, infrastructure and precious metals (gold/silver). They are valuable in themselves as articles that may be put directly to use, occupation, or consumption. For instance, rental real estate both earns rental income and grows in value as time passes. More recently, gold has become a traditional store of wealth and an inflation hedge. Physical assets can be less unpredictable than other types of investments and act as a buffer in times of financial crisis. But they are typically illiquid, meaning they’re hard to sell for cash, and often require significant initial capital commitments. For example, real estate or one’s own farmland requires a lot of investment, and you can’t always sell it off just like that.

Key attributes of real assets include:

- **Tangible Value:** Their value is based on tangible, physical assets (house, land or gold).
- **Not to be Inflated Away:** Real assets generally hold their value or appreciate with inflation, protecting purchasing power.

- **Income Potential:** Returns could be in the form of rent (as land), farm production (as a farmland investment) or usages rights (like toll roads or infrastructure developments).
- **Lack of Liquidity and High Entry Barriers:** Property or precious metals usually take time to sell and require substantial capital at the onset.

Financial Assets, in contrast, are instruments that are not physical in nature and denote a contractual arrangement to receive cash or equity from another entity. Equity shares, bonds mutual funds, fixed deposits are the examples of the same. They are easily tradeable, sellable and no one will break your balls if you want to convert them into smaller pieces; they're liquid as opposed to real assets. For example, an investor can buy shares worth just a few thousand rupees on a stock exchange, while real estate may need lakhs or crores. Assets can provide an income on a regular basis such as interest, dividends, or rent: these can be cash flows (received) from securities such as shares or deposits (at a bank), or purchase price. Their returns are highly correlated to market performance, interest rate changes and broader economic cycles.

Some Characteristics of Financial Assets:

- **Liquidity:** Easier to trade on markets, convert into cash.
- **Divisibility:** Shares or bonds can be purchased in relatively small units (one each), making them affordable for a wide range of investors.
- **Return variation:** Debt securities (such as bonds) offer a fixed rate of return in the form of interest, and preferred stock provides a fixed dividend payment.
- **Sensitive to Market:** They are dependent on company performance, economic growth, also influenced by monetary policy and market overseas.

Comparison and Interplay:

Real assets are primarily used to store wealth and hedge against inflation, whereas financial assets are more efficient in mobilizing capital and offering liquidity. For instance, a person may accumulate real estate as an inflation hedge and store of value, but invest his or her financial capital in the stock market for growth. In economies where cultural bias is more for tangible forms of wealth like land in India or Gold, real assets rule the roost whereas financial assets provide a backbone to contemporary financial systems by redirecting savings into profitable investments.

The best portfolio is generally a mixture of the two categories, to achieve a combination of safety, income, liquidity and potential growth. For example a person may chose to invest some of their funds in commercial property because it tends to be stable as well as acting as an inflation hedge, and into shares and bonds for more consistent returns.

Examples:

- Real Assets: Homes, farm property, commercial buildings, gold and silver.
- Financial Assets: Ownership of shares of companies (like Infosys, Reliance), government bonds, corporate debentures, fixed deposits in banks and MUTUAL FUND SCHEMES.

So long as financial assets prevail in terms of accessibility and wealth generation, real assets are necessary to secure the longer-term potential for security, avoidance over time of cash shrinkage (due to inflation), and cultural value. A mix of the two provides a balance resistant to the vagaries of economic conditions.

## 2.2 Characteristics of Traditional Instruments

Traditional financial instruments include investment alternatives that have been around for decades, and are still popular because they are considered less rick (compared with alternative investment such as the stock market); predictable, having a high degree of transparency; understandable and easy to use. These vehicles are structured to protect the capital investment and provide consistent, yet low yields. They work well for those who have conservative financial objectives, and prefer safety over aggressive wealth building. Such

11 instruments could be fixed deposits, bonds, shares, the Public Provident Fund (PPF) and National Savings

Certificates (NSC). The risk-reward profile for such investments typically skews toward safety, however return may not always keep up with inflation.

### 2.2.1 Fixed Deposits: Features, Returns, Safety

Fixed deposits (FDs) are the oldest and most common savings investment product in financial sector. Available with both banks and non-banks (NBFCs), you may deposit a lump sum for a fixed tenure, where interest is to be calculated at the rate decided in advance. The main attraction of FDs is that they are predictable, stable, and offer capital protection.

An FD works on this principle: the amount invested in a fixed deposit is locked for a tenure as short as few days or as long as several years, and interest is paid to the depositor at the rate that was decided while closure. The interest rate on the FD is locked in for the period invested, so they are a good option for investors who do not like to take too much risk.

#### Features of Fixed Deposits

- **Tenure Flexibility:** You can deposit the money for anything between 7 days to a maximum of 10 years.
- **Fixed interest and guaranteed:** The rate is fixed throughout the term, providing certainty about returns.
- **Flexible payout option:** Investors can opt for cumulative FDs, where interest is reinvested and repaid at maturity or non-cumulative FDs, where interest payments are made periodically.
- **Liquidity through loans:** Many banks provide loans or overdraft facilities against the FD amount in order to ensure that investors have access to funds when required.

FDs The returns of FD depends on tenure and the institution. Banks tend to offer interest between 3% and 7% a year, while private NBFCs may give slightly higher. Elderly persons typically get an extra interest-rate benefit. But, income tax on FD interest brings down the yield as the interest is added to an individual's taxable income. In addition, inflation on interests' earnings' yield, also lowering the real rate of return compared with investment that is locked for a long term.

FDs are no exception as for as the security is concerned. They're supported by well-known banks and regulated entities. In India, each depositor is insured for basic bank deposits of up to ₹5 lakh with the Deposit Insurance and Credit Guarantee Corporation (DICGC) in order to ensure that at least a certain part of the savings is safe under all circumstances. So, FDs are particularly attractive to the conservative investors, retirees and those saving for short- terms goals where safety is more important than higher growth.

Nonetheless, FDs also have limitations. Early withdrawals are charged a penalty, diminishing the overall return. The interest is also not inflation-adjusted so the purchasing power of the returns could diminish over time. In spite of these limitations, fixed deposits still remain quite important because they are relatively safe and easy to operate.

### 2.2.2 Bonds: Different kinds, Risk/Return/Rating

Bonds are also another pillar of traditional financial products; this is a more formal contract in which the investor has given some money to an issuer (company or government) by means of a loan. When someone buys a bond, he is lending money to the issuer (like a government, municipality or corporation) in exchange for regular interest payments and the return of principal upon maturity. Bonds are in the middle of the risk scale from bank deposits to high-risk shares for investors who seek safety but wish to earn a return.

There are a few types of bonds available based on the issuer and structure. Government bonds, also known as gilts or sovereign bonds, are essentially risk free as they are backed by the government. Corporate bonds, by contrast, are issued by private companies and come with more risk — but also higher returns. Municipal bonds are instruments intended to fund urban projects and they have increasingly been accepted in the urban financing scene.

Other types of bonds are convertible, meaning they can be converted into shares after a predetermined date, and zero-coupon bonds, which pay no regular interest but are instead issued at a discount to their redemption value. Inflation-linked bonds are intended to shelter against rising inflation by keeping returns in line with spikes in the cost of living.

## Risks Associated with Bonds

### Navigating Bond Investment Risks



• Credit Risk: The risk that the issuer will not be able to pay interest or repay principal.

• Interest Rate Risk: Rising rates reduce the market value of existing bonds because their prices move inversely to interest rates.

• Liquidity Risk: Certain bonds may have a less active secondary market and can be difficult to sell prior to maturity.

• Reinvestment Risk: The risk that coupon receipt from a bond with fixed coupons may have to be reinvested at lower yields.

To mitigate that risk, bonds are rated by credit rating agencies like CRISIL, ICRA or Moody's. High-rated (AAA or AA) specify above average repayment ability and below average for low-rated ones, implying speculative risk. So ratings help investors understand how safe their investments are.

Bond returns are based on the coupon rate, tenure and issuer creditworthiness. The bet on government bonds is single-digit yield, but secure, whereas the autocall on corporates will give you a higher pay day - with added risk. Bonds are especially important for institutional investors such as pension funds, because they offer predictable sources of cash.

It's because of that trade-off between security and return that bonds are a part of many investment portfolios: status quo for those investors who want manageable risk with predictable income.

### 2.2.3 Equities: Ownership, Volatility, and Growth Potential

Shares One of the most active and well-known investment instruments is a stock or share. They are ownership stakes in a company, so when an investor buys shares of stock, they effectively become shareholders -- and co-owners -- of the business. Investors own a piece of the company and, therefore, an investment in a public company has the opportunity to profit from earnings and share price growth. Equities provide an entirely different kind of saving vehicle from conventional savings tools like FDs or Bonds, with equity investments allowing investors to share in the fortunes of a business -- thereby getting wealth linked to growth and innovation.

Equities are characterized by being part owners of a company. Bonds are often described as a loan contract in which the investor is the creditor with an asset that yields fixed interest. Shares of stock, on the other hand, represent an ownership interest in the company. Investors not only have entitlement to residual profits after all of the Company's liabilities are paid, but also the power to vote is transferred upon them where they can influence substantial decisions in one-to-one meetings. Herein lies the unique nature of the equities (shares) that link investors with businesses, in both financial and participatory terms.

Stocks are actively traded on stock exchanges like **BSE (Bombay Stock Exchange) and NYSE (New York Stock Exchange)**. This trading is very liquid, giving investors no problems buying or selling shares. They cater to both short-term traders who try to take advantage of daily price swings and long-term investors aiming to amass wealth over decades. But stock prices are by

nature volatile and affected by many factors including company results, sector outlook, macroeconomic policies or events happening across the world as well as swings in investor sentiment.

Key Characteristics of Equities include:

- **Ownership Interests:** Shares in companies differentiate themselves by an ownership stake, rather than a fixed payment commitment like bonds do.
- **Dividends:** Companies can pay out a portion of their earnings to shareholders in the form of dividends which provide periodic income as well as upside potential if prices increase.
- **Capital Appreciation:** As companies innovate and grow their business, and ultimately earn higher profits than before, share prices can soar, making stocks an incredible wealth-building tool.
- **Liquidity:** Shares can be traded easily and swiftly in secondary markets, providing investors with flexibility.
- **Voting Rights:** Equity holders are often able to vote and thus contribute to company decision-making.

Despite all these qualities that make equities appealing, they are also volatile. Equities may soar when economies flourish, but will just fall as hard or worse during slumps or crises. Equity markets tend to see large falls during periods of global recession, while company-specific scandals in the form of accounting frauds or mismanagement can quickly erode investor wealth. Interest rate increases, inflationary pressures and geopolitical tensions are other factors fuelling regular volatility in stock prices.

Risks of Equities include:

- **Market Risk:** Stock prices are affected by general economic and political conditions.

- **Business Risk:** Poor management, lack of capital, loss of competitive position, or operating problems could result in a decline in profitability.
- **Economic Risks :** Recessions, inflation or government regulations could adversely impact the returns from equities.
- **Psychological Risk:** The prices get pulled by investor sentiment and herding such that they temporarily move far away from the fundamental value, or even reverse direction leading to either a bubble or an abrupt correction.

In spite of those risks, no other asset will offer returns that come close to equities. Experiences from the past reveal that equity markets have outstripped most asset classes when taken over a sufficiently long time, providing real returns that protect and enhance investor wealth. For instance, equities with a good exposure and index funds have delivered 10-12% whenever these are invested for multiple decades which is way beyond what can be expected from fixed deposits or popular bond instruments.

Thus, equity is crucial for long-term objectives such as retirement planning, creating wealth and achieving financial freedom. They work best for those with an appetite for short term fluctuations and are somewhat long-term oriented 'coz being patient is key to riding out market cycles and enjoying the rewards of a compounding engine. As part of a well-diversified portfolio, stocks play off the stability of safer securities to provide the torque for long-term prosperity.

#### 2.2.4 Public Provident Fund (PPF) and National Savings Certificate (NSC)

Public Provident Fund (PPF) and National Savings Certificate (NSC) are two very popular government-backed schemes in India. Both are meant to inculcate small savings and provide a secure investment option, most importantly for those who despise volatile market-linked products like equity or mutual funds because these are the simplest of saving investments. The primary selling point has always been the sovereign guarantee, tax benefits and assured returns -- with the miracles of compounding all one needs for a happy retirement or child's education. While the structure and features may differ, each partners with the other to help you build a solid savings plan.

Public Provident Fund (PPF) is one of the most popular savings schemes in India which was launched by the Government of India aiming to construct a tax saving investment plan for long-term retirement planning. With a maturity period of 15 years, which can be further continue in blocks of 5 year each, the PPF encourages discipline savings among savers while giving them an opportunity to build up a decent corpus over time. The minimum annual payment is ₹500 and the maximum investment allowed in case of all eligible officers/members is 1.5 lakhs u/s 80C for tax Rebate/Relief.

₹1.5 lakh per year. Its quarterly coupon interest rate set by the government is not high, but it is certain and its annual compounding protects the growth in investment. The fact that the PPF enjoys tax benefits under EEE regime (contribution made is eligible for deduction as per Section 80C of the Income Tax Act, and interest earned in your account as well as proceeds on maturity are completely tax-free) makes it very attractive. You are not likely to find this level of tax efficiency anywhere else. From the point of view of liquidity, while the lock-in is fairly long, partial withdrawals (something which happens in most tax-saving investments) are allowed after 7 lakhs and loans can be taken against the balance from within 3 lakhs. So, a salaried person contributing ₹1.5 lakh in PPF every year for 15 years can build up a retirement corpus of over ₹40 lakh (assuming present interest rates) absolutely free of tax and be a very effective wealth builder in the long run.

In contrast, the National Savings Certificate (NSC) is a medium term fixed income investment available for 5 years. It is designed to promote saving amongst individuals by providing fixed assured returns with capital protection. The rate is announced by the government and remains constant for the entire duration. Although the interest is accrued annually, it is received by the lender only at maturity: hence a lump-sum flow to investors. NSC investments are eligible for deductions under Section 80C upto ₹1.5 lakh a year, but the interest generated is payable. One important aspect is that the interest earned every year will be treated as re-invested and will qualify for deduction under section 80C, except in the last year. Investment in NSC is easy; it can be bought through the post office. It's a boon for rural and semi urban people who don't have access to complicated financial instruments. For instance, a person can invest ₹50,000 (in NSC) at a fixed 7% rate and receive an amount of approximately ₹71,000 after 5 years with assured growth and tax savings during the investment tenure.

In short the features are:

- PPF

- o Tenure: 15 years (renewable in blocks of 5 years).
  
- o Investment Limits: ₹500–₹1.5 lakh annually.
  
- o Tax Benefits : EEE regime; No tax in respect of entire withdrawal.
  
- o Liquidity: 7th year eligibility for partial withdrawals; loans after 3rd year are available.
  
- o Best For: Retirement and savings for long-term wealth development.
  
- NSC
  
- o Tenure: 5 years.
  
- o Payments: Fixed rate compounded on an annual basis and paid at maturity.
  
- o Tax Benefits: You can claim tax benefits under section 80C and the interest is taxable.
  
- o Availability: Widely available at post offices throughout India.
  
- o Best For: Medium Term Savings and Safe Returns with Tax Benefits.

To sum it up, PPF works well as a long term wealth building tool for retirement corpus creation while NSC is perfect to meet medium-term saving needs that also offer assured returns. Both products, even if they offer lower returns compared to equity-based instruments, are indispensable for the conservative investor who would prefer capital protection, tax benefits and assured returns. A well-balanced portfolio would have both, where PPF acts as the base for retirement planning and NSC provides higher degree of flexibility to match contracts with money needs (shorter financial goals such as children's education etc or meeting pending expenses at some future date).

### 2.2.5 Risk-Return Trade-off in Traditional Instruments

The risk-return trade-off One of the basic principles of finance is the notion that the level of risk you are willing to take on determines your potential return. The more return you're going to get, generally the more risk you have to take; and if your investments stay safe, they'll yield a small but steady return. Conventional financial instruments demonstrate this trade-off clearly, since they are usually designed to reduce risk even if that reduces return. The instruments are the base of a common investor for their financial planning as they offer safety and predictability of return. But, their drawbacks are very apparent when compared to inflation and the opportunity cost of more aggressive investment alternatives.

Fixed Deposits (FDs) is an excellent example of a safety-first instrument. Banks and financial institutions provide FDs, which ensure repayment of the principal amount along with interest at a fixed rate. They are almost risk-free because they tend to be insured, up to a certain point. However, the interest rates for FDs are low, generally between 5% and 7% per year and so might not be able to beat inflation. For example, if inflation is 6% per year, and the FD offers returns at 6.5%, the real return is minuscule. This underscores the classic trade-off between risk and return — you're getting safety, but at the lifelong loss of wealth.

Bonds complicate the picture just a bit. Government bonds are considered very safe as they come with sovereign backing, however their yields may be low at times, even falling below FD rates. In comparison, corporate bonds pay relatively more to make up for the extra risks averse investors are taking, that of default or increasing interest rates. For instance, a AAA-rated corporate bond may offer an 8% yield, but it's not completely risk-free —since repayment hinges on the financial health of the company. In contrast, government securities (say Treasury Bills or G-Secs) could be around 6–7% with almost no default risk. This places bonds in the middle of the risk/return spectrum, as you're going to get moderate risk with moderate return.

On equity side, risk-return dynamics are completely transformed. While equities are also considered part of traditional baskets in general terminology, they are structurally distinct (as due to their ownership quality versus the fixed-income nature) and consequently should not be approached as such. Stocks are extremely volatile in the short term, but offer substantial potential for wealth generation if held over extensive periods of time. Historical trends in the Indian stock market reveal that equities have provided an average long-term return of 10-12%, much higher than what can be expected from FDs or bonds. But there are substantial

associated risks as well, including the potential for market collapses that can result in temporary capital losses. For example, during the 2008 financial crisis, stock markets dropped by more than 50%, causing big losses to investors who stayed in the market, but those who remained invested long term often recovered and reaped rewards.

On the other hand, PPF and NSC focus on maximising safety. Both are government supported programs, so the ability for a borrower to default is almost null. But their non-fluctuating aspects also limit the potential upside. There is the 15-year PPF which provides tax-free compounded returns anywhere between 7%-8%. So does NSC, a long-term saving instrument that gives guaranteed returns to investors and offers tax breaks under Section 80C of the Income-tax Act. The interest from NSC is however taxable. They're great accounts for people who want to develop savings discipline and establish their long-term financial security rather than for those pursuing aggressive capital growth. For example, someone investing ₹1 lakh a year in PPF for 15 years can save about ₹30-35 lakh at the current rates – safe as well as predictable but not in league with rapid wealth expansion.

Learning from this example, the risk-return trade-off in conventional instruments can be described as follows:

- Low Risk = Low Return
  - o Examples: Fixed Deposits, PPF, NSC.
  - o Safety of the capital is given a high priority; hence, may be suitable for risk-averse investors.
  - o Returns often do not even keep pace with inflation in the long run.
- Moderate Risk = Moderate Return
  - o Examples: Bonds (especially corporate bonds).
  - o Slight superior returns to FDs; risk proportioned to credit worthiness of issuer.

- o Decent for a balanced portfolio with some risk tolerance.

And High Risk =Possibly High Return

- o Examples: Equities.

- o High volatility in the near term but good long-term wealth creation potential.

- o Needs patience, discipline and a higher risk tolerance.

As such, traditional instruments offer a variety of options that are designed to accommodate investors with very different investment objectives or risk appetites and time horizons. Okay they may not be building you a fortune, but they are helping to insure one. A common practice is to go in for a layered approach- some portion (say 30 or 40% of your money) goes into the safe zones – Fds, PPF, NSC and the like for providing safety while the rest could be parked in bonds and stocks for earning higher returns. Thus, the risk-return trade-off becomes a mandated policy that seeks to protect capital while also providing long-term growth.

### **“Activity 1 : Comparing Traditional Investment Choices”**

Imagine you are advising a first-time investor who has ₹10 lakh to allocate across different traditional instruments such as fixed deposits, bonds, equities, PPF, and NSC. Prepare a brief investment plan explaining how much you would allocate to each instrument, the rationale behind your choices, and the balance of risk and return in your strategy. Discuss how your plan changes if the investor’s goal is short-term safety versus long-term wealth creation. This activity helps you critically analyze risk-return dynamics in traditional instruments.

## 2.3 Overview of Alternative Investments

Alternative investment is a term to describe the broadest asset classes, as opposed to traditional bank deposits and fixed income instruments such as National Savings certificates (NSCs) or provident funds. Such investments are intended to be spread for diversification, better returns and an exposure in different asset class than the mainstream market. It's not like the customary instruments, most alternative assets typically have more risk, complexity and levels of liquidity yet they can bring great diversification to portfolio in challenging times as well as enhance your own wealth!

Typical examples of alternative investments include mutual funds, ETFs (exchange traded funds), REITs (real estate investment trusts), metals commodities such as gold and silver, futures or other derivative contracts. All have their own characteristics, pluses and minuses, and in combination I think they offer a real set of choices for investors who are ready to look beyond 'the usual' places.

### 2.3.1 Mutual Funds: Types, Structure, and Benefits

Mutual funds are pooled investment vehicles that either invest in stocks, bonds and the like or in money market instruments. They are overseen by financial regulators and run by professional fund managers who build portfolios to fulfill certain goals. Mutual funds are especially great, essentially because they empower little investors with professionally managed and diversified portfolios that would be nearly impossible to create on your own.

The design of a fund typically includes these three central roles:

- **Fund Sponsor:** The sponsor creates the fund, contributing initial capital which is a foundation from economic trust and obligations. Sponsors are typically well-known financial institutions so the investors have confidence in the product.
- **Asset Management Company (AMC):** The AMC invests the pooled funds in the portfolio of securities according to the stated investment objectives. It hires analysts and fund managers to pore over markets, pick securities and maximize performance in your portfolio.

- Trustees: Trustees are responsible for safeguarding the best interests of investors and ensuring the fund's adherence to laws and ethical practices. They provide an important layer of protection for investors.

## Types of Mutual Funds

- Equity Funds

Equity Funds: Invest in stocks, The shares of companies are what the mutual fund category most suitable for growth investors is. Their main objective is growing capital because the stock market goes up "on average" over time — reflecting company growth and economic expansion. Differing in risk and return are categories of equity funds such as large-cap funds, mid-cap funds and small-cap funds. Large-cap funds invest in larger, time-tested companies that typically are less volatile, while small-cap funds aim for smaller companies that may provide more growth - but also hang a greater potential of risk. Such funds are more appropriate for investors who can withstand short-market fluctuations and want to create wealth over longer period like retirement, kids education fund etc. But the fickleness of stock markets dictates that investors need to be ready for temporary falls when doom prevails.

- Debt Funds

Debt funds invest in fixed-income instruments such as government securities (G-Secs), corporate bonds, treasury bills, debentures etc. They're meant to generate a reliable income and protect the principal, which means they are less risky than stock funds. Depending on the maturity of the securities it has in its portfolio, a debt fund can be an overnight fund for one day instead of longer durations or liquid funds; gilt funds for government securities like bonds and notes; income funds with longer maturities. Because they offer assured interest payments, conservative investors, retirees and those looking for predictable cash flow with minimal risk appetite prefer these securities. But like any other investment there is risk — bond prices can be influenced by changing interest rates, potentially causing the value of a fund to fluctuate. Yet their less volatility relative to equities means that they form the bedrock of balanced portfolios.

- Hybrid Funds

Hybrid or balanced funds are those that invest across equities and debt in various proportions. Their goal is to provide a combination of growth and stability, appealing to medium-high-risk investors. For instance, within hybrid funds, a hybrid aggressive fund could invest up to 70% of the portfolio in equities and 30% in debt - growth with moderate risk -- while a conservative hybrid fund will hold 70 per cent or more of its total assets in debt instruments (including 30% allocation to equity) – stability with limited exposure to the volatility from equities. Hybrid funds offer flexibility as they can tailor risk-return profiles based on investors' requirements, providing diversification within one scheme. They are ideal for new investors who prefer to have interest in equity markets but do not want to take a great deal of volatility. Still, the performance of hybrid funds is linked to equity and debt markets in proportion with their holdings so they also carry risks for both the asset classes.

### 3 • Index Funds

Index funds are mutual funds that track the performance of particular stock market benchmark index such as Nifty 50, Sensex in India or S&P 500 globally and are managed passively. Rather than selecting stocks, index funds reflect the composition of an index, a feature that renders them cost-effective by virtue of lower fund fees. The strength of index funds is their simplicity, transparency and their ability to mirror the broad market returns. As indices are often the who's who of companies in a country or sector, index funds are also safer compared with thematic funds but not completely free from market risk. These funds are ideal for long-term investors who seek steady market-linked growth without relying too heavily on fund managers' stock-picking skills. The trade-off is that there's no chance an index fund will outperform the market, but it can reliably return what the market does.

### • Sectoral/Thematic Funds

Sectoral or thematic funds – These focus specifically on a particular sector (technology, healthcare, banking, infrastructure etc) or broader themes like ESG (Environmental, Social and Governance), renewable energy etc. Such funds offer the concentrated exposure to sectors believed to be promising in future. For instance, in a period of technology boom, IT sector funds can give very high returns. But that narrow focus makes them riskier than diversified equity funds because poor performance in that sector will be felt directly. Working for: Investors who know an industry well and are comfortable taking more risk, as well as those who want to capture trends in a sector. They are able to provide enormous returns during a booming sector, but carry enormous risks on the downside when it isn't.

## Benefits of Mutual Funds

- **Diversification:** With a small amount of money at risk, investors gain exposure to a number of securities, limiting the damage from any single asset's poor performance.
- **Professional Management** - The investments are managed by professionals who have the tools and knowledge to make investment decisions, which help investors avoid the difficulties of day-to-day market analysis.
- **Liquidity:** Redemption at Net Asset Value (NAV) is offered on business days by most MFs, providing flexibility to investors.
- **Access:** Thanks to SIPs, Investors can start the process out by investing small amounts, so that it becomes more accessible for any new investor.
- **Tax Benefits:** Some funds like **Equity Linked Saving Schemes (ELSS)** offer tax benefits under Section **80C**, thus making them more attractive for the investors.

However, mutual funds do not come without risk. Their returns are tied to performance of the underlying assets, and management fees can erode gains somewhat. Three plus one alternatives to equities But their combination of potential growth, pocket-friendly pricing and diversification has made them one of the most favoured alternative investment alternatives.

### 2.3.2 Exchange Traded Funds (ETFs): Liquidity and Cost-efficiency

Exchange Traded Funds (ETFs) are a novel type of investment that combine the best aspects of mutual funds and individual stocks. An ETF consists of assets such as equities, bonds and commodities or a market index and trades on stock exchanges in units similar to shares. This arrangement offers a straightforward, low-cost means of diversifying an investment portfolio.

Unlike mutual funds that are priced once per day at the NAV, ETFs are continuously "priced" throughout market hours. This enables investors to purchase or redeem units in real time, offering greater control and flexibility.

### Advantages of ETFs

- **Liquidity:** Since ETFs trade on stock exchanges, investors may purchase or sell them during market hours. This makes ETFs very appealing to long term investors as well as short-term traders.
- **Low Expense Ratios:** Like mutual funds, ETFs closely track and index over time, so they don't need major active management. This provides a cost advantage which is reflected in expense ratios much lower than for actively managed mutual funds.
- **Transparency:** ETF portfolios are generally disclosed daily. Investors also "know what the funds hold" with this fund; there is never any doubt which securities are held within a Portfolio, ensuring transparency and informed decision making.
- **Diversification:** One ETF can cover an entire index or sector. You could, for example, buy a single Nifty ETF and have access to the shares of the 50 largest companies in India, spreading risk across a number of companies.
- **Trading flexibility:** ETFs can be utilized for complex trading strategies such as hedging and arbitrage, thus appealing to institutional market participants too.

### Types of ETFs

#### • Equity ETFs

Equity ETFs invest in a basket of stocks that replicate the performance of a stock market index, such as Nifty 50 or Sensex in India or S&P 500 on a global scale. Investors can access a diversified portfolio of shares across sectors and companies by purchasing one unit of an ETF.

This mitigates the risk versus purchasing individual stocks, but still follows the general trend of the equity space. Are also generally passively managed meaning they don't trade in and out of the index very often with associated reduced costs. They can be ideal for long-term investors looking to build wealth through exposure to stocks, but they do still come with the risk of choppiness if stock markets dip.

- Bond ETFs

Bond ETFs concentrate on bonds or multiple types of fixed-income securities—government, corporate, or municipal. They offer investors the ease of entry into bond markets with stock-like trading and predictable income via periodic coupon payments. For example, a government bond ETF grants access to sovereign debt and a corporate bond ETF offers higher yields in exchange for more credit risk. As a result, bond ETFs typically are favored by conservative investors looking to round out equity-heavy portfolios and add some stability — while also lowering overall volatility levels. But they are not entirely immune to interest rate risk, because bond prices can fall when rates rise.

- Commodity ETFs

Commodity ETFs give investors exposure to a physical commodity, such as gold, silver, oil or agricultural goods -images\without having to own and store the assets.\pard \ulnone Like all ETFs. An example of this would be a gold ETF, where the fund holds physical gold and investors can profit from price changes in gold without any storage needs. And oil ETFs follow the price of crude, allowing one to get in on energy sector action. It is a useful inflation hedge. Commodity ETFs can be particularly useful as an inflation hedge, because when there's high inflation, commodity prices also tend to rise. But they can be unstable — commodities prices are affected by global demand, geopolitical considerations and supply chain interruptions.

- International ETFs

International ETFs provide investors exposure to other markets, like the U.S., Europe or emerging economies, without the need of specifically investing in foreign stocks or having accounts abroad. With international ETFs, investors can diversify beyond their own domestic economy and reduce the risks that come from being more concentrated in a single market. Such as an ETF that tracks the S&P 500 can be availed by Indian investors to derive.

U.S. market performance. For those causal about it, these ETFs are particularly appealing for access to global diversification and also a hedge against local recessions. Unfortunately, it also comes with exposure to foreign exchange risk, which is the unpredictable rate movements and how those rates can have an impact on returns in the investor's home country.

ETFs are effective, but can have the liquidity of the assets they hold. Please note also that investors must have brokerage and demat accounts to purchase ETFs, not everybody will qualify. However, ETFs remain a good tool for investment since they are cost-effective, transparent and can be bought and sold easily.

### 2.3.3 Real Estate Investment Trusts (REITs): Structure and Access

**Real Estate Investment Trusts (REITs)** is a fabulous inventions whereby people's money can be pooled together to invest in cash flow properties. Investors are able to buy and sell units in REITs through stock exchanges, rather than having to invest in entire properties that require large amounts of capital. What makes the structure interesting is that it democratizes real estate investing, by allowing people to gain access to large-scale commercial assets like office buildings, shopping malls and industrial warehouses.

The structure of REITs includes:

- **Sponsor:** The party responsible for establishing the trust, generally by contributing the underlying real estate. Typically, sponsors are large developers or financial entities.
- **Trustee:** An entity that keeps the assets for investors, promoting transparency and accountability.
- **Manager:** A professional team who oversees the trust, manages assets and ensures rental income is collected and distributed in an efficient manner.

There are rules and regulations to which REITs must comply, requiring them to distribute a substantial chunk of their income, typically in the vicinity of 90%, back into the pockets of

investors in the form of dividends. This has made them attractive to income-hungry investors who seek stable, recurring payouts.

### Advantages of REITs

- **Ease of access:** Investors can gain exposure to real estate with much smaller investment amounts versus direct property ownership, which usually requires a large overall outlay.
- **Diversification:** REITs own multiple properties in various regions and sectors, reducing risks that come with owning a single property.
- **Liquidity:** Investors can sell their units fairly easily on the exchanges, as opposed to trying to sell real estate.
- **Expert Management:** REITs are managed by professionals and therefore will benefit from better utilization of properties, rent collections, and maintenance.
- **Appreciation Potential:** In addition to dividends, REITs may provide returns as the value of the properties they're invested in increases.

However, REITs also carry risks. They are impacted by such factors as demand for real estate, interest rate shifts and general economic conditions. Complications in rental markets could lead to fluctuations in dividend income, and increasing interest rates can reduce the demand from investors for REITs.

#### Did You Know?

"REITs were first introduced in the United States in 1960 to give small investors access to large-scale real estate projects. In India, the first REIT debuted in 2019, enabling individuals to participate in commercial property markets with relatively small investments."

### 2.3.4 Commodities: Gold, Oil, Agricultural Assets

What are Commodities? What exactly is a commodity? They're what are known as alternative investments but have one important difference for investors: Unlike company earnings and fixed coupon payments, they derive their value directly from supply and demand dynamics rather than any cash flow. Commodities are things like precious metals as gold, energy resources as oil or agricultural goods such as wheat or coffee.

#### Gold:

Historically, gold has been regarded as a "safe haven" asset. It serves as a client's protection during inflation, devaluation or geopolitical condition. Options to invest in gold include physical bars and coins, gold Exchange Traded Funds (ETFs) or sovereign gold bond. It is an essential component of many portfolios, as a hedge against economic uncertainty.

#### Oil and Energy Products:

Crude oil and natural gas are key strategic products that fuel industries across the globe. The commodities deliberately play contain supply restrictions, geopolitical conflict and global demand. Oil investments are typically through futures contracts or E.T.F.s. Yet oil markets are easily roiled, and the smallest disruption in supply can send prices sharply higher.

#### Agricultural Commodities:

Agricultural products, such as wheat, soybeans and coffee, are staples of global demand. Seasonal cycles, weather patterns, trade policies and global demand can quickly feed into rising prices. They offer diversification, but also risks like crop failure or weather-related disruptions.

## Benefits of Commodity Investing

- **Inflation Hedge:** Commodities frequently gain value when inflation grows, helping to protect investors' purchasing power.
- **Diversification:** Commodity prices frequently move in the opposite direction of those for stocks and bonds, mitigating total portfolio risk.
- **Global Demand:** Demand for commodities is global meaning they are always relevant in investment portfolios.

Yet commodities are also risky. Their markets are highly speculative, and the prices may fluctuate widely in response to (news of) political instability, a change in government or an economic downturn. Commodity investors need to be able to accept volatility and have a strategy.

### 2.3.5 Hedge Funds and structured products (simple Intro)

In the evolving landscape of financial markets, investors now have more exotic instruments to choose from as opposed to the traditional fixed deposits, bonds or equities. Product development also means new, advanced products such as hedge funds and structured products which have been developed to provide a higher performance potential and better portfolio diversification. But these instruments are much more complicated, riskier and usually intended for high-net-worth or institutional investors who have the wealth and financial sophistication to navigate their intricacies. They expand the investment possibilities considerably, but they require careful assessment of risks, costs and suitability.

#### Hedge Funds

A hedge fund is really just a way to pool investment capital from wealthy people — and increasingly comes from pension funds, insurance companies and other institutions. Unlike mutual funds which are highly regulated and have to

keep to investment rules, hedge funds have the freedom to do what they want as they are loosely regulated. Hedge funds' main goal is to produce absolute returns, meaning positive returns as the market goes up or down.

They are able to do this by using a variety of sophisticated strategies:

- Using other people's money to increase the size of investment positions and potential gains.
- Short Sale – a transaction that makes money when the price of assets decreases -the sale of borrowed securities with the intention to repurchase them at a lower price.
- Options, futures or swaps trading – for hedging risk and/or speculation on the market.
- Arbitrage – taking advantage of price differences between two or more markets or products to make risk-free money.

In a market downturn, for example, a hedge-fund manager could short-sell overvalued stocks or buy derivatives that appreciate in value when markets decline. Likewise, global macro hedge funds examine broader economic trends — from shifts in interest rates and currencies to geopolitical events — that allow them to place bets anywhere in the world.

Hedge funds are attractive to investors because of their ability, particularly since the 1990s, to generate very high returns as many were able to outperform traditional markets in that decade. But this comes with risks of equal magnitude. The collapse in 1998 of Long-Term Capital Management (LTCM) is a celebrated example — led by a couple of Nobel laureates and a bunch of top traders, traded not just about everything under the sun with excessive leverage, and had seriously bad bet in terms of bond spreads that nearly brought down the entire global financial system. This is how hedge funds can be both powerful wealth creators and systemic risk sources.

Structured Products

Structured products are made-to-order investment vehicles which collate standard securities such as bonds and equities, buccaneer them together with derivatives and create bespoke payoffs. They are created to satisfy an investor need, including:

- Asset Protection – protection of the principal by offering an exposure on returns linked to market.
- Geared Exposure – magnifying returns associated with a specific index, commodity or currency.
- Contingent Returns – providing payments related to certain events, such as the performance of an equity or level of interest rate.

Common examples include:

- Equity-Linked Notes (ELNs): products that offer returns based on the performance of a stock or index, frequently with downside protection.
- Capital Guaranteed Bonds: securities that protect the principal but link interest rates to market indices, if only for investors to recoup their capital.
- Reverse Convertibles: high coupon paying instruments which convert into shares if stock prices fall below a predetermined level.

For example, as an investor you may buy a structured product that ensures 100% of the principal after 5 years while providing a return equals to 70% of gains made in NIFTY50 index. These products seem to entice investors who seek equity-linked upside but are not willing to gamble their principal. But the embedded derivatives make these products complicated for the average investor to comprehend and risks involved may not be completely clear.

Comparative Role and Accessibility

Hedge funds as well as structured products are also not easily available to retail clients because of their high minimum investment requirement. “Minimum investment is usually in several crores for hedge funds, while you can access structured products mainly through private banking channels. That same complexity also means that they demand thorough financial advice and due diligence.

- Hedge Funds: Ideal for high risk tolerant investors looking for diversification and who can handle a good amount of volatility.
- Structured Products are deemed more suitable for those direct investments who require the access to markets with bespoke risk-return characteristics and features.

## 2.4 Introduction to Private Equity

Private equity (PE) is a significant segment in contemporary finance which deals with direct investments into companies that are not listed on the public stock exchanges. Unlike public equity, which is traded freely in shares, private equity transactions are negotiated with risky long-term bets. The focus is normally on supporting business growth, turnaround or innovation with a view to exiting profitably. Although private equity is often associated with high returns, it also entails illiquidity, higher risks and specialized knowledge. Over time, private equity has emerged as a critical source of capital for companies of all shapes and sizes in the OpenFileDialog.SelectedItems.

sectors and life stages, whether they are early stage start-ups all the way to established business that require buyout or restructuring.

### 2.4.1 What is Private Equity?

Introduction (PE): These types of funds invest directly in private companies or in public companies that are taken private to improve the performance, reconstitute operations and ultimately create long-term value. While public market investments – the purchase of shares listed on an exchange in a company, for example – private equity is focused on privates deals, where to varying degrees large ownership stakes are taken and active management may

become involved. Typically private-equity firms manage these investments, pooling capital from institutional investors and affluent individuals into organized funds.

Normal form A private equity fund is often structured as a limited partnership (LP model). Here, the GP is the private equity firm that finds, runs and exits investments. The investors are the limited partners (LPs) who invest money into the fund and are typically pension funds, insurance companies, sovereign wealth funds, endowments or family offices. They contribute the lion's share of the capital, albeit not involved in day-to-day management; all about that is seen in a general partner.

To Oliver, private equity isn't just about funding companies, "it's value creation". PE firms hope to revamp companies, improve corporate governance and prepare them for growth by infusing capital and expertise. Due to its long-term orientation PE is a crucial contributor to the broader transformation of businesses, innovation and job creation, and | 15 PEP Submission Regulatory Impact Analysis – Appendices Investment & impact investment flows.

### Key Characteristics of Private Equity

Here are terms that can help us to understand private equity investments:

- 1. Direct Investment with Significant Control
  - o Even more so than passive stockholders of public companies, PE investors usually acquire significant ownership positions and wield significant control.
  - o This power allows them to affect strategic choices, make management changes and guide the company toward long-term growth.
  - o Example: A PE buying 60% of a manufacturing company can install new leadership, upgrade production lines, enter new markets.
- 2. Long-Term Investment Horizon

o Private equity investments are generally not liquid, they cannot be readily sold or transferred. It is for a strategic time horizon of 5–10 years.

o This horizon allows firms reasonable opportunity to effect restructurings, growth priorities or financial recoveries.

o Example: Blackstone's investment in Hilton Hotels was held for more than seven if you include including three before being re-listed, pre-IPO transformation of the company on both an operating and a financial level.

- 3. Value Creation Beyond Capital

o PE firms do not just bring money to the table; they also deliver managerial know-how, efficiency gains, and governance changes.

o They typically bring in new technology, rationalize supply chains, reduce costs and venture into new markets.

o Case example: For a PE firm investing in a retail chain, they can upscale e-commerce platforms, customer analytics and further regional presence.

- 4. Exit-Oriented Strategy

o Private equity's principle focus is not on eternal ownership, however, a profitable exit.

o Common exit routes include:

☐ Initial Public Offering (IPO): Introducing the company on a stockmarket.

☐ Strategic Sale: The sale to another company, frequently in the same field.

☐ Secondary Buyout: Selling to Another PE Firm.

☐ Promoter Buy-back: The share is bought back by the initial owners.

o Example: Warburg Pincus had an exit in Bharti Airtel through public listing which yielded great returns.

- 5. High Risk–High Return Profile

o PE investments are higher risk than other investment vehicles because they invest in companies that might need substantial reengineering.

o However, profitable investments can produce very high results – often in the vicinity of 20-30% annually.

o Example: PE investments in Flipkart reaped rich dividends when Wal-Mart bought into a near majority in 2018.

- 6. Institutional Focus

o PE funds are not easy to access for small retail investors because of high minimum investments (usually in crores).

o Investors are typically large entities such as pension funds, sovereign wealth funds or endowments looking for long term investment opportunities with high return.

- 7. Diverse Investment Strategies

o Private equity is not one-size fits all; there are several types:

☐ Venture Capital (VC): Investment in early stage / startup companies.

☐ Growth Capital: Investment in established companies that are seeking to grow.

☐ Buyouts: Purchasing control of established companies.

☐ Distressed: Invests in companies or assets that are distressed.

#### 2.4.2 Role of Venture Capital and Angel Investing

Venture capital (VC) and angel investing are two important parts of the private equity pantheon that more precisely focuses on helping early-stage businesses and startups. The significance of these startups is that, even as they have innovative ideas and high growth potential, many find it difficult (if not impossible) to tap traditional sources of finance like bank loans or corporate debt. This is mainly due to the fact they do not have any collateral, their operating history is short and they operate in uncertain markets. The gap is filled by venture capitalists and angel investors, who don't just offer financing but also strategic guidance, mentoring and market access. In doing so, they are key drivers of innovation, entrepreneurship and overall economic progress.

#### Venture Capital

Venture capital is the name for professional investment by special funds in start-ups or young companies with high growth potential. VC firms typically raise money from institutional investors (endowments, pension funds, sovereign wealth funds and the like) and invest it strategically in fledgling businesses. The objective is

to realize a meaningful capital gain when the start-up grows or is sold to the public. Venture capitalists are different than passive investors, because they may have a more active role in shaping the direction of the company.

VC investment usually happens in stages:

- **Seed Stage:** Money is given when the company remains at the idea or prototype stage. The purpose is to validate, optimize the product and get some early market feedback.

For instance, a VC fund may extend ₹50 lakh to a health-tech startup working on an AI-based diagnostic tool.

**Early Stage:** Companies at this stage have a product market fit and the product is built, but lack resources needed to commercially launch. The risks remain extremely high, as many startups do not succeed at this stage, but so does the return potential.

- **Example:** Early VC investment in Flipkart enabled it to expand from an online bookstore to a diversified e-commerce powerhouse.

- **Expansion Stage:** The company at this stage has proven its business model is working and generates some revenue. VC capital is used for scaling production, increasing marketing activities and entering new markets.

**Example:** Zomato and Swiggy got big VC cheques in their expansion stage to expand into deliveries and get more customers.

## Angel Investing

Unlike VC, angel investing utilizes high-net-worth individuals (angels) who invest their own money into startups. Angels typically invest at the absolute earliest stage — often before even venture capitalists do — when the start-up is nothing but an idea or a prototype. They give much less money than VC firms, but their role is often life or death for a business to survive.

What makes angels so valuable isn't so much their money; it's also the mentorship, the experience and the networks. Most angel investors are successful entrepreneurs or executives

themselves, and they use their experience to help steer start-ups away from costly mistakes, fine-tune business models, and gain introductions to industry contacts.

For instance, Google obtained an initial angel investment of \$100,000 from Andy Bechtolsheim, one that enabled the founders to take steps toward their company's incorporation. In India as well, companies like Ola and Oyo owe much to their early days of angel funding.

Salient features of the venture capital and angel investment ecosystem

To make sense of their distinct duties, it is helpful to outline the special features that distinguish them:

- 1. Stage of Involvement

- o Angels will typically invest at the earliest stage possible, sometimes when the company is an idea.

- o Venture capital groups are looking for slightly more established businesses with a prototype or early revenue.

- 2. Source of Funds

- o Angels are investing their own money, looser but smaller.

- o VC funds are the accumulated fund raised from the institutions and large investors.

- 3. Investment Size

- o Angels give at smaller tickets (few lakhs to few crores).

- o VC Firms can invest significantly larger amounts, up to tens or even hundreds of crores in later rounds.

- 4. Involvement in Business

- o Angels serve as mentors and guides, drawing upon their own experience and networks.

- o VCs professionally supervise (edit operating form / Queen's Counsel would be my recommendation) – taking seats on Boards, capacity for governance and strategy.

- 5. Risk and Return Profile

- o Both are high-risk, high-reward. Start-ups can die completely, but they can also return exponential multiples of their cost.

- o Example: Early VC's in Byju's or Paytm made bulk of the money during their growth years.

- 6. Exit Strategy

- o Angels and VCs both seek exits with IPOs, we get acquisitions or secondary sales.

- o They are not there to own forever; they're there for capital appreciation.

### 2.4.3 Private Equity as a Tool for Portfolio Diversification

Investing would tell us that diversification is the only true “free lunch” in investing. The concept is to be diversified among various asset classes so a single winner or loser won't determine the fate of the entire portfolio. For decades, investors have used stocks and bonds for diversification. But these instruments are public market dependent, so investors are highly exposed to systemic risk factors such as inflation-shocks, interest-rates or global shocks. In

the largest sense, private equity (PE) can be seen as both a way of financing firms and an extremely efficient mechanism for achieving portfolio diversity.

What are some of the advantages that private equity provides? By targeting private enterprises, troubled companies and niche sectors of the market, investors can gain exposure to distinct growth engines that move independently from listed stocks and bonds. And PE returns are also less correlated with short-term market volatility that provides cushion in rough times. For long-term investors – think pension funds, sovereign wealth funds or high-net-worth individuals - private equity therefore acts as both an engine of growth and a guarantor of stability in the overall portfolio mix.

### Diversification Benefits of Private Equity

- 1. Low Correlation with Public Markets

- o PE returns are not always behaving on the same trend as stock market indices do. However, since the values of PE investments are re-evaluated with less frequency (quarterly or even annually) and considering company fundamentals rather than daily sentiment on the stock exchange.

- o This explains why in crash year private equity can be a relative safe haven.

- o Example: During the 2008 banking crisis, global equity indexes were plummeting, but it was not uncommon for PE-backed businesses to continue to perform strongly as they are not so reliant on short term market volatilities.

- 2. Access to Growth Opportunities

- o PE offers investors the opportunity to invest in high-growth private companies which are often not available through public markets. These can be family-run businesses in specialized sectors, or start-ups on the verge of growth.

- o It also gains exposure to decline in value-equity, with recovery potential.

- o Example: Investing in early stage renewable energy startups could bring a PE firm early exposure to a sector that hasn't yet had much of an impact on the public markets.

- 3. Enhanced Long-Term Returns

- o In the past, best-in-class PE funds have outperformed public equity indices like S&P 500 or NIFTY 50. PE is an investment class where patience dictates, but those supplying long-dated money are often rewarded with enhanced returns.

- o Example: Data from Preqin and McKinsey reports demonstrate that the top-quartile PE fund managed to deliver annualized returns of 15-20% in the last decade, which were much higher (8-10%) than public equities.

### Sub-Categories within Private Equity

And private equity is a diverse asset class with many ways to diversify within it. The main sub-categories include:

- 1. Growth Capital

- o Seeks relatively established companies with sound business models but that require capital for growth, product innovation or new market entry.

- o These investments are of moderate risk and the return is often more predictable than from startups.

- o Example: Funding a pharmaceutical company that is well established with expansion into international markets.

- 2. Buyouts

- o Includes purchasing controlling interests in companies that are already established, usually LBOs.

- o The approach revolves around the re-engineering of efficiency and reveal hidden value in operations & financials.

- o Example: Blackstone's buyout of Hilton Hotels, which was subsequently recapitalized and went public again for a substantial gain.

- 3. Distressed Investments

- o Target those businesses under the most severe financial stress. They are rarely worth much at the point of purchase; they are bought for a song and rehabilitated into money-makers.

- o Distressed investing is riskiest, but achieving a successful turnaround can provide outsized returns.

- o Example: PE funds that buy distressed steel companies in recessions and then rejuvenate them in periods of commodity upswings. And so on.

#### Private Equity in Diversification is Defined Aspects of Private Equity in Diversification

- Long Term Horizon: PE demands patient and long-term capital (7-10 years) provider which is aligned with investors who want to create long term sustainable wealth.

- Active Managers: Unlike passive investments in public equities, PE firms manage their funded entities and therefore can add strategic and operational value.

- Illiquidity Premium An investor is rewarded for putting money to work behind illiquid assets that might offer higher expected returns than public markets.
- More comprehensive exposure: Gain access to sectors, geographies and types of companies (privately owned businesses, troubled assets) which can't be accessed through public markets.
- Risk-Return Tradeoff: Though riskier than bonds and FDs, PE diversifies risk if combined with regular investments, reduces overall portfolio volatility.

#### 2.4.4 Risks and Exit Options in Private Equity Investments

Private equity (PE) is frequently acclaimed for its capacity to deliver superior long-term returns and change businesses while the risks and challenges are also acknowledged. And unlike conventional investments in stocks, bonds and fixed deposits, private equity involves large amounts of capital being locked in for long periods without liquidity until exit. The success of a PE investment is not just dependent on generational market trends, but also the operational performance of the company underneath. That is why investors must, before investing money: measure the potential reward against the risk weigh (weigh) different exit strategies that determine the final profits.

#### Major Risks in Private Equity

- 1. Liquidity Risk

- o Illiquidity is probably the most cited difficulty in a PE investment. Unlike publicly held stocks, which can be sold at any time, private equity investments are “illiquid,” or locked up for long horizons — usually seven to 10 years. Investors should therefore be willing to accept a certain amount of illiquidity.

- o Example: A pension fund that invests in a private equity buyout may need to wait for almost 10 years prior to making any upcharge, depending on the exit conditions.

- 2. Business Risk

o The performance of the portfolio company has a significant impact on the PE investment outcome. Bad management decisions, strategic errors, technological upheaval or consumer behavior shifts can all lead to a substantial loss of value.

o Example: A private equity firm that invested in a brick and mortar retail had to deal with the rapid build-up of e-commerce, undermining traditional retail models" ("Harvard Business Review")

- 3. Market Risk

o Economic and industry cycles play a large role on PE results. Even companies that are well run may be hurt if an economic downturn saps demand, distresses valuations or puts off IPOs.

o For example: Most were trapped in investments and unable to exit during the global financial crisis with depleted valuations and so holding periods became extended.

- 4. Concentration Risk

o Mutual funds which tend to own collections of dozens or hundreds of securities versus PE portfolios are focused, and may only have a handful of companies. This multiplies the consequences of a failure.

o Example: If one large investment in a PE fund gets crushed, such as a heavily leveraged telecom venture, the returns of the entire portfolio may be deeply wounded.

The combination of these risks illustrate that private equity is not an appropriate investment for everybody; it works most effectively for institutions and sophisticated investors with a long-term view, a high tolerance for risk, and the ability to absorb losses.

### Exit Options in Private Equity

Making a successful exit is the endgame for all private equity investing. A good exit not only recovers investment but returns large profits, compensating the investor for years of illiquidity and risk. Some of the most popular ways to exit include:

- 1. Initial Public Offering (IPO):

- o The company is publicly listed so the PE firm can offload its stake to public investors. If the timing in the market is good, IPOs can deliver big returns because they offer liquidity and high valuations.

- o Example: Blackstone's IPO exit from Hilton Hotels in 2013 yielded billions of profits after holding the investment for seven years.

- 2. Trade Sale:

- o The company gets sold to a peer in the sector—a firm with which there are overlaps or synergies, rather than converting into another publicly traded mutual fund. This can be faster and less risky than an IPO as it's a private negotiation.

- o Example: PE firm that is selling a healthcare chain to a multinational pharmaceutical company The post News four appeared first on XtraPlan.

- 3. Secondary Sale:

- o The PE firm exits and sells down its shares to another PE investor or a financial institution. This is a way to get liquidity without being in the public market.

- o Ex] Warburg Pincus sold a portion of its holding in Bharti Airtel to another institutional investor prior to the IPO of the company.

- 4. Buyback by Promoters:

- o In such a case, the original owner/promoter re-buy stake from PE firm. It most commonly occurs when the company has restored itself to financial health and desires a takeover.

- o For e.g., mid-cap companies in India being promoted would prefer to buyback shares once operations have settled post PE kind of intervention.

### Importance of Timing and Execution

The timing of the exit plays a central role in how successful a private equity investment is. An impressive portfolio company may still post disappointing returns if exited in a market downturn. Conversely a well timed IPO or trade sale within benign markets can enhance returns substantially. Execution matters as well: structuring the deal, negotiating with buyers and preparing the company for listing or sale takes experience and skill.

### 2.4.5 Institutional vs Retail Access to Private Equity

1 Private equity (PE) is considered to be a high return, high risk asset class with an important role in the global capital markets. Yet PE remains unevenly accessible. The space is controlled by big institutional investors, and retail ones are discouraged in many ways from getting involved. This dichotomy arises from variations in economic resources, regulatory environment and expertise together with the characteristics of PE as an illiquid and complex investment product.

#### Institutional Access to Private Equity

The investors in the private equity market are conventional, long term composite holdings of institutional investors, including pension funds, insurance companies and university endowments. They have some advantages that make their access way easier:

- 1. Financial Strength and Long-Term Horizon

o Institutional investors oversee huge sums of money and can make commitments in the hundreds of millions to private equity funds.

o Because they are investing with long term (retirement payout for defined benefit pensions, preservation of wealth in the case of endowments) in mind, they can withstand the PE style 7-10 year lockup periods.

o Example: Each year the Canada Pension Plan Investment Board (CPPIB) and Abu Dhabi Investment Authority (ADIA) contribute billions to global private equity funds.

## • 2. Professional Expertise and Due Diligence

o There are institutions with analysts, fund managers and consultants who do nothing but due discipline before they committing capital.

o They are well-positioned to continually track portfolio companies, market risks and the overall portfolio, allowing them to invest across a number of funds, industries and geographies.

o That avoids concentration risk, which for small investors is not a simple task to achieve.

## • 3. Access to the Best PE Firms

o The first funds of many top private equity firms (example – Blackstone, KKR and Carlyle) are focused on large institutional investors in which they may require significant minimum investments.

o This exclusive access means that these institutions get access to the most lucrative and rarest opportunities, which smaller investors can't get too without going through blockchain.

In combination, these aspects render institutional investors as not just dominant, but also most able to profit from the nature and requirements of private equity.

### Retail Access to Private Equity

For typical investors, private equity is much more limited. The barriers are twofold: structural (they typically have high investment minimums and are illiquid) and regulatory (the protection of unsophisticated investor).

- 1. High Entry Barriers

- o The majority of private equity funds need minimum commitments in the millions, which is definitely not accessible to ordinary investors.

- o This effectively rules out direct participation for retail investors and leaves them no choice but indirect options.

- 2. Limited Access Through Intermediaries

- o There were new ways of retail participation due to financial innovation, as outlined recently:

- ☐ Feeder Funds: Small-scale investors pool money into the fund that, in turn, invests in a large PE fund.

- ☐ Funds of Funds (FoFs): Pooled funds that invest in more than one PE vehicle, giving indirect exposure.

“Wealth Platforms:” Certain digital investment platforms now enable accredited investors to invest lower dollar amounts in vetted PE deals.

- o Although these channels have reduced the threshold to entry, they generally come with layers of extra fees

and less control over the underlying investments.

- 3. Regulatory Restrictions

- o Authorities in markets globally place limits on retail investors' access to high-risk, illiquid products.

- o For instance, “accredited” or “sophisticated” investors—people with high income, high net worth, and financial sophistication—are the only ones who can invest directly in PE funds.

- o While this secures the investors, it also makes less accessible for others.

- 4. Growing but Modest Participation

- o While there have been developments in this area, it has, until recently, only served as a small pocket of the market with under 10 percent of companies partaking.

- o In the U.S. and Europe, accredited investors can invest in certain structured products that are pegged to PE but on a small scale. Even in India, access to retail PE is at an evolving stage, which has so far been largely through the vehicle of venture capital funds or AIFs.

### Institutional Dominance vs Retail Challenges

The chasm underscores the elitism inherent in private equity. It's dominated by institutional investors because they happen to be perfectly suited to the asset class's needs: patience, deep pockets and professional oversight. (Although they are not always successful as large financial institutions expect their funds to outperform the market, but I digress.) Retail

investors on the other hand rarely have appetite for extreme risk, illiquidity or complex deal structuring.

But the shape of things is starting to change:

- **Financial Innovation:** New types of services are experimenting with units of tokenized private equity, enabling fractional ownership and reducing minimum entry sizes.
- **Eased Regulation:** Some places are starting to lift rules so more people can participate, as long as certain investor protections remain.
- **Democratization Trend:** With wealth and digital platforms expanding around the world, the distinction between institutional access and retail consumption might get blurred (carefully though).

### Knowledge Check 1

Choose Correct Options:

1. Private equity investments are generally characterized by:
  - a) High liquidity
  - b) Long lock-in period
  - c) Guaranteed income
  - d) Daily trading
2. Venture capital primarily supports:
  - a) Early-stage startups
  - b) Mature listed firms
  - c) Government projects
  - d) Real estate only

- 15
3. Which of the following is a common private equity exit route?
- a) IPO
  - b) Bank loan
  - c) Savings deposit
  - d) Insurance claim
4. Angel investors are usually:
- a) Wealthy individuals
  - b) Mutual funds
  - c) Government agencies
  - d) Pension funds
5. Retail investors face barriers to private equity because of:
- a) High ticket size
  - b) No risks
  - c) Tax exemptions
  - d) Daily NAV

## 2.5 Summary

⊘ Old school investment options like FDs, bonds, equities, PPF, NSC – are only concerned about safety of capital, and consistent returns.

⊘ Fixed Deposits offers stable interest earning with low risk but may not match the inflation level.

⊘ Bonds Many consider bonds to be IOUs and they vary in terms of risk (i.e. the promisor) from issuer to credit values.

⊘ Owning stocks gives you ownership and long term success potential, but is VERY volatile in the short run.

⊗ PPF and NSC – Government-supported savings schemes with assured safety and tax advantage.

⊗ Alternative or less traditional investments are mutual funds, ETFs, REITs, commodities, hedge funds and exchange-traded notes.

□ Mutual funds combine the investments of many in a diversified portfolio, while ETFs merge mutual fund diversification with stock-market tradability.

⊗ REITs offer access to commercial real estate ownership on a large scale without the need of property ownership.

⊗ Gold, oil and other basic products or assets such as agriculture assets offer portfolio diversification and could serve to hedge against inflation.

⊗ Hedge funds and products are complex instruments intended for sophisticated investors and institutional investors.

⊗ Private equity is invested in privately owned companies and there are various strategies from venture capital to buyout investments and distress investing.

Private equity also involves risks, including the illiquidity, concentration and business risk of traditional private companies whose exits are planned through IPOs, trade sales or secondary sales.

## 2.6 Key Terms

Fixed Deposit (FD): A financial instrument which involves depositing money for a predetermined period at an agreed interest rate.

2 Bond: A fixed-income obligation representing a loan made by an investor to a borrower, such as a corporation or government.

Equity: Stock ownership in the company, representing a claim against that corporation's assets and profits.

PPF (Public Provident Fund): A government established long-term savings scheme which is tax exempt and offers assured returns.

NSC (National Savings Certificate): A small savings scheme with a fixed interest rate along tax savings under Section 80C.

Mutual Fund: An investment vehicle that is a pooled based outlet, professional managed, that moves cash into a variety of securities.

1 ETF (Exchange Traded Fund): A marketable security that tracks an index, a commodity, bonds or a basket of assets.

REIT (Real Estate Investment Trust): A company that operates income-generating real estate properties and pays out dividends in the form of earnings.

Commodities: Physical goods such as gold, oil and crops that are traded in financial markets.

Hedge Fund: A promoter of an investment fund that uses aggressive strategies with high risk to try and achieve a high return.

Structured Product: Tailored financial products, originating from a combination of options or swaps and securities.

Private Equity (PE): Investment of capital in private companies to improve their operational performance and for further profitable exits.

## 2.7 Descriptive Questions

Explain the characteristics, returns and safety net of fixed deposits.

Outline various bonds and the types of risk and return associated with each.

Assess the place of stocks in wealth generation and emphasise their risks and potential rewards.

Explain the nature and advantages of mutual funds as nonconventional investments.

Discuss the ways in which REITs offer access to the real estate markets for small investors.

Examining the benefits of adding commodities to an investment portfolio.

What are the downsides to private equity investing and how can investors exit?

Contrast access to private equity as between institutions and retail, with appropriate real-world cases.

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### Knowledge Check 1

1. b) Long lock-in period
2. a) Early-stage startups
3. a) IPO
4. a) Wealthy individuals
5. a) High ticket size

### 2.9 Case Study

The state of the health industry in India has evolved to become one of the fastest growing industries, with an expansion and diversification that is precipitated by increasing income

levels, lifestyle diseases and a growing demand for quality medical services. But, ironically, this growth has also brought funding issues for hospitals, diagnostic chains and specialty clinics. Private equity (PE) has become a major force in filling this void, offering healthcare companies long-term capital and strategic and operational support.

One example is the global private equity investment in mid-sized hospital chains in India. Most of these hospitals were small and family-run, had no sophisticated management structure in place, and faced capital restraints in terms of expansion. PE funds came to the rescue and not only brought in money but professionalized operations, introduced cost rationalization processes and instilled governance standards.

### Key Developments through PE Involvement

- Hospitals could scale their network to tier-2 & tier-3 cities and fill in the gap of quality health care beyond metros.

Capital was used to upgrade technology and expand options for telemedicine platforms, electronic health records and diagnostics.

- PE investors hired seasoned managers, strengthening governance, financial control and operational performance.
- Global care provider partnerships were established, which increased credibility and the level of service.

### Problem Statements

**Financial Constraints to Growth:** Midsize healthcare chains did not have adequate capital to grow and purchase the latest medical technology.

**Operational Inefficiencies:** Mom-and-pop hospitals employed to the inefficiency of staffing, procuring and governing themselves which led to less profits.

Exit Challenges for Investors: Private equity funds needed to have an exist strategy in place, but healthcare IPOs were mixed over this period, and there was little trade sale activity.

## Solutions

Funding Finders: Private equity offered multistage funding to suit expansion. For instance, investments would be in tranches based on performance milestones, and so they were sure that the money would be spent wisely for expansion to new cities and improvement of facilities.

Operational Enhancements: Investors introduced standardized operational systems, professional management and technology to streamline supply chains and patient care. That lowered costs and increased patient satisfaction.

Exit Paths: Given difficult IPO markets, other exit alternatives were considered including acquisitions by larger hospital chains or sales to global healthcare investors. Multiples such as the abovementioned KIMS reported successful exits when hospital groups operating globally bought Indian companies backed by private equity money.

## Reflective Questions

Why is private money in general but specific to healthcare, then it seems that private equity-type structures are especially conducive?

How do PE funds add value to family businesses other than financial capital?

What risk do PE funds take on when they invest in health care and how can they hedge that risk?"

With no IPOs in sight, what new exit machinations are available to PE in the developing world?

## Conclusion

PE in Indian Healthcare Space Private Equity in the Indian healthcare sector is a classic example of how PE funding involves much more than merely financial support, and adds strategic, operational, governance uplift to the target entities. It has been both profitable and socially impactful as private equity updated outdated practices, democratized access to regions, and filled a void in financing. However, exit challenges and

sector-specific risks remain significant. For investors, it is about striking the right balance between capitalizing on commercial opportunities and adapting to the specific needs of healthcare; for companies, it means private equity takes you to a new level where growth becomes manageable.

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## Unit 3 Understanding Investment Portfolios

### Learning Objectives

1. Define what an investment portfolio is and explain its purpose in personal and institutional finance.
2. Identify the major asset classes (e.g., stocks, bonds, real estate, commodities, cash equivalents) included in portfolios.
3. Differentiate between diversified and non-diversified portfolios.
4. Analyze the risk-return tradeoff in investment decisions.
5. Explain the role of asset allocation in achieving investment goals.
6. Evaluate portfolio strategies such as conservative, balanced, and aggressive approaches.
7. Illustrate how external factors (e.g., economic trends, inflation, interest rates) affect portfolio performance.
8. Apply basic principles of portfolio management to construct a sample investment portfolio.
9. Assess the importance of monitoring and rebalancing a portfolio over time.

### Content

- 3.0 Introductory Caselet
- 3.1 Relevance of Portfolio Construction
- 3.2 Types of Investment Portfolios
- 3.3 Risk Pooling and Mitigation through Portfolios
- 3.4 Objectives and Benefits of Forming a Portfolio
- 3.5 Summary
- 3.6 Key Terms
- 3.7 Descriptive Questions
- 3.8 References
- 3.9 Case Study

### 3.0 Introductory Caselet

32-year-old Ananya, an IT professional, has worked hard to make a good life and build her career. In the last ten years, she has managed to save ₹15 lakhs, but in her savings account and fixed deposits only. The fact that she has these savings is comforting, but she's also aware that the returns are modest and perhaps not enough to reach her long-term goals.

Ananya's major financial objectives are:

- To purchase a home in the next five years.
- At the age of 60 a comfortable retirement to achieve.
- To build wealth steadily and avoid taking on unnecessary risks.

When she goes to see a financial adviser, he tells her about this thing called an investment portfolio -- it's a basket of assets such as stocks, bonds, real estate and gold that can be put together in various ways to balance risk with return.

The adviser emphasises the need for diversification, and points out that if she only invested in low-risk instruments such as fixed deposits, it could keep her money safe on one hand but not give her any growth to help achieve her long-term goals. On the other hand, being too heavy in equities could put her at risk of market volatility that could influence a not-too-distant goal to purchase a home.

In order to assist in making this decision, the adviser offers three portfolio strategies:

#### Conservative Portfolio

- o 70% bonds and fixed deposits

- o 20% gold

- o 10% equities

Specifically created to provide stability with some capital appreciation.

#### Balanced Portfolio

- o 40% equities

- o 40% bonds

- o 10% gold

- o 10% real estate

A half-measure of risk and growth prospects.

Aggressive Portfolio

- o 70% equities

- o 20% bonds

- o 10% other assets (REITs, commodities)

Long-term growth oriented but very high short term volatility.

Now Ananya faces a crucial choice: Should she prioritize safety and capital preservation, or should she embrace more risk for the prospect of higher returns? That will determine just how closely her portfolio matches up with her objectives, her risk tolerance and her time horizon.

Critical Thinking Question

If you were Ananya, what portfolio strategy would you select and why? Re: What to do with my mother's money You respond by discussing how [her daughter]'s time frame, risk tolerance and investment goals should shape the decision-making.

### 3.1 Relevance of Portfolio Construction

A portfolio is a well-thought-out combination of investments that match most closely an individual investor's financial objectives, personal finances and level of income, age and willingness to take risk. It is also very important to the investors as they can maximize their

returns, conserve capital, preserve liquidity and protect themselves from unexpected risks and in turn leading to systematic creation of wealth.

### 3.1.1 What is an Investment Portfolio?

An investment portfolio is a collection of assets that an individual, household, or company owns in order to achieve various financial goals. It's not just a mishmash of investments but rather an engineered, thoughtfully constructed system in which every asset has its job to do. Bringing together shares, bonds, money market instruments, property and gold or any other asset class in the portfolio allocates them based on an investor's risk appetite and his unique personal financial situation.

The primary attribute to a portfolio is that its risk is diversified and spread across different instruments. For example, stocks can yield great returns with volatility, and bonds offer predictable income but less growth. By doing so you attempt to minimize the market variation and avoid financial hell. In addition, the fact is that portfolios are never set in stone and should be revisited on a regular basis to accommodate changes in market/economic circumstances, changing financial obligations and life phases. A young investor may have more equities for longer-term growth, while a retiree would opt for safer income-generating assets.

When construct an investment portfolio, a risk-return balance is needed. Others are more aggressive and overweight equities in a more balanced type portfolio. The types of investments in a portfolio can also range from simple allocations among savings deposits and bonds to an array of mixes that may include real estate investment trusts (REITs), hedge funds, or even cryptocurrencies.

In other words, portfolio is the financial lifeblood of wealth management. This isn't just about owning this and not that, but rather thoughtfully allocating those things in a way that lines up with the investor's goals, income patterns and comfort with uncertainty. If another investor doesn't have a portfolio, they may run the risk of being exposed to changes in value for volatile investments or failing to grow wealth enough for future financial needs.

### 3.1.2 Purpose of Constructing a Portfolio

Building a portfolio is not just about putting money in. It is a disciplined approach to ensuring assets are allocated based on goals and not exposed to risks and market conditions. A portfolio, then, ensures that financial planning is orderly, target-oriented and robust.

The most critical of those reasons is risk spreading. Bond, gold & real estate Assets can offer diversification to portfolio By splitting assets into a variety of segments including stocks, bonds, gold and property a portfolio can mitigate the risk if there is negative performance in any one segment. For instance, in the course of stock market crunch, government bonds or gold could hold its value or go up, thus stabilizing investor's wealth. This is what makes a portfolio much more reliable than any single investment.

Another objective is financial success. Each person has different goals, reasons for a home purchase, educational funding, retirement savings and emergency fund establishment. You can invest according to time horizons using a portfolio. Short-term goals are underpinned by safe and liquid assets; medium-term goals with moderately risky assets, and long-term goals with fast-growing instruments such as equities.

Capital preservation is equally important. Investors often place a premium on protecting their principal, particularly as they near retirement or other significant financial responsibilities. Portfolios protect the initial capital by investing in safe vehicles such as treasury bills or deposits, and at the same time seek growth with those investment options too. Meanwhile, portfolios help us to create wealth. By staying disciplined in adding to your pot and then reinvesting gains, compounding has a great effect on wealth over time. A balanced portfolio can protect current savings while growing them for the future.

Liquidity is another purpose. Sometimes life's unexpected moments require ready access to cash right away. Furthermore, the instrumentative liquidity of investors who are not forced to sell their rate insensitive portfolios prematurely, because of savings deposits or money market funds for example. Moreover, customized portfolios can also be tailored to ensure the highest level of tax efficiency by taking into account appropriate instruments that will allow reducing taxable income for investors.

And perhaps most important, a good portfolio gives you peace of mind. No single market event will ever completely decide their fate, which gives investors the sense of emotional security you describe. In this way, building a portfolio is as much a financial as it is an emotional firewall.

### 3.1.3 Role in Achieving Financial Goals

The investment portfolio is the crux of attaining one's or an organization's financial objectives because it links goals to a strategy to achieve them. By thoughtfully diversifying resources on a systematic basis, the portfolio allows one to follow goals with minimum risk.

Goals will vary according to the stage of life. Young people, who have more of a time horizon ahead of them, can take on the portfolios heavy in equities that can grow the most aggressive. For middle-aged people, it's often about balance — securing certain responsibilities (children's education) while still contributing toward retirement. Retirees instead favour portfolios focussed on capital protection and a regular income. The portfolio thus automatically adjusts to the stage of life of the investor.

You can also classify goals by when they should happen. Short-term goals — a vehicle purchase, travel savings — necessitate safe, liquid assets. Medium-term goals — like buying a home or sending a child to college — require a mix of stability and growth, typically delivered by balanced mutual funds or bonds. Long-term wants and goals — like retirement — depend to a large extent on growth-oriented assets such as stocks in order to outperform over long periods even with the short-term volatility.

One of the primary purposes of the portfolio is to allow for methodical accumulation of wealth. By making consistent contributions, practicing disciplined savings and reinvesting your returns, the power of compounding can grow wealth over decades. Even small monthly amounts invested can with time become decent sums as they are managed within a properly diversified portfolio.

The portfolio is a hedge against inflation as well. As costs rise, the purchasing power of money diminishes — and yet assets like stocks and real estate typically compound at a rate that is higher than the rate of inflation, meaning that it grows in nominal terms faster than prices do, which protects the investor's real wealth. Moreover, portfolios are not static. They need to be kept on top of and rebalanced frequently to make sure your asset allocation reflects your goals. For example, they move out of equities and into bonds as retirement approaches to salvage what has been accumulated.

### Did You Know?

“Constructing and managing a well-diversified portfolio can help an investor potentially achieve multiple financial goals simultaneously, such as wealth creation, retirement planning, and education funding, while still protecting against unforeseen market risks and inflationary pressures.”

#### 3.1.4 Factors Influencing Portfolio Design (Age, Income, Risk Appetite)

Portfolio construction is very personal, and the individual who is structuring his financial balance sheet must look at his own abilities as an investor and to some degree the current macro environment in which he operates. A well designed portfolio is not only contingent upon the investor's financial strength, but his emotional comfort with risk, future liabilities and then it's about market conditions. No two portfolios are the same, as they all need to be tailored to an individual's life stage, income level, risk tolerance and goals.

##### Age and Life Stage

Age continues to be one of the most critical triggers for portfolio composition. The further away an investor is from retirement, the longer they have to recover from short-term losses and take advantage of the compounding of high-growth assets. Older investors on the other hand, when investing more for capital preservation and income growth.

- Young Investors (20s–30s)

Given long investment horizons, they can tolerate aggressive, equity-heavy portfolios. For instance a 25-year old professional may allocate 80% to equities (domestic and international ETFs), 10% to debt (short-term bonds) and the remaining 10% in gold as hedge. More short-term volatility is less concerning because the concentration is on long-term wealth creation.

- Mid-Life Investors (40s–50s)

At this point, investors balance growth with security to fulfill family obligations like their children's education or paying off the mortgage. A well-rounded portfolio could look like 50–60% in equity, 30–40% in debt, and the remaining 10% in gold or real estate to enable diversification.

- Retired or Near-Retirement Investors (60+)

Here the emphasis is on safety, liquidity, and income. A retired individual may have 70–80% in fixed income (bonds, deposits, annuities), 10–15% in stocks for growth with limits, and then finally 10% in gold to keep value.

#### Income Levels

Ability to invest and ability to bear risk are both functions of income. You will see that wealthier investors can afford to invest in alternatives or illiquid assets and less wealthy individuals are seeking liquidity.

- High-Income Investors

What's more, with excess wealth they can experiment with real estate, hedge funds, private equity or international equities in addition to (traditional) assets. For example, a high-earning executive may build a portfolio that consists of 40% equity, 30% debt, and 20% real estate with the remaining portion going into alternative funds.

- Moderate-Income Investors

Usually build relatively safe portfolios, though never in the pursuit of gains. For instance, a stable middle-class IT employee may hold 60% equities, 30% debt and only a few per cent gold to balance the return against risk.

generation with protection against shocks.

- Low-Income Investors

Focus on liquidity and capital preservation. For the young worker, for example, spending only 70 per cent in bank deposits and government securities, 20 per cent in gold and merely 10 per cent in community service may be enough.

equities, since the capacity to endure losses is constrained.

### Risk Appetite

A ready acceptance of doubt on the part of the investor as to what the future holds is, in this regard, every bit as important as financial capability.

- Aggressive Investors

They also invest in stocks, emerging market ETFs and high-growth sector funds get access to the hot sectors. Example: A 30-year-old entrepreneur might invest in 90% equities (tech and small cap funds) with 10% invested in gold, embracing wild swings for the potential of high returns over the long term.

- Moderate Investors

Like to hedge their bets; frequently maintain equal or near-equal positions in stocks and debt. Example: A 40-

, a 51-year-old school teacher may be comfortable with more than half of her portfolio split between stocks and bonds, along with some gold to protect against inflation.

- Conservative Investors

Value capital protection above returns. Example: A retired person could hold 80% of their

portfolio in fixed income

(govt securities, fixed deposits), 10% gold and 10% equities, to provide income with low volatility.

Time Horizon of Goals

When you need to achieve a particular financial goal, before or after retirement, also influences where to place your assets.

- Long-Term Goals (20+ years)

Like retirement for a young professional, let portfolios stay tilted heavily to business equities and the enterprise of growth.

- Medium-Term Goals (5–10 years)

Like purchasing a home, they also require diversified portfolios with holdings of both equities and debt.

- Short-Term Goals (1–3 years)

Involve high liquidity, low risk if not loss and can be in debt or deposits examples are travel or emergencies.

Financial Responsibilities

Large responsibilities tie the hands of risk-takers.

- Someone with student debt, medical bills or dependents will need a more conservative asset mix that focuses on safety and liquidity.

Yet a family man with mortgages and mouths to feed does have something to lose. Similarly, an investor without debt nor much in the way of responsibilities can afford to become aggressive with his risk profile.

### Economic and Market Conditions

There are also exogenous variables that impact portfolio construction. Inflation, interest rates and business cycles dictate which assets do well.

- High Inflation → Equities and commodities (such as gold) are favoured, due to maintaining purchasing power.
- Falling Interest Rates → Debt securities break out, since the price of a bond is higher when its yield is lower.
- Recessionary Phases → Government securities and gold are going to be a saving grace while equities take it on the chin.

During India's 2016 demonetization, for example, stocks showed volatility while gold and debt provided stability. Likewise, amid the outbreak of the 2020 pandemic, Nifty 50 tumbled but gold rallied and spared diversified portfolios.

### 3.1.5 Portfolio vs Single Investment Approach

Investors commonly have the option to diversify a portfolio or concentrate into one investment. Comparison – why the portfolio method is best The reason for most people is plain in the comparison.

The portfolio method reduces the risk of investing by placing money in a variety of asset classes. This limits the potential for catastrophic losses in downturns. It also jibes with various objectives all at once: short-term liquidity, mid-term obligations and long-term wealth building. Portfolios will grow more stable as the stronger performance in one area

offsets the weakness in another. They are nimble and can be regularly rebalanced to adjust with changing times, maintaining relevance over time.

The single investment route is easier provident fund of india 31 to be more efficient for your investment as you only need concentrate on one particular instrument eg. equities or real estate or deposits. While this can lead to large profits when the position is favourable, a wrong move could mean substantial losses for the investor. It also does not have the flexibility of addressing multiple objectives. For instance, Money may be made on property over several decades but is not made liquid in case of emergency. Deposits can also preserve capital but do not necessarily produce long-term growth.

The portfolio approach is clearly more successful when contrasted with comparative exercise. It optimizes growth and security, enables the pursuit of multiple objectives at once and counteracts market uncertainty better than any other asset class. The one-trick-pony way of investing, which has its virtues for sophisticated and high risk takers is not designed for the bulk of people who just want to build financial security over time.

### 3.2 Types of Investment Portfolios

Investment portfolios are not uniform; they differ according to the investor's financial objectives, time horizon, and tolerance for risk. Some portfolios are designed to maximize growth, while others focus on safety, regular income, or specific sectors. Understanding the various types of portfolios allows investors to choose the approach that best aligns with their financial profile and aspirations.

#### 3.2.1 Aggressive Portfolio: High-Risk, High-Return

An aggressive portfolio is designed for investors who are comfortable with intense volatility- and pursuing greater wealth over the long term. And unlike other conservative/balanced approaches, it directs most of its capital to growth-related assets, particularly stocks. The core idea is that even as short-term, the nextProps will differ from firstProps.

losse"s can be both big and frequent, but in the long-run, earnings may easily surpass inflation and less risky investments such as bonds or deposits.

This type of portfolio is a great fit for investors who are young, high-earners or have long-term investment time horizon. For example, a professional in their late 20s who is saving for retirement that's three decades away can stomach short-term market crashes because they have plenty of time to rebound and take advantage of compounding.

### Starting with a Core of an Aggressive Portfolio

- Equities and Equity-Oriented Funds

The portfolio is mostly in stocks (usually 70-90% on average). In equities, diversification is maintained across:

- o The Large cap shares (like Reliance Industries, HDFC Bank, Infosys) for their stability and consistent returns.

- o Mid-cap stocks (like Mphasis, Aurobindo Pharma) that manage the trade-off between growth and volatility.

- o Volatile, yet with a higher growth potential by smaller stocks (e.g., niche technology and renewable energy enterprises).

- Alternative Investments

A tiny portion will go to hedge funds, private equity or emerging market funds,%".

which are more risky but potentially extraordinary profitable in the long term. For example, some MA funds may provide no more than for their employees, so if you want to make retirement a reality, save money in an and contributions as well.

available in domestic markets.

- Low Allocation to Debt

Bonds, short-term debt funds or fixed deposits account for just 5-10% of the capital hold. (Not for growth, but to preserve a modicum of liquidity and stability in the event of market upheaval.)

Sample Aggressive Portfolio (30-Year-Old Investor)

- Equities: 80%
  - o 40% Large-cap Index fund (e.g, Nifty 50 ETF)
  - o 25% Mid-cap mutual fund
  - o 15% Small-cap stocks/ETF
- Alternatives: 10%
  - o 5% Global technology ETF (like the Nasdaq 100 ETF in India)
  - o 5% Private equity/VC fund (for high-net worth investors)
- Debt: 10%
  - o ST Debt fund or Gsec for emergency liquidity

This is a very aggressive type of portfolio and if equities do fall 30–40% during a crisis, that person needs to be ready for major short-term paper losses.

Advantages of an Aggressive Portfolio

- Potential for High Returns

India has seen 10-15% real returns from an equity dominated portfolio long-term, which is much more than what is available on a FD or bond.

- Inflation Beating

These portfolios help protect purchasing power, since they typically offer returns that outpace inflation by a good margin.

- Participation in Growth Sectors

Grants exposure to sectors experiencing rapid growth such as technology, pharmaceuticals, renewable energy and emerging markets.

### Challenges and Risks

- High Volatility

Day to day, month to month or even year to year variation can be large. For instance, in the financial year 2008-9, during the global financial crisis in India when equity indices lost more than half its value and aggressive portfolios were eroded to the extent of 50 per cent.

- Requires Long-Term Commitment

Returns are achieved in decades, not short spurts. The investors who take it out early frequently end up crystallizing a loss.

- Behavioral Pressure

You need to be emotionally tough with aggressive portfolios. Most investors freak out

during crashes and sell when it's too late.

- Active Monitoring

"Because [the investors] have a large allocation to equities and alternatives, their portfolio needs regular review, rebalancing and in some cases professional advice," advised Monevator.

### Investor Suitability

An aggressive portfolio may not be right for everyone. Investors it is for Best for what Types of investments Selection cost Account fee WEBULL Read Full Review Webull **4.0 NerdWallet** rating NerdWallet's ratings are determined by our editorial team.

- Have a time horizon of 15 to 30 years or longer.
- Have steady sources of income, so they don't have to sell investments in a downturn.
- Can stomach steep short-term losses without panicking and selling.
- See wealth creation as the main aim, not income or security.

### 3.2.2 Defensive Portfolio: Capital Preservation Focus

And so, a defensive portfolio is one which seeks to protect the downside rather than chase high growth. The objective is to preserve the investor's investment and provide a regular, stable source of income. These types of portfolio can be particularly important for those with low tolerance to risk or at a stage in life where financial security is more important than building wealth over time.

An investor will usually select a defensive position if they are a retiree, near-retirement investor or have large short-term financial commitments like education and medical needs.

Because these investors do not have the ability to take large losses or long recovery periods, we intentionally build a conservatively allocated portfolio.

**Defensive Portfolio Key Takeaways** A defensive portfolio is a collection of assets that tends to be less sensitive to the swings of the economy.

- High Allocation to Debt Instruments

Most of the portfolio (typically 60–80%) consists of government bonds, treasury bills, fixed deposits and high-rated corporate bonds. These instruments provide steady, predictable returns and exhibit much less volatility than stocks.

**Illustration:** Let's say that a 65-year-old retiree wants to allocate around 70% of his portfolio to RBI bonds and SDLs, bank deposits for dependable income stream.

- Stable Dividend-Paying Stocks

A portion can be invested in blue-chip companies with strong dividends records to provide some downy growth and income substitute.

**Example:** Defensive stocks like ITC, Hindustan Unilever, and Infosys tend to give regular dividends, too, and offer some cushion in a bear market.

- Minimal Exposure to Equities

And to the extent that stocks are involved, they typically come from defensive sectors such as health care, consumer staples or utilities, which tend to hold up better in recessions.

**Example:** An investment professional could direct 10–15% of a portfolio to both healthcare ETFs and consumer staples stocks which would provide exposure to equities without an undue level of risk.

- Liquidity Reserves

You retain cash and cash-like equivalent for emergencies in the form of savings accounts, money market funds or liquid mutual funds. These reserves are available to investors instead of selling long-term assets in times of crisis.

Sample Defensive Portfolio (for a 65-Year Old Retiree)

- Debt Instruments: 70%

- o 40% in sovereign securities(long term G-Secs, SDLs)

- o 20% will be invested in FDs and RDs

- o 10% in AAA-rated corporate bonds

- Equities: 15%

- o 10% in blue-chip dividend paying companies ( Infosys, ITC etc.)

- o 5% in defensive sector ETFs (like healthcare or FMCG funds)

- Gold: 10%

- o Gold ETFs / sovereign gold bonds as an inflation hedge and for crisis hedging

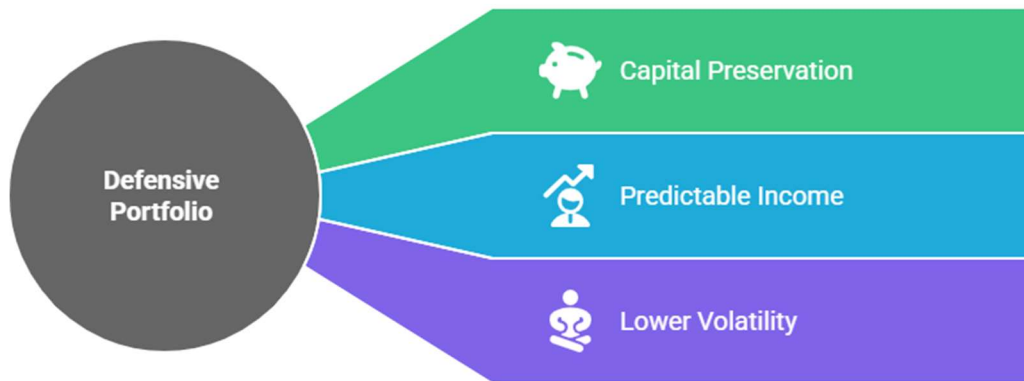
- Liquidity: 5%

- o Money market instruments/ liquid funds for contingency needs

The emphasis here is on income and safety -- with a little bit of upside through careful select and holds in stocks (and gold).

## Benefits of a Defensive Portfolio

### Unveiling the Benefits of a Defensive Portfolio



- Capital Preservation

Preserve original principal, shielding investors from potential significant market decline.

- Predictable Income

Debt and dividend funds provide predictable sources of cash that works well for those living off their investment income.

- Lower Volatility

The pain in the market less with defensive portfolios, so they are more digestible in terms of emotional wellbeing and life style.

### Limitations of a Defensive Portfolio

- Lower Long-Term Returns

By not owning an equity, the portfolio forgoes upside potential. You may only be able to get 5–7% returns the upside but with inflation that might not get you much for retirement.

- Inflation Risk

Over decades, the real value of wealth can erode if inflation surpasses returns. For example, in an inflationary climate of 7%, a portfolio that returns 6% dissipates purchasing power.

- Opportunity Cost

Conservative allocations also mean that investors may take part in the longer-term bull markets, and capture some gains, when stock prices are rising more slowly.

### Investor Suitability

You'll be better off with this type of portfolio if:

- Retirees, or soon-to-be retirees, seeking steady income.
- Conservative investors looking for very low risk.
- Investors seeking near-term objectives and who are unable to afford capital deterioration.
- Individuals with significant financial obligations (such as medical and education costs), who will need to favour liquidity and safety.

### 3.2.3 Balanced Portfolio: Mix of Growth and Stability

An equally-weighted portfolio falls in the middle of aggressive and defensive strategies. It's for investors who desire only growth and capital preservation. Portfolio of these plans generally spread across mostly to equities, and a half in debt instruments (Equity:Debt = 50:50 or 60:40 but this may be difference based on investor need).

This tactic enables investors to take part in rising stock markets, yet offers them the protection of bonds and other fixed-income investments. For instance, in a bull market the equity component makes strong returns; whereas in a bear market, the debt component helps soften the blow.

Some of the key ingredients to a well statespanned portfolio.

- Equities (Growth Component): Includes large-cap and midcap stock or equity funds for appreciation.
- Debt Instruments (Stability Component): This would comprise of bonds, deposits, government securities which give predictable returns.
- Gold/Real Estate: A hedging asset could be added in the portfolio can be gold or real estate.
- Liquid Resources: A modest provision for liquidity.

#### Advantages

- Lowers risk relative to growth portfolios.
- Outperforms defensive portfolios.
- Middle-aged with a modest amount of responsibilities.

## Challenges

To the extent that portfolios are balanced, they will need to be rebalanced in order to keep these proportions. For example, if equities do well and go above the desired allocation level then some of that equity will be sold and redeployed into debt to keep the balance at its target.

This portfolio approach is popular, because it seems prudent and realistic — taking advantage of growth opportunities while hedging against the unforeseen turn to the downside.

### 3.2.4 Thematic Portfolio: Sectoral or Trend-Based Investment

It's based on a specific theme, sector or trend as opposed to general diversification. Rather than spreading investments across all of the industries, it centers its bets in specific areas like technology, renewable energy, health care or emerging markets.

An investor bullish on the future of renewable energy, for example, may assemble a portfolio of solar, wind and electric vehicle companies. In the same way, you could have gone into pharmaceutical and medical equipment companies during a health care boom.

#### Characteristics of Thematic Portfolios

- **Specialization:** Specializes in one or a few industries.
- **High Risk, High Reward:** Returns can be fantastic if the theme works out, but you also can have extreme losses if it doesn't.
- **Time-Sensitive:** Much hinges on timing—getting in when a trend is just beginning and out before that market turns.

#### Benefits

- They offer very high upside if the theme you pick does well.
- Enables investors to match their portfolio with personal preferences or beliefs (e.g., environmentally sustainable, technologically innovative).

### Risks

- Lack of diversification increases vulnerability.
- There will be severe hits to the portfolio from sector sell-offs.
- Calls for a keen understanding and constant review of your topic.

Thematic portfolios are ideal for experienced investors or those who are using a diversified core with a small, high-conviction allocation.

### 3.2.5 Income-Oriented and Growth-Oriented Portfolios

According to whether you seek regular income or long-term growth from it, investment portfolios may also fall into various classes. Income-Oriented Portfolios

These are the portfolios designed to produce stable cash flows with interest, dividends or rental income. They include:

- Government bonds and treasury bills.
- High-dividend blue-chip stocks.
- Real estate where there is rental income.

- Savings deposits and money market funds.

These are the portfolios for retirees, cautious investors, or anyone with liquidity needs who depend on their investments to help pay for living expenses. Stability and predictability are the priority and we have minimum exposure to volatile assets.

### Growth-Oriented Portfolios

Growth Portfolios: Growth portfolios seek a higher total return over time. They include:

- Stocks, especially growth and small-cap stocks.
- Equity mutual funds and exchange-traded funds (ETFs).
- Property with high potential for appreciation.
- Pick alternative assets, such as emerging market funds.

These are portfolios for young investors, or those with long time horizons who value wealth accumulation over immediate income. Big risk exists obviously, though it's big reward as well (minus the steady 10% annual)

### Comparative Insight

Whether to go with an income or growth portfolio will depend on the investor's requirements. Some may even do both – investing some capital in income-generating assets and preserving part for long-term growth. The result is both financial security today but also wealth for tomorrow.”

## Knowledge Check 1

Choose the correct option:

1. Which portfolio type primarily invests in equities with long-term horizons?
  - a) Defensive
  - b) Aggressive
  - c) Income-oriented
  - d) Thematic
2. Which portfolio emphasizes capital preservation and stable returns?
  - a) Growth-oriented
  - b) Balanced
  - c) Defensive
  - d) Aggressive

### 3.3 Risk Pooling and Mitigation through Portfolios

At the heart of contemporary investment management is this idea of risk pooling and moderation via portfolios. There is no return without risk, as there are different types of risks that are present per asset class due to economic cycle, market volatility, inflation rates and interest rate changes and even global events. By forming a portfolio, investors spread their risks among various instruments so that the weakness of one is stopped by the strength of another. Portfolios serve as pooling devices, which allow to reduce outside shocks, smooth returns and match investments with risk averseness in this way.

Risk management is not about removing risk all together, which is impossible, but managing it effectively. Portfolios employ techniques such as diversification, asset allocation, correlation analysis, rebalancing and disciplined investment schedule to achieve a balance. Combined, these strategies keep an investor's financial journey on an even keel in uncertain times.

#### 3.3.1 Concept of Diversification

4 Diversification is the risk's right-hand man in investing. It is the process of distributing investments across various asset classes, sectors, industries and/or geographies to minimize exposure to risk. The concept is simple, but powerful: Not all assets move in the same direction at the same time. By investing into an array of instruments, bad performance from one can be counteracted by good performance from others.

At its most fundamental, diversification shields investors against unsystematic risk (risk inherent to a specific company, industry or sector). For example, if an investor invests all of their money into airline shares and the industry crashes after the cost of fuel increases, entire wealth could be lost. Even a mixed bag of airline stocks, government bonds, property and gold would do better in such an environment.

#### Dimensions of Diversification

- Across Asset Classes: This ensures that different types of assets are able to balance the other (equities, bonds, commodities, real estate and cash equivalents).

Asset Classes: Ownership of stock in different companies across industries limits exposure to any single industry.

- Geographical diversification: Investing in global markets can provide some protection against local economic or political volatility.
- Dollar Cost Averaging: Investing systematically over time minimize the likelihood of making purchases at inopportune times.

We have heard of the proverb, 'Diversification is a good thing', or sometimes expressed in this way; "Don't put all your eggs into one basket." But it's a bit more complicated than that. Real diversification is not simply spreading money around randomly, but investing in assets that offer different risk-return trade-offs.

Although diversifications eliminate most of the unsystematic risk, it does not reduce systematic risk, which is the risk associated with general economic factors and cannot be removed through diversification. However, a diversified portfolio has less of these peaks and troughs and so is less likely to experience catastrophic losses.

### 3.3.2 Correlation Between Assets and Risk Reduction

Correlation measures the degree of how two assets move with respect to each other. Because diversification works not just through the number of assets owned but also by how they correlate to one another, it is very important for reducing risk.

- If two assets are positively correlated, they go in the same direction. For instance, shares in the same industry tend to move up and down together. Having both doesn't cut risk much.
- If two assets are negatively correlated, then one tends to go up when the other goes down. For example, shares and government bonds typically negatively correlate when the economy is at its lowest. Holding both provides strong protection.
- When assets have a low or zero correlation, they march in different directions. For instance, gold prices might not be directly correlated with the stock market movement – these 'loose linkages' aid as a hedge.

By branching out into assets whose correlation is low or negative, investors can construct portfolios that dissipate jumps and drops. For instance, when stock markets fall amid economic slowdown, bonds can rise as investors flock to safe havens. In the same way and being very general, monetary inflation benefits commodities including gold which can help offset losses elsewhere.

Asset allocation is also guided by correlation. If one diversifies only within a single sector (i.e. one of high correlation among securities), e.g. the tech industry, then they will still be risky. But having money spread out among technology stocks, health care bonds, real estate and gold provides significant protection.

So correlation takes diversification to another level and ensures that portfolios are not just holding a lot of assets but building good balance between them in terms of risk.

### 3.3.3 Asset Allocation Strategies

Asset location is the foundation of building a portfolio. It's all about the spread, or allocation if you like. This refers to the mix of investments (enterprise shares, government bonds, commodities, real estate and cash equivalents) in a portfolio relative to an investor's specific objectives, time horizon and tolerance for risk. It's been the subject of financial economics research that asset allocation drives most of the variation (differentiation) in portfolio performance over time, more so than security selection or market timing. In plain English, the amount an investor is holding in equities, debt or alternatives counts for a great deal more than which specific stock or bond they decide on.

The rationale for asset allocation is diversification where each asset class would react differently in different economic environments.

- Stocks do well in times of economic expansion, when companies are reaping strong earnings.
- Bonds generally shine when economies are in recession or interest rates drop.
- Commodities, and gold in particular, have tended to rally during inflationary or crisis periods.
- Real estate generates both rental income and capital appreciation, and it's often seen as a good hedge against inflation.
- There is a safety net available in the form of cash equivalents such as the Treasury bills or liquid funds in a case of emergency.

By allocating investments prudently among these classes, an investor can develop a portfolio that maintains the growth and provides for safety at a reasonable level of total portfolio volatility.

## Major Asset Allocation Strategies

2.4 Long Term Strategic Asset Allocation In the long term (between 5 to 10 years), there is a belief that passive investment, fixed in accordance with the strategic asset allocation, will outperform active management in capturing broad market risks adjusted returns.

This methodology sets target allocations for various asset classes based on the investor's long-term profile and objectives, which do not change significantly during time.

- Example: A 60-30-10 mix for a young, growth-focused investor could allocate that person 60% to equities, or stocks; 30% in bonds and 10% in gold. While the proportions will not change, you may also rebalance periodically in order to get back to these targets.
- Rationale: Markets are crazy over the short term, but they make more sense when seen through decades of perspective; long-term allocations reflect risk capacity and reduce the likelihood that our discipline will fall prey to market folly.
- Suitability: Ideal for investors with a steady financial picture and well-defined long-term goals like retirement planning.

### **Tactical Asset Allocation** (Short-Term Adjustments)

**Tactical asset allocation** involves interim departure from the long-term strategic mix in order to take advantage of short-term investment opportunities in the market.

- Example: If an investor has a base of 60% in equities, they may temporarily go to 70% when the market is running hot and trimming it later when valuations start to look stretched?
- What it is: Aims to add another layer of returns by taking advantage of market cycles.

- Risks: Too frequent use of tactical shifts can become speculative timing, which tanks about as often as predictions go wrong.
- Suitability: For moderately active investors who keep a close eye on the markets.

### Flexible And Continuous Shifting Of Asset Allocation

Tactical asset allocation responds to changing macroeconomic, interest rate or valuation trends by shifting portfolio weights over time. Dynamic allocation isn't like tactical moves, which are temporary and occur opportunistically, it's systematized and it reacts to changes.

- Example: A tactical approach may lower exposure to equities during extended recessions and gradually increase it during recoveries. Dynamic Asset Allocation Funds (Balanced Advantage Funds) in India work on this framework, which changes the equity and debt portfolio without any intervention.
- Why: Allows investors to shift portfolios in response to shifts in macroeconomic conditions without needing regular human input.
- Suitability: Ideal for investors who want flexibility and professional fund management to navigate uncertain markets.

### Core-Satellite Approach (Hybrid Strategy)

The strategy involves an enduring core and a smaller, more aggressive “satellite” allocation for bigger returns.

- Core Portfolio: Usually 70 to 80 percent of total investments, invested in low-cost diversified options such as index funds, government bonds, or blue-chip stocks.

- Satellite Portfolio: The rest 20–30% is placed in high-risk-high return instruments, which include small cap stocks, sectoral funds, international equities or alternative investments.
- Example: 70% in core allocation group of Nifty 50 Index Fund + 20% in Mid/Small-Cap Funds + 10% Global Technology ETF.
- Why: Core for stability, satellite to supercharge returns.
- Suitability: For investors looking to strike a balance between discipline and the freedom to chase the next niche growth phenomenon.

### Importance of Rebalancing

Asset allocation is not a “set-and-forget” task. The weights are allowed to deviate from their targets when the market change. If, for example, equities do well and their portfolio’s 60% equity allocation swells to 75%, they can sell a portion and reduce the allocation.

portfolio riskier than intended. Regular rebalancing (quarterly, annually or goal-based) is the process of returning your portfolio back to its intended design.

- Example: Offselling equity after a bull run and purchasing bond or gold to rebalance discipline reduces the exposure risk getting over hyped.

### Age and Stages of the Investor’s Evolution

Asset allocation changes as you getting older and situation change:

- The Young Investor: High equity percentage (70-90%) for growth.

- Investors in Mid-Life: Balanced between stock (40-60%) and bond (30-50%) funds to handle responsibilities.
- Retirees: sound portfolio mix, emphasis on bonds and incomeproducing assets, with light exposure to stocks (10-20%).

This takes into account the lifecycle which allows portfolios to fit within risk tolerance and investible surplus over it's lifetime.

### 3.3.4 Rebalancing Portfolios to Maintain Risk Profile

Rebalancing is the act of adjusting a portfolio's weightings to their original proportions. At the margin it drifts as different investments have different returns. For instance, if stocks outperform bonds, the stock allotment could increase from 60% to 75%. This heightens the risk profile as compared to what investor is comfortable with.

To fix it, you need to rebalance by selling some of what surged and putting the proceeds into laggards. This rebalances the portfolio to its target allocation, keeping risk in line with the investor's risk tolerance.

#### Importance of Rebalancing

- Risk Management: Avoid making your portfolios accidentally too aggressive or conservative.
- Discipline: Helps investors stay aligned with their goals by selling some of what has run up recently and buying more of what has fallen out of favor.
- Goal Oriented: Helps keep a portfolio in line with life stages and goals.

#### Methods of Rebalancing

- Time-Based: Rebalancing allocations at pre-determined times, like once a year or every six months.

- Rebalancing Strategies Observables
- Constant rebalancing: After a week, month or quarter the initial asset allocation ratio of 1 to e is readjusted and executed by a firm accordingly (possibly stopped due to takeover of the company).
- Calendar-based rebalancing with tolerance based on space: Execute every j holidays (?), but asset allocations are adjusted only when they diverge more than t from the ideal distribution.

- Hybrid Method: It is combination of time based and threshold methods.

Rebalancing must therefore be carefully implemented to minimize transaction costs and tax consequences. But its long-term benefits are more than worth the short-term costs in terms of portfolio integrity and protection from unintended exposure to risk.

### 3.3.5 Systematic Investment Planning (SIP) and Portfolio Strategy

Under SIPs or Systematic Investment Planning, a regular amount of an investment is invested in mutual funds or portfolios at fixed intervals. It is a risk-reducing tactic whereby investments are spread over time, instead of contributed in one sum.

SIPs are in perfect sync with portfolio strategy as they mitigate the volatility effect on investments as a result of rupee-cost averaging. By saving at a consistent pace, investors buy more units when stock prices are low and fewer when they are high, leading to an average cost kind of like smoothing out peaks and valleys.

#### Advantages of SIP in your Portfolio Strategy

- Hedging: Acts as a safeguard against bad timing by spreading the investments.
- Discipline: Promotes disciplined saving and investing behaviors.
- Compounded Benefit: Small, periodic investments add up over time.

- **Accessibility:** It enables low-income investors to accumulate portfolios slowly.

SIPs also assist investors to stay aloof from short-term market volatility emotionally. They don't try to time the market, but rather look for long-term growth. For instance, an investor who invests monthly to equity funds develops exposure to equities without worrying about investing lump sum during volatile times.

Furthermore, SIPs add value to any asset allocation by helping investors systematically distribute their contributions among several funds with varying portfolio compositions. One single SIP scheme can be constructed in such a way that money gets allocated simultaneously to equity, debt and hybrid to give diversification an additional push.

In this context, SIPs are an effective means of practicing portfolio strategies, especially for the small investor who wants to create long-term wealth while managing risk properly.

### 3.4 Objectives and Benefits of Forming a Portfolio

The investment portfolio creation is a critical process for financial planning and wealth management. It is a systematic approach to deploy resources across multiple instruments, in such a way that an investors' dreams are aligned with practical plans. Portfolios are more than the concept of just investing. They're logical constructs that weigh safety, liquidity, growth and psychological comfort. Rather than invest randomly or in one-off situations, portfolios present a systematic way to not only preserve but grow money. Their values cross more than a financial threshold; they have strategic (even emotional) importance that make them necessary for both individuals and organizations.

#### 3.4.1 Financial Goal Alignment

The goal of portfolio construction is to make investments line up directly with a person's financial goals. Investors generally have more than one goal in mind at the same time — some short-term and others that span years, perhaps decade. These can include short-term goals like holiday or car plans, medium terms ones such as funding your child's education or buying a house and long term like retirement corpus or leaving behind an inheritance.

A tightly woven portfolio connects objectives and tactics. Rather than investing across investments haphazardly, alignment ensures each rupee is deployed in an instrument that reflects the tenor/ risk profile of the goal.

### Short-Term Goals (1–3 years)

For goals in the near-term, the focus is on safety and liquidity because that money will be needed sooner rather than later and can't afford market volatility.

- Example Goals: Saving for a vacation, establishing an emergency fund or making a down payment on a car.

- Portfolio Example:

- o 50% in Treasury bills or T-bills, or other short-term securities issued by the government.

- o 30% best fd or rd with AA+88 rated bonds ( $\sigma > 90$ )

- o 20% in liquid mutual funds or savings account

They offer easy access and strong rates, so the money is there when it's needed. You don't want to invest in stocks for that sort of need; a market crash could lose you the money right at life's most expensive period.

### Medium-Term Goals (3–10 years)

Sleeping well for goals that are in the medium term: Portfolios can take moderate risk to gain higher returns while ensuring stability.



- Example Goals : Children education costs, Buy a house, Corpus for expansion of business etc.

- Portfolio Example:

- o 40% large-cap equity funds for growth which is steady

- o 30% debt mutual funds or high rated corporate bonds for safety

- o 20% hybrid or balanced funds for a balance between risk and return

- o 10% in gold (through ETFs or sovereign gold bonds) for inflation risk protection.

This balanced blend also prevents the portfolio from growing too quickly in a hyper-inflation environment, yet doesn't suffer from the large swings of an equity-only portfolio.

### Long-Term Goals (10+ years)

Long-term goals also call for optimism that hardly wanes during the decades, which makes for a portfolio heavy on growth and compounding and light with regard to volatility in any given short period of time.

- Example Goals: Planning to retire, transferring wealth to children, or building a sizable investment portfolio.

- Portfolio Example:

- o 60% diversified equities (large, mid and small-cap funds) for growth

- o 20% international equity or global ETFs - for geographic diversification
  
- o 10% REITs or direct real estate for long-term appreciation and income
  
- o 10% commodities or gold [ to protect against inflation and systemic risk]

Because of the compounding effect of stocks and real assets these portfolios gradually accumulate a significant level of wealth. Crucially, short-term volatility becomes less of a menace when the consideration is decades of growth.

### Importance of Alignment

When you connect portfolios to learning objectives, a number of benefits result:

- No Mismatches: Retirement savings are not invested in volatile assets just prior to retirement, and long-term wealth is not wasted in low yield savings accounts.
  
- Intentional Allocation: Each investment you make serves a specific purpose — liquidity for short-term needs, stability for medium-term goals and growth for long term aspirations.
  
- Monitoring Progress: Periodic tract review can allow investors to change strategies in response to changed market conditions or to one's personal circumstances. For instance, equity exposure is decreased with retirement nearing while debt proportion increases.

### 3.4.2 Enhanced Return Potential with Managed Risk

Another critical goal for portfolio construction is to increase return potential without taking on irresponsible risks. Of course, investments are uncertain by their nature, and so the issue is to get growth but protect yourself. Portfolios do this by including a mix of investments that have varying risk-return profiles.

High-growth assets like stocks are necessary for growing wealth over time but they're also volatile in the short term. On the other hand, low-risk instruments such as government bonds, fixed deposits and treasury bills are stable/have limited returns. A portfolio blends these two to where growth is not sacrificed for safety, and safety is not forsaken for growth. This balance is why portfolios perform better than single-asset strategies.

This strategy is rooted in the principle of risk-return trade-off. Even investors, who are willing to accept higher returns in exchange for taking more risk, know that a portfolio is designed to spread this risk so that the downside can be softened. For example, when stock markets

drop during economic downturns, the bond portion of a portfolio typically does well, providing some stability to returns. Conversely, with inflation higher, such groups as commodities or equities could produce positive results that counterbalance the weaker performance in safe instruments.

The ability to control for risk yet still aim for high return, makes portfolios work in all economies. More aggressive investors can lean all the way into equities and still have a safety net in bonds, while more-conservative types might want to do just the opposite. Whatever the combination in which they are held, the structure of the portfolio ensures that risk is managed in a systematic fashion, freeing investors to pursue ambitious objectives with confidence.

### 3.4.3 Liquidity Management Across Instruments

The ability to maintain and control liquidity is an important advantage of the portfolios in that it permits access to cash when needed without disrupting the investment plan. Liquidity represents how easily an investment can be sold for cash with minimal loss. – A portfolio, simply by definition, will include instruments of differing liquidity to balance current needs with future growth.

One part of this portfolio consists of very liquid assets, for example saving accounts, money market funds or short-term deposits. These are also for convenience, you have quick money available in case of any form of emergency like for medical or house expenses, unexpected obligations. Semi-liquid investments — bonds or certain mutual funds, say — can be tapped in a matter of days and are best for medium-term needs like education or a home renovation.

Long term assets such as real estate, retirement funds and long term deposits are not that liquid but hold their value over time.

What's good about liquidity management is that it preserves long-term strategies from being thrown off course. For example, should they have a large and unexpected financial obligation at some point, they don't need to liquidate their equity or real estate investments intended for long-term needs — because those assets pay over to them in cash on demand. The liquidity also gives a sense of security, since investors are aware that they have reserves for any kind of emergency. This organisation of funds over instruments of varying degrees of liquidity is meant to protect portfolios from short-term imperatives at the expense of long-term aims.

#### 3.4.4 Psychological Comfort and Control Over Finances

Not only does a portfolio serve as a financial instrument, but it also provides some psychological comfort and control. Financial stress is one of those things that can be very difficult to overcome, and it is often born out of concern about the uncertain, volatile nature of markets as well as losing money in general. That's where a well-designed portfolio comes in, providing stability, clarity and discipline.

The psychological security comes from understanding that risk is diversified. One asset lags, and another often makes up the difference to blunt the impact. For instance, if it's stocks that suffer a steep price decline, then bonds or gold may soar, helping to keep the entire portfolio afloat. This helps eliminate panic and keeps investors focused on long term goals instead of responding emotionally to short term ups-and-down.

Portfolios also provide clarity. When investments are tied directly to goals, investors know exactly why they own it, helping establish greater control. This transparency does away with the chaos of piecemeal, uncoordinated investments. Furthermore, portfolios encourage disciplined habits. Everything else you do, such as regularly contributing to your savings pool, periodically reviewing your progress toward meeting financial goals, and rebalancing (if you're invested in the market or have a 401(k) account elsewhere), is good financial hygiene.

Psychological Comfort Below-the-skin comfort isn't the only psychological dynamic at work. Structured portfolios are more likely to lead investors to feel that they can answer their commitments and secure their future. And they are less prone to making impulsive decisions based on greed in the booms or fear in the busts. Portfolios then become structures that protect not just financial capital but emotional health.

### 3.4.5 Long-Term Wealth Generation

Building lasting wealth is the most timeless and universal goal of portfolio design. Though, narrow term liquidity and medium-term obligations being important goals for most investors but objectively at higher level all are seeking to build a corpus which gives financial freedom, intergenerational security and resilience to risks in form of savings elements. Creating wealth for the long term not only helps fulfill retirement needs, but also pays for your children's education, invests in assets and can even build a legacy beyond your lifetime.

Compounding is the magic behind creating long-term wealth. As those returns compound over many decades, growth accelerates because earnings themselves start earning more. This compound effect is only made possible through time, discipline and regular contributions. Just small, regular deposits that will grow into considerable sums when made over 20–30 years.

#### The Role of Compounding

- Example: An investor investing ₹10,000 a month in a portfolio earning an average of 12% per annum will have a corpus that is higher than ₹1.3 crore at the end of the 25 years. Had there been no reinvestment (simple interest), the total would have been around ₹30 lakh only. This huge contrast highlights the power of compounding and how your wealth can grow exponentially.
- Key Insight: It's time in the market that matters, not timing the market. Those who stick with investments through cycles are far better off than those who try to time the market.

#### Portfolio Design for Long-Term Wealth

Wealth is a product, not of individual asset class performance, but from a disciplined exposure to growth-orientated (or stability providing) assets.

- Equities (Domestic and International):

Equity is the long term wealth creator because it delivers high returns historically (10-15% annually in India). Investments in large-cap, mid-cap and small cap stocks or equity mutual funds will provide diversification.

For instance, someone who is 30 can invest 70% in equities through domestic index funds and mid-cap funds as also global ETFs.

- Real Estate / REITs:

Real estate offers appreciation and rental income on the property. By way of real estate investment trusts (REITs) it becomes possible for even small investors to participate, without massive capital outlays.

Example: A long-term investor can allocate 15% to real estate/REITs for inflation protection and diversification beyond equities.

- Debt Instruments:

Debt brings stability and cushions the bumps of equities. Debt-like returns are modest, but they provide liquidity and limits the risk of forced withdrawals during downturns.

Example: Holding 10–15% in high-quality government or corporate bonds acts as a shield against deep drawdowns.

- Gold / Commodities:

Gold is a crisis hedge and an inflation defender. It doesn't make money, but its worth increases at times of upheaval in the markets.

Sample: Gold ETFs and sovereign gold bonds (5–10% for balance against equity market crashes).

Sample Long-Term Wealth Portfolio (Investor Age 30, Planning to Retire at 60)

- Equities: 70%
- o 40% Indian large cap index funds (such as Nifty 50)
- o 20% mid- and small-cap funds for greater potential of growth

You hold the following: o 10% in global equity ETFs (eg Nasdaq 100, SP500)

- Debt Instruments: 15%
- o Sovereigns, AAA corporate bonds and debt mutual funds.
- Real Estate/REITs: 10%
- o Mutual funds that invest in real estate or real estate for income and inflation protection
- Gold: 5%
- o Gold ETFs or sovereign gold bonds.

With an annual investment of ₹1,20,000 over 30 years such a portfolio can easily grow to ₹3–5 crore accumulating an average return of 10–12%.

Benefits of Long-Term Wealth Generation

- Financial Independence – Less dependency on earned income or outside support in the future.
- Inflation Hedge: Stocks, and real estate do not lose buying power over decades.
- Legacy & security: Provides for a wealth transfer or children’s education, or fulfills philanthropic objectives.
- Shocks resilience: A diversified portfolio over the long term can withstand market downturns, absorbing any temporary losses and recover when trends change.

### “Activity: Designing Your Ideal Portfolio Mix”

Assume you are given ₹10 lakhs to invest, with three goals: purchasing a car in three years, securing children’s higher education in 12 years, and ensuring retirement wealth in 30 years. Based on the portfolio types discussed—Aggressive, Defensive, Balanced, Thematic, and Income/Growth-

Oriented—design a portfolio allocation that matches these goals. Describe which portfolio type you would emphasize and justify your reasoning by linking your allocation to risk tolerance, liquidity needs, and the time horizon of each goal. Reflect on how your chosen portfolio would perform during both market booms and downturns.

## 3.5 Summary

☐ Portfolio Formation: Portfolio formation is the rule based process of selecting a group of assets to strike balance between risk, return and liquidity.

☐ Investment portfolios are important in mapping financial targets with the right strategy for short, medium and long term goals.

☐ Diversification is the primary means of reducing risk by spreading exposure among a collection of asset classes, sectors and geographies.

☐ There is a correlation on those assets that the way of diversification works, where assets have negative or low-correlation decay volatility.

☐ Asset allocation is the most important decision in portfolio construction; it drives risk-return results more significantly than security selection.

☐ And by rebalancing, portfolio are brought back in line with their desired risk character and investor goals.

☐ Systematic Investment Planning (SIP) enhances portfolio tactics by spreading investments over time and minimising the risk of timing.

☐ Portfolios are designed to help clients achieve a range of investment goals, such as the preservation and growth of capital, managing liquidity and tax efficiency.

☐ Portfolio Types like Aggressive, defensive, balanced, thematic and Income/Growth oriented cater to wide range of Investor needs.

2 Portfolios also offer “psy- chological comfort” due Read more 3 Cut down uncertainty, in other words kick the habit 4 You even bring financial discipline, if too late then people must retire after a panic-set fire It makes some to cease and retire Like others who didn't realize they were on fire.

☐ Creating wealth in the long term is through compounding and allocating to growth-oriented assets with discipline.

☐ Case studies show that adopting a portfolio approach works better than investing in single investments to achieve multifaceted financial objectives.

### 3.6 Key Terms

**Portfolio Composition:** Building a collection of resources (like investments) to manage risks and returns.

**Diversification:** The practice of investing in asset classes to minimise exposure to certain risks.

**Asset Allocation:** Investing in different asset classes to reach desired goals.

**Correlation:** A statistical way of measuring the relationship between two assets' movements compared to each other.

**Rebalancing:** Realigning portfolio allocations in order to retain the desired risk-return equilibrium.

**Systematic Investment Plan (SIP):** Periodic fixed-amount investment in funds or portfolios.

**Aggressive Portfolio:** A portfolio with high-risk high on return and equity oriented.

**Conservative Portfolio:** A low-risk portfolio focusing on the preservation of capital.

**Balanced Portfolio:** A combination of growth and stability, with equities and debt.

Thematic Portfolio: An investment targeted toward certain sectors, themes, or trends.

Liquidity: How easily an asset can be turned into cash without significant loss in value.

Compounding: The magical effect of earning returns on your reinvested returns that turbocharges the growth of wealth.

### 3.7 Descriptive Questions

Discuss the idea of diversification and its use in diminishing portfolio risk.

Examine the effect of asset correlation on portfolio construction.

Explain the significance of asset allocation methods in portfolio development.

What is the purpose of creating a portfolio, and what are its advantages to investors?

The aggressive, defensive and balanced portfolios can be compared.

How does managing for liquidity provide financial flexibility in a portfolio?

Examine the mental dividends of owning a sound investment portfolio.

Describe how SIP helps in reducing the risk of a portfolio.

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### Knowledge Check 1

1. b) Aggressive
2. c) Defensive
3. b) Balanced
4. a) Thematic
5. c) Income-oriented

### 3.9 Case Study

## Background

Rohit Sharma, 35, marketing professional How: ₹25 lakhs over 10 years material aspirations vary: buy a house in 5 years, pay for his children's

college within 15 years, and accumulated retirement savings at age 60. Rohit's investments are quite skewed towards fixed deposits, which though safe offer very little growth. Worried about inflation and not having enough money, he meets with a financial adviser to discuss investment strategies.

The advisor clarifies that though in fixed deposits and capital is preserved, it may not be enough for Rohit's long term goals. Instead, he said, he should build a portfolio that reflects growth, liquidity and safety for different periods of time. The adviser gives choices for aggressive, defensive and balanced portfolios as well as thematic or income/growth-based strategies.

## Portfolio Proposal

Rohit's financial planner advises him to classify his wealth into three categories:

**Short Term (House in 5 Years):** Allocating about 35% to Debt Instruments, such as Bonds, Treasury Bills and Fixed Deposits. These create liquidity and conserve capital.

**Medium-Term (Children's Education in 15 years):** Invest 30% in balanced funds that invest both in equities and debt. Stocks give you the juice, debt cuts volatility.

**Longer-Term (Retirement in 25 Years):** Invest 35% in aggressive vehicles such as

stocks, equity mutual funds and maybe a small commitment to real estate or themed sectors such as renewable energy.

The advisor also suggests a SIP (Systematic Investment Plan) to invest the monthly savings in equity funds, thereby maintaining a steady investment in growth assets. Rebalancing biannually is recommended to keep risk on track.

### Problem Statements and Solutions

**Problem 1:** How can Rohit safeguard his capital for the short-term requirement of buying a house?

**Solution:** Rohit secures his principle by investing 35% of his money in fixed deposits, bonds and treasury bills. These are predictable investments, meaning his house fund will be there — and without market risk.

**Problem 2:** What should Rohit do to balance growth with stability when it comes to his children's education?

**Solution:** Invest 30% of the portfolio in balanced funds at a combination of stocks and bonds to achieve capital appreciation over the next 15 years, while mitigating volatility. Rebalancing this portion periodically makes certain that it remains roughly in line with

the medium-term objective.

**Issue 3:** How do I find a way to get the most retirement income without excessive risk?

**Solution:** Rohit trims down the exposure to aggressive equity and growth funds to 35%. SIPs in diversified

open-end equity funds provide steady flows of cash. Compounding amplifies returns over 25 years. This rebalancing trims equity exposure as retirement draws nearer, while also protecting the nest egg from market moves.

### Reflective Questions

How does diversification help Rohit get stability in more than one goal?

Why does rebalancing matter in Rohit's long-term retirement strategy?

Question How does SIP help put Sh orien Rohit in mitigating the market timing risks?

What part does liquidity management has in helping Rohit meet requirement of his short term without disturbing long term assets?

Would a thematic portfolio in renewable energy or technology be suitable for Rohit's retirement plan? Why or why not?

### Conclusion

Rohit's story exemplifies that building a portfolio is very much needed to plan for multiple goals.

simultaneously. He gets both safety and growth by marrying time horizons to asset allocation. In addition to diversification and correlation management, the portfolio.

is capable of achieving financial flexibility through liquidity and SIPs. Through disciplined planning and rebalancing,

Rohit gets the best of both worlds as he takes care of short-term needs and in the long-run.  
This case

focuses on how portfolio-based investing is a sound, sturdy method of investment that is objective-driven compared to single-instrument methods.

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## Unit 4 Portfolio Designing and Management

### Learning Objectives

1. Understand the fundamental concepts and principles of portfolio designing and management.
2. Analyze the relationship between risk, return, and diversification in portfolio construction.
3. Apply various portfolio management strategies to optimize investment performance.
4. Evaluate different asset classes and their role in building a balanced portfolio.
5. Develop skills to design, implement, and monitor an investment portfolio.
6. Use quantitative tools and techniques for portfolio analysis and decision-making.
7. Assess the impact of market trends and economic factors on portfolio performance.
8. Demonstrate the ability to align portfolio design with investors' financial goals and risk tolerance.

### Content

- 4.0 Introductory Caselet
- 4.1 Steps in Constructing an Investment Portfolio
- 4.2 Active vs **Passive Portfolio Management**
- 4.3** Responsibilities of **Portfolio** Managers
- 4.4** Fiduciary Duties in Portfolio Management
- 4.5 Summary
- 4.6 Key Terms
- 4.7 Descriptive Questions
- 4.8 References
- 4.9 Case Study



#### 4.0 Introductory Caselet

Rohit (32 Years) IT Professional Rohit, a 32 year old individual who had recently received an extraordinary annual bonus and savings of ₹10 lakhs. His intention is for this money to be invested as it is meant to ensure a financially stable future and fulfill long term dreams such as buying a house, child's education and early retirement.

Rohit has very limited financial understanding of such investment instruments and he doesn't know how to reconcile risk with returns. A friend recommended that he dumping money heavily into equity mutual funds to get higher returns, while his parents told him to stick with fixed deposits and government bonds for safety.

Rohit decided to take financial advice before taking a call. The advice to this investor was that the latter should form a diversified portfolio comprising equity mutual funds, government securities and corporate bonds while at least part of his corpus should be in liquid funds to meet any contingency. Rohit is now tasked in matching his risk appetite, financial objectives and market conditions to create an appropriate portfolio.

#### Critical Thinking Question:

As Rohit's financial planner, how would you structure their portfolio to account for risk and return, and achieve his short-term and long-term financial objectives?

#### 4.1 Steps in Constructing an Investment Portfolio

Investment planning is as much a part of a well run trading program as mitigation of risk associated with investment decision making. The point isn't simply to grab a bunch of random investments, but to seek out and deliberately construct them in a way that fits with the investor's goals, risk tolerance and financial resources. This will be organized around a logical series of steps—establishing investment goals and time horizon, evaluating risk tolerance and financial situation, developing an asset allocation plan, choosing investments

or instruments, maintaining the portfolio through regular reviews and potentially rebalancing. All these steps are interrelated and a step towards creating a portfolio that is effective, sustainable as well as can give lasting financial success.

#### 4.1.1 Defining Investment Objectives and Time Horizon

The first step to constructing any portfolio is defining what the investor would like achieve. Objectives provide a base: they are what ensures that everything you do is motivated by considerations about the goals and not whatever instinct. Typically the investors have various goals like wealth creation and protection of the capital, by clearly stating these objectives, no mismatch can be found between different kinds of investments chosen and their actual requirement.

Investment goals can be divided into four general categories:

- **Capital Protection:** Investors who are more concerned about safety include those who want to preserve their wealth than merely making it grow, and these investors opt for safe investments like govt. bonds or fixed deposits. ”

It is even more critical for retirees or other conservative investors, who cannot afford to lose any money.

- **Growth versus income:** Some investors want periodic cash flow from dividends, interest or rental income.

This is a common goal for people in middle age or retired, who wish to add extra funds.

- **Capital Appreciation:** Younger investors tend to focus on growing their money over time, being willing to “stand the heat” of short-term fluctuations in return for higher long-term returns through equities or real estate.

This is about wealth creation not instant cash.

- Tax Efficient: Some investors invest wisely to reduce tax liability through tax-saving bonds, retirement plans or government schemes.

This goal eases the financial load, yet returns can still appreciate.

In addition to goals, the time frame (length of time that investments will be held) is just as critical. or high-yield, and a long-term horizon (10+ years) could benefit from exposure to equity-risk. Period 0-3 Yrs : A short term extension of the company requires acquisition of safest risk free liquid investments.

“age in bonds” and seek moderate growth, then a longer-term time horizon (10+ years) are better suited for riskier, growth-oriented investments.

Other things to keep in mind include liquidity requirements (for when you will want to access funds), the impact of inflation (rising costs that eat into real returns) and life events, such as marriage, kids or retirement, which might change your goals. The use of transparent objectives with an achievable time frame helps provide a solid building block for a portfolio that is meaningful and sustainable.

#### 4.1.2 Assessing Risk Appetite and Financial Profile

After the investment goals have been defined, next is to determine an investor's risk tolerance. This in turns involves assessment of their risk-taking propensity (risk appetite) and their risk-bearing capacity (financial profile). Where as risk appetite indicates the psychological comfort with volatility and prospects of loss, financial profile is the ability to take on risks based on income, savings, assets, liabilities and long term commitments.

Portfolios go down the drain when this combination is out of whack. For example, an investor may think they can handle aggressive allocations, but if a decline eliminates 30% of their portfolio and they panic-sell, the strategy is not going to work. Conversely, a person who has relatively high income and assets may do too little investing in growth-dominant investments as he or she is overly conservative, leaving long-term wealth on the table.

The determinants of risk-taking and financial capability

- Age and Time Horizon

The appetite for risk is also strongly determined by age. Younger investors have more time to recover from the markets, and can afford market dips, while older pre-retiree investors need to protect their capital.

- o Example:

☐ A 25-year-old engineer who is thinking about retirement 35 years from now might have a portfolio of equities (70%), debt (20%) and gold (10%).

☐ But a 60-year old retiree might flip that into 70% in bonds, 20% in stocks and 10 % in gold, concentrated on income and safety.

- Income and Net Worth

Higher and more secure incomes increase risk-taking capacity, because surplus income will provide a cushion against adverse outcomes. Low or unstable income decreases tolerance, because losses could affect survival and be potentially lethal.

- o Example:

An executive with high income has a 60% equity/25% debt/10% real estate/5% alternatives allocation knowing they are secure on lifestyle spending.

☐ If a teacher working in an average-earning school has 50% of his portfolio invested in debt, 30% in equities, and 20% in gold.

to balance growth with safety.

- Knowledge and Experience

Investors who are familiar with the market and have high financial literacy tend to manage volatility more effectively. They don't resort to panic selling or attempting dumb moves. New investors tend to over/underestimate risks which would influence them emotionally.

o Example: A professional investor may stay invested in shares when a market collapses, but an inexperienced investor might sell out too early and realise losses  
o Risk Warning: We think it is worthwhile to remind you that the value of investments can go down as well as up.

- Life Stage and Dependents

Financial obligations — whether children's education, home loans or dependent parents — limit one's ability to take risks. Investors with less responsibilities can take on more exposure to growth assets.

o Example:

an under-35 with the only bascludes taking up to 80% exposure to equities.

☒ A parent paying for the education of two children might cap participation in equities at the 40–50% level, and hold more fixed income to buy safety.

## Tools for Assessing Risk

### Risk Profiling Questionnaires

These present investors with hypothetical situations (i.e. "Would you be ok if your portfolio lost 20% once over a year?"). to measure psychological acceptance of losses.

## Scenario Analysis

They describe how a portfolio would perform in different states of the world (recessions, bull markets, ramps in inflation) and help investors visualize possible results.

## Financial Ratios

These type of ratios like level of debt-to-income, amount set aside-to-expense and adequacy of basis for emergency funds help to quantify the real ability to take risk.

o Example: investor has a DTI > 40%, their stated appetite is irrelevant – stay away from Aggressive portfolios.

## Common Behavioral Challenges

True tolerance is misunderstood by many investors:

- Overconfidence Bias: Feeling that they're equipped to ride out risks, but then panicking when losses set in.
- Fear and Herd: Chasing the market, bailing in a downturn and getting back in late.
- Changing Risk Preference: Investors' risk tolerance is dynamic and varies over time. It changes with age, career shifts, family obligations or financial shocks.

This makes continuous reassessment essential. A portfolio appropriate for a professional in their 30s is not the right one at age 50.

## Portfolio Examples by Risk Profile

- Very Aggressive Investor (High Risk Appetite + Strong Financial Position)

- o 70% equities (domestic + international)

- o 15% debt

- o 10% real estate/REITs

- o 5% gold

- Moderate Investor (Average Appetite + Moderate Financial Profile)

- o 50% equities

- o 35% debt

- o 10% gold

- o 5% alternatives

- Conservative Investor (Low risk appetite + Low financial profile)

- o 65% debt (government securities, deposits)

- o 20% equities (blue-chip dividend stocks)

- o 10% gold

o 5% liquidity (in savings, money market funds)

#### 4.1.3 Asset Allocation Strategy Selection

After the investor's objectives and risk limits are determined, the second crucial decision is how much money to allocate to various categories of assets (known as asset classes). Studies from finance (e.g., Brinson, Hood & Beebower studies) have shown that it is this asset allocation decision which has the most effect on a portfolio's long-term performance – far more than either individual security selecting or market timing. In other words, how much of the portfolio is in stocks, bonds, real estate or gold matters much more than which stock, bond or home is purchased.



The basic principle of asset allocation is that each asset class reacts differently to different economic conditions:

- Stocks tend to do best during economic growth and expansion.
- Bonds do relatively better in recessions or when interest rates are falling.

- Commodities and gold do well during inflationary or crisis times.
- Cash and cash equivalents keep the lights on in emergencies.
- Real Estate/REITS Real estate can provide both income and long-term appreciation, while sometimes serving as an inflation hedge.

Combining low or negatively correlated assets can lower portfolio volatility and provide smoother returns overall.

### Approaches to Asset Allocation

BUOYANT Fundamental: Long-Term Buoyant TAA).LONG BUOYANT SCENARIO MODEL (FAVORS LT ASSETS LTA = Long-Term Assets as your investment horizon for both mutual funds & individual securities, if not stated otherwise)

5 This approach establishes desired allocations for each asset class, depending on an investor's risk profile, financial objectives and investment time frame. These proportions are held steady or occasionally rebalanced to restore the style weights in case of drift introduced by market movements.

- Example: A moderate investor may have to keep 60% in stocks, 30% in bonds and 10% in gold for decades. If stocks roar and end up representing 70% of the portfolio, then stocks are sold and the proceeds invested in bonds or gold.
- Use Case: Ideal for disciplined investors who prefer a systematic, goal-oriented approach and don't feel the need to occasionally tinker.

### Tactical Asset Allocation (Opportunistic Adjustments)

Such a strategy permits temporary deviations from the underlying allocation to capitalize on current market conditions.

- Example: During a correction stocks may look like they are undervalued in which case an investor might increase equity allocation from 60% to 70%, and later reduce it back when market stabilization occurs. Conversely, during times of hyperinflation we may have higher exposure to commodity.
- Use Case: Investors with an active eye on the markets and the know-how or assistance to make informed tweaks.

Dynamic in-house asset allocation (free switch being according to business situation)

The first is known as dynamic allocation, or altering the weights of asset categories based on changes in the economy and financial markets -- like interest rates, inflation or recessionary threats.

- Example: In a recession, a dynamic portfolio may reduce an equity allocation from 70 percent to just 40 percent and instead add exposure to bonds and gold. But after the recovery commenced, shares are slowly ramped up once more.
- Indian Context: Several "Balanced Advantage Funds" operate in this fashion, that is they will re-allocate between equity and debt for you.
- Use Case: Appropriate for investors who want flexibility, and are more comfortable with active management to navigate uncertain macroeconomic regimes.

Core-Satellite Approach (Hybrid Strategy)

This combines stability and growth, by building out a strong, stable "core" of your portfolio and leaving just a smaller "satellite" holding for higher-risk opportunities.

- Core: Typically 70, to 80 percent of the portfolio, invested in diversified, low-cost instruments such as index funds, government securities or blue-chip stocks.
- Satellite: 20-30% devoted to high-risk/high-reward investments in small-caps, sector funds or global ETFs.
- For example: 70 percent Nifty 50 Index Fund + 20 percent mid/small-cap equity fund +10 percent global technology ETF.
- Use Case: Investors who are looking for a disciplined core but also want flexibility to pursue higher returns in niche areas.

#### Factors Influencing Asset Allocation

**Appetite for Risk:** Aggressive investors have a bias toward both equities and alternatives; conservative investors prefer bonds and cash.

**Time Horizon:** Long-term objectives will have a greater allocation to equities -- not so for short-term objectives, where liquidity and stability are paramount.

**Economic Backdrop:** Inflation, interest rates and business cycles are the reasons that make a particular asset class perform better in a different point of time.

**Liquidity Requirement:** Investors who have higher liquidity needs (ex. retirees) keep a larger portion of their portfolio in liquid securities.

**Life Stage:** Young investors prioritize growth while middle-aged ones juggle obligations and retirees favor preservation.

#### Portfolio Examples Based on Strategy

- Aggressive Investor (Age 30, High Risk Tolerance, Long Time Horizon):

- o 70% equities (domestic + international)

- o 15% debt

- o 10% real estate/REITs

- o 5% gold

- Moderate Investor (Age 40, Medium-Term Horizon):

- o 50% equities

- o 35% bonds

- o 10% gold

- o 5% liquidity

- Conservative Investor (Age 60, Retired):

- o 65% bonds and fixed deposits

- o 20% equities (blue-chip, dividend-paying)

- o 10% gold

- o 5% cash equivalents

## Diversification Benefits

What asset allocation does is increase diversification in several dimensions:

- Across asset classes: Volatility is mitigated by blending stocks, bonds, commodities and real estate.
- Geographic Diversification: Foreign equities or ETFs add an element of risk beyond the domestic economy.
- Alternative Assets: Commodities, gold or REITs are the hedge against inflation and crisis.

Investors insure their baskets against catastrophic risks by making sure that not all their eggs will hatch in the same direction.

### Did You Know?

"That research by Brinson, Hood, and Beebower in 1986 found that more than 90% of portfolio returns are explained by asset allocation decisions rather than individual security selection?"

#### 4.1.4 Selection of Securities or Instruments

After deciding how much to allocate, investors need to consider which securities in a given asset class to purchase. This is where the rubber meets the road. This is where all of our

theoretical methods turn into real investments. Selection is based on return potential, risk, liquidity, and costs.

The key criteria include:

**Potential Return:** Projecting potential profit based on historical performance or future earning capacity/growth of the underlying security, as well as general macroeconomic variables.

For instance, stocks offer high growth but higher volatility than bonds.

**Risk Profile:** Assessing market risk, default to volatility.

Government bonds are low risk, whereas corporate bonds can bring some credit risks but offer higher returns.

**Liquidity:** The ability to sell investments quickly when it's time to raise the cash.

Highly liquid securities like shares of blue-chip companies can be quickly bought and sold; real estate, not so much.

**Costs:** Including transaction and fund management fees as well as tax effects. High fees can take out a big chunk of overall returns over time.

Selection tools include analysis of financial statements, price patterns (technical) and credit ratings for bonds. Comparative analysis can also be facilitated by quantitative models, such as risk-adjusted return ratios.

Examples of such securities include stocks for growth, bonds for safety, mutual fund or ETFs for diversification, derivatives for protection and alternate assets like gold or real estate for counterbalance. Active strategies are those that trade frequently in order to beat the market,

and passive strategies involve tracking indices with few interventions. This is in line with the objective of market timing (to buy and sell at the right moments) but long term holding tends to be a smoother ride.

Behavioral biases can play a role here, too — investors might chase what's hot or hang on to their losses because of overconfidence or fear of missing out. Andriese869 You want to make sure with the above approach that securities meaningfully add to the overall allocation, so it is a disciplined selection.

#### 4.1.5 Monitoring, Reviewing, and Rebalancing the Portfolio

And the last step is designed to remind that portfolio construction isn't something final, there's always portfolio consolidation;-) Investments need to be constantly monitored, evaluated and realigned with objectives and risks.

The process involves three activities:

- **Watching:** Keeping an eye on how each security and asset class is meeting expectations.

This is a way to identify underperformers or anomalies in the returns.

- **Reviewing:** Whether the portfolio continues to be appropriate in light of the investor's goals and circumstances. For instance, an investor in the midst of their career might go from being aggressive to having a balanced allocation as they approach retirement.

- **Rebalancing:** Returning the mix of investments to their original allocation after market movements cause the proportions to shift.

For example, if stocks get giddy and top their targeted share, some may get sold to load up on bonds.

Rebalancing may be performed by using a calendar (once or twice a year), with a threshold (rebalance when the allocation is off by X%) or in some hybrid form.

Among the obstacles are transaction costs, tax consequences and psychological aversion to selling winning investments. Nevertheless, systemic rebalancing is required to manage risk and maintain goal alignment. Comparison of the return from a portfolio should also be done using performance benchmarks and risk adjusted returns to ensure that outperforming is not come from simply with higher return (higher return for high risk), but it is about achieving a better or more optimal performance taking same risk as those other portfolios.

Through monitoring, reviewing and rebalancing the portfolio has inherent dynamism and adaptiveness as it will change with market movements as well as changes in an investor's life stage.

## 4.2 Active vs Passive Portfolio Management

Portfolio management is the process of determining how assets are chosen, monitored and accounted for over time. By and large, investors generally follow one of two purviews when it comes strategy: active or passive management. Active management seeks to outperform the market through security selection and trading time, while passive management attempts to match the performance of an index with as little interference as possible. Both methods have their strengths and difficulties, and areas in which one or the other is most appropriate.

### 4.2.1 Meaning and Approach of Active Portfolio Management

**Active portfolio management** (also called active investing) refers to a strategy of portfolio management that frequently and deliberately adjusts the weights, holding ratio or number of securities in this portfolio with an aim of outperforming its benchmark or targeting particular superior returns. While passive management assumes that markets are efficient and mirrors them through index funds, the theory behind active management is that markets are not always perfectly efficient. Over time, judicious management can take advantage of these inefficiencies and generate alpha — the excess return above what a passive portfolio would generate.

The approach needs to involve ongoing surveillance of markets, sectors and companies in order to spot opportunities, contain risks and answer the events that suddenly command our attention. Fund managers use a combination of techniques:

- Analysis of the Company (concerning financials, earnings, industry outlook and management).
- Technical analysis (stock price patterns, momentum, moving averages and trading volumes).
- Macroeconomic Research (e.g. of GDP growth, Inflation, interest rates and policy changes).

### Key Elements of Active Portfolio Management

### Key Elements of Active Portfolio Management



**Fig.4.2. Key Elements of Active Portfolio Management**

- 1. Stock Selection

Managers select specific securities they believe will outperform their peers or the overall market.

o Example: Last year, Indian active fund managers that were more overweight HDFC Bank and Reliance Industries (before their respective strong earnings growth phases) will have outperformed the Nifty 50 index.

A US-focused portfolio manager who positioned himself early in Tesla also gained from exponential gains.

- 2. Market Timing

Active managers try to time when they should be in or out of stocks, purchasing undervalued ones or selling when others seem overvalued.

o Example: During the market crash in March of 2020 with COVID-19, Active managers who increased equity exposure before the bounce performed better than passive index funds.

- 3. Sector Rotation

Capital reallocates across industries by managers who respond to macroeconomic boom-bust conditions.

o Example:

☐ If interest rates are going up, you could focus on financials as a play.

☐ Stresses on slowdowns will be more towards consumer staples (FMCG, healthcare EBIDTA) as they are relatively defensive.

☐ In 2021 a number of active managers rotated into IT and pharma in India, sectors that benefited from pandemic-driven digital adoption and healthcare demand.

- 4. Tactical Allocation

Active hiring and firing of securities is when mutual funds take temporary tactical shifts away from their long-run strategic allocations to capture short-run inefficiencies.

- o Example: A portfolio with a 60:30:10 split between equities:bonds:gold over long period, then for short time pump up the equities to 75% during an equity bull-rally where mid-cap stocks did well to revert back later.

#### Example Portfolios under Active Management

##### Aggressive Active Portfolio (Young Investor)

- o 70% Equities (actively selected mid-cap and growth equities)

- o 15% International stocks (Nasdaq 100, emerging markets)

- o 10% Debt (short term bonds for liquidity)

- o 5% Gold (for crisis hedge)

- o ACTION – We rotate among IT / pharma / energy based on valuations and where we are in the market cycle, Mid-caps have overweight when valuations are really attractive.

##### Defensive Active Portfolio (Retired Investor)

- o 40% Stocks (blue-chip paying-dividends, actively picked)

- o 45% Bonds (treasuries, Corp/BAA – All to mature within 5 years o 10% Cash full text here

- o 10% Gold (as a hedge against inflation)
  
- o 5% Cash (for immediate requirements)
  
- o Manager Action: De-risk during recession, increase allocation to defensive sectors such as FMCG and Utilities.

### Advantages of Active Portfolio Management

- Possibility of Better Profits: Professional managers can generate returns that beat benchmarks — especially in situations such as India during volatile or inefficient markets.
  
- Flexibility: Managers have the potential to react fast to geopolitical developments, policy shifts or company-specific news.
  
- Risk Management: Managers can get out of poorly performing assets sooner than passive funds by actively monitoring.
  
- Customizability: Active portfolios allow investors to actively manage their own goals (e.g., growth, income and preservation).

### Limitations of Active Portfolio Management

- Expensive: Since active funds have a higher turnover rate there are usually higher expense ratios, management fees and transaction costs associated with active trading.
  
- Greater Risk: Mistakes in choosing stocks and timing can cause underperformance.

- Consistency Challenge: There are managers who excel in some years, but few can consistently beat the market over decades.
- Behavioral Dependence: It is very dependent on the discipline and skill of the fund manager.

#### 4.2.2 Meaning and Approach of Passive Portfolio Management

Passive portfolio management is a core philosophy of investment that contrasts with active management. Rather than trying to outperform the market through stock selection, or timing or choosing sectors, passive investing is all about building a portfolio that will give you essentially the same returns as an entire index like the Nifty 50, S&P 500 or FTSE 100. The theory behind the strategy is rooted in the Efficient Market Hypothesis (EMH), which states that all public information has already been factored into asset prices. As such, continued market-beating returns through active choice are very hard to come by and generally not worth the increased cost and effort.

In passive management, portfolios are built using funds that mimic a specific index or an exchange-traded fund (ETF) corresponding to the same securities in the same proportions as an internally chosen benchmark. For example, if the Nifty 50 has an allocation of 12 per cent to Reliance Industries, a Nifty 50 index fund would also give it a weightage of 12 per cent. Consequently, the performance of the portfolio is almost identical to that of the index.

#### Principles of Passive Portfolio Management

- Index Replication

Portfolios replicate an index's constituents and weights.

o Example: A Nifty 50 index fund which invests in all 50 companies at the same proportion as in the index and therefore its returns are aligned with market averages.

- Low Turnover

As passive funds rebalance only when the index itself gets revised (or rather when firms enter or exit an index), there is little trading there as well. This lowers transaction costs and tax consequences to investors.

- Cost Efficiency

Fees: As compared to actively managed funds, passive funds have very low management fees. ETFs in India typically have expense ratios of 0.05–0.2%, whereas active funds may charge 1–2%.

- Broad Diversification

Through an index, a passive portfolio essentially gains exposure to multi Now we put those adjusted beta together to calculate our high alpha score.

companies. This mitigates risk that is specific to the company and enables investors to participate in overall economic growth.

- Long-Term Focus

Passive investing is based on the truth that markets mostly go up over time. By holding broad-based indexes for years, investors compound without trying to time the market.

### Example Passive Portfolios

Indian Passive Portfolio (Moderate Investor, 35 years of Age)

- o Nifty 50 Index Fund – 60% (Exposure to domestic large cap space)

- o 20% Nifty Next 50 ETF (which moves into mid-caps)
  
- o 10% Gold ETF(its the crisis hedge and inflation protection)
  
- o 10% Inv o 10% Debt Index Fund (g-bond index)

Result: Offers balanced investment in Indian equity market, safety through debt and diversification in gold at a very low cost.

Global Passive Portfolio (Aggressive Investor, 30 Years old).assertNull( Allow me to explain this further.

- o 50% S&P 500 Index Fund (US large cap companies, Apple Microsoft Amazon)
  
- o 20% MSCI Emerging Markets ETF (exists to achieve more exposure in China, Brazil, South Korea etc.)
  
- o 20% Nifty 50 Index Fund (as a home-country allocation for familiarity and stability)
  
- o 10% Bond Index Fund (government bonds from around the world)

Outcome: It provides global diversification, mixing Indian, US and emerging markets with the stability of debt.

Retired Investor (65 years old) Who is a Conservative Passive Portfolio Manager

- o 40% Government Bond Index Fund
  
- o 30% Nifty 50 Index Fund (blue chips equity exposure for growth higher than inflation)

- o 20% Gold ETF (preserves capital in time of crisis)
  
- o 10% In Liquid Fund (for liquidity requirement in short term)

Outcome: Emphasizes stability and consistent income with modest exposure to growth.

### Advantages of Passive Portfolio Management

- Simple and Transparent: Investors will always know what securities they own and can expect performance that mirrors the index.
  
- Cost Effective: Lower costs decrease the amount of return taken by an investor. Over decades, that makes quite a difference.
  
- Diversification: Owning a variety of companies and sectors lessens unsystematic risk.
  
- Predictability: There's no fear of bad fund managers making foolish decisions – the portfolio is just a replication of the market.

### Limitations of Passive Portfolio Management

- No Outperformance: Passive portfolios do not outperform the market; namely, they yield no alpha.
  
- Risk in Downturns: Since the portfolio will follow the index, it will also crash in market downturns. For instance, Nifty 50 index funds crashed by more than 35% during March 2020 when the index collapsed.

- **Poor Companies Included:** Investors cannot avoid weak companies, as index construction is beyond their control. If the index contains unattractive or overpriced businesses, the portfolio needs to own them.

- **Little Flexibility:** Passive solutions are unable to benefit or protect against short term opportunities and threats, which is not the case with active management.

#### 4.2.3 Key Differences: Cost, Effort, and Strategy

As we consider various dimensions—cost, effort, and strategic approach—we can say more about the difference between active portfolio management and passive.

- **Cost:**

Active management increases costs because there are fees for managing, the research costs to select stocks and transaction costs as a result of doing a lot of trading. In contrast, passive management is cost-effective with low fees and

minimal turnover.

Example: An actively managed fund might have a 2% expense ratio, while a passive index fund could come in at below 0.2%.

- **Effort and Involvement:**

Active management requires substantial labor on the part of managers to monitor markets, prepare research and portfolios so as they make numerous changes. Passive management is relatively low maintenance as portfolios are revised only when the index is changed.

This contrast has the effect of democratizing passive investing for retail investors without a lot of time or skill.

- Strategy:

The active strategies are designed to generate investment returns that surpass those of the market by selecting stocks, timing and with tactical management.

adjustments. Passive strategies have a goal of matching the market's return, under the belief that markets are relatively efficient.

Accordingly, active strategies are far more flexible, whereas the passive strategies focus on discipline and consistency.

The other dimensions are variance in risk and performance. Active strategies have the opportunity for more upside and downside, depending on manager skill. Passive strategies give more consistent market-level performance yet can't beat it. Moreover, active management can react swiftly in the face of market shocks; passive will live with downturns without intervention.

Knowing the differences helps investors decide which strategy best fits their financial goals and what they can handle in terms of risk.

#### 4.2.4 Performance Evaluation: Benchmarks and Alpha

Assessment of portfolio performance is critical to investment management because investors need a measure by which they can judge whether their chosen strategy (active or passive) is reaching the goals established for it. The absolute return of a portfolio (e.g., +10% annual return) is meaningless unless it can be compared to an appropriate benchmark. Performance measurement thus depends on benchmarks, the definition of alpha, and quantification of risk-adjusted returns.

#### Role of Benchmarks

The benchmark is a market index that you compare your portfolio returns with. It is a benchmark by which to measure whether the portfolio is underperforming, meeting or outpacing the general market.

- Examples of Benchmarks:

- o Indian equity funds → Nifty 50 / Sensex

- o U.S. large-stock funds → S&P 500

- o Worldwide diversified equity funds – → MSCI World Index

- o Debt funds → Government Bonds Index

It's important to select the proper benchmark. Nifty 50 should not be compared with small-cap portfolio as the risk and return parameters are different. Rather the Nifty Smallcap Index would be suitable for this purpose.

#### Alpha: Assessing Outperformance in Active Management

The purpose of active portfolio management is to obtain a return in excess of the benchmark. The difference between the return and the benchmark is alpha.

- Formula:

- Example:

If an equity mutual fund gives 12% in a year and Nifty 50 provides 9%, then the alpha is +3%. On the other hand, if the portfolio returns 7% and the benchmark earns 10%, then alpha equals -3%; it indicates the investment underperformed.

A positive alpha over and over again suggests the fund manager is earning his/her keep through skillful stock picking, market timing or sector rotation.

### Passive Portfolios\_Instead of alpha, Think Tracking Error

Passive portfolios are designed to mimic benchmarks, not beat them. As such, their analysis centers on the tracking error – how far off a fund's performance is from its benchmark.

- Example:

An index fund that covers the Nifty 50 should sport a 10% return, ideally. If the fund provides 9.8%, tracking error is negligible suggesting efficient replication. A greater spread (e.g., 9% vs.10%) reflects an ineffective management of funds.

A low tracking error indicates that passive management is being achieved very efficiently.

### Risk-Adjusted Performance Evaluation

Absolute alpha does not suffice, because one has to assess the returns on a relative basis given the specific risk one has taken. Several measures are used:

- Reward to risk ratio (Reward per unit of total risk) :

Excess return divided by standard deviation.

o For Example: Two funds are giving 12% and 10%. If the first is twice as volatile, the second might have a higher weekly sharpe ratio and therefore be better on a risk-adjusted basis.

- Treynor Ratio (Return to Systematic Risk):

Uses beta (market-related risk) in place of total risk. Useful for evaluating well-diversified portfolios.

- Jensen's Alpha (Risk-Adjusted Alpha):

Excess measures compared with the Capital Asset Pricing Model (CAPM) predictions. If Jensen's alpha is positive, it is evidence of true manager skill.

### Consistency of Performance

Another important factor is consistency:

- Active managers can beat the market one year only to lag in another. For example, a fund might outperform the benchmark in 2021 as a result of sector rotation, but underperform when circumstances shift in 2022.
- Passive funds offer predictability, performing largely in sync with the index over cycles.

So, investors need to consider whether an active manager's alpha is the product of true skill or just a friendly market cycle.

### Portfolio Performance Examples

#### Active Indian Equity Fund

- o Benchmark: Nifty 50 → 9% percentile return
- o Portfolio return: 11%

- o Alpha: +2%

- o Sharpe ratio: 0.9 (above benchmark's 0.6)

→ Signifies true talent and above-average risk-adjusted return.

Passive Index ETF

- o Benchmark: S&P 500 → 8% return Congratulations, average investor!!!

- o ETF return: 7.9%

- o Tracking error: 0.1%

→ Shows that the replication of the index is very efficient.

Aggressive Active Portfolio (International)

- o Benchmark: MSCI Emerging Markets → 7%)

- o Portfolio: 10% return, twice as volatile as the index.

- o Sharpe ratio less than benchmark → optimum not efficient, risky.

#### 4.2.5 When to Choose Active vs Passive Strategies

Whether an active or a passive strategy is the most appropriate approach depends on the investor's aims, capabilities, risk tolerance and investment philosophy. Neither is intrinsically better and ideal depends on where the system operates.

Investors might seek an active management when:

- They want to beat the market and are willing to take on more risk. These are not suits to be taken lightly by passive investors shopping around for financing.
- They believe in taking advantage of market inefficiencies.

Developing markets can frequently give talented managers an opportunity to make alpha.

- They are exposed to professional fund managers, and are willing to pay more for it.

Wealthy individuals/institutions can trust professional management team.

Alternatively, investors may choose passive management when:

- They seek modest and predictable returns at low cost.

It's a perfect set-up for the typical retail investor with no leverage.

- They're consistent with the efficient market hypothesis and acknowledge the challenge of consistently outperforming. In developed markets, passive investing tends to outpace active funds once costs are subtracted.
- They like the stability of long-term compounding without worrying about actively monitoring and trading. Passive strategies are also used for price stability in retirement planning portfolios.

Some investors are extractionists, meaning they use a mix of passive and active strategies. One way they might do that is by holding a core portfolio in a more stable long-term fund, while actively managing some of those funds to tactically take advantage of opportunities.

In the end, it comes down to money, potential return, time devotion and personal preference. Active management provides flexibility and the possibility of greater gains, but with higher costs and risks. It's the active management that generates outperformance, but is also inconsistent and unpredictable, therefore of no appeal to me. Cost efficiency, predictably, simplicity and minimizing potential for error form bedrock desires when investing (best chance of long term success.)ihil!

### **“Activity: Designing a Dual Portfolio Strategy”**

Imagine you are tasked with designing two investment portfolios for a client—one using an active management approach and another using a passive approach. For the active portfolio, select specific sectors or companies that you believe will outperform in the coming year. For the passive portfolio, choose an index to replicate. Compare the potential advantages and risks of each strategy. In your response, explain which portfolio you would recommend to the client and why, considering cost, risk, and long-term sustainability.

## 4.3 Responsibilities of Portfolio Managers

Trust is a key issue when it comes to the work of investors, who manage the financial resources of individuals, corporations and institutions. There's much more to their job than pulling the levers on stocks or bonds; it includes understanding clients, planning and managing a diversified portfolio, monitoring risk, keeping communication open and adhering to regulations. As fiduciaries, portfolio managers are required to act in their clients' best interests at all times. This requires professional skill, ethical behavior and a willingness to commit to long term value creation.

### 4.3.1 Client Needs and Goal Identification

The primary and most paramount duty of a portfolio manager is to comprehend the requirement of the client, in line with which investment strategies are crafted. A nondescript objective tends to create dissatisfaction with a decently performing portfolio.

To start, the client receives comprehensive financial profiling. This would include income, expenses, savings, assets, liabilities and other obligations. Personal factors also play a role, including age, stage in career development, lifestyle ambition and family duties. For example, a younger investor with operating income might look for capital appreciation, while an older retiree might be more interested in protecting that dorodoma.

Risk appetite also needs to be married to risk capacity by portfolio managers. Risk appetite is psychological tolerance for loss, risk capacity is financial ability to bear it. When the two are not in harmony, it can cause issues: for instance, people with high appetite but low capacity to bear risk might suffer more than necessary when markets turn down.

Crucial elements of this step are:

- Financial Profiling: An analysis of current and projected income, debt payments and net worth.

It allows managers to gauge how much discretionary income can actually be invested.

- Goal Setting: Ascertaining whether the objectives are focused on growth, income, or having a stable investment.

Each goal requires a different mix of investments and kind of strategy.

- Time Horizon Analysis: Defining goals as either short, medium or long term.

There is no reason you shouldn't invest the way you do for a three-year glide path vs. a 20-year retirement plan.

- Cash Needs: Factoring in emergency savings and short-term costs.

Among these reasons is having an easy access for the client to funds he needs without any long-term investments being disturbed.

These judgments must be revisited on a regular basis because goals and risks evolve over time. A marriage, children, a job change or even health crises can make priorities change dramatically. Goal congruence is, therefore, an ongoing

When an investor's objectives and risk tolerance are identified, the next stage of the portfolio management process is portfolio composition—selecting and allocating asset classes and securities that best meet the investor's goals. A well-diversified portfolio aims to give the investor a moderate return, for the amount of risk taken, suitable for their individual ability and willingness to take on risk.

Diversification is the cornerstone of this approach. The logic is straightforward: spreading investments across a variety of assets, sectors and geographic areas helps investors hedge the risk of any one bet gone awry. Diversification does

not send away risk entirely but it does make sure that losses in one place are counterbalanced by stability or gains elsewhere, which promotes smoother long-term performance.

(Table 1) Stage 1: Allocation of Assets (Macro Design)

The most important decision at the outset in crafting a portfolio is its allocation of capital across major asset classes such as stocks, bonds, real estate, commodities (including gold), and cash.

- A growth-based investor may set aside 70% of portfolio to equities, 20% to debt and 10% to gold/alternatives with focus on long-term wealth building.

- A conservative investor could also inverse the allocation with 60 per cent in debt, 25 per cent in equities and 15 per cent in gold/cash to focus on stability and income.

This percentage varies by the investor's investment horizon, stability of income and tolerance for volatility.

### Step 2: Selecting Securities (Micro-Level Design)

Among asset classes, managers select individual securities or funds:

- **Stock Selection:** Chosen on fundamental and technical analysis. The large-cap stocks (such as Reliance Industries and Infosys) provide stability, mid- and small-caps contribute growth, while international equities (like S&P 500 ETFs) bring in global diversification.
- **Bonds:** Options vary according to maturity, yield and credit rating. Government securities provide safety, with high-rated corporate bonds striking a medium point between yield and risk.
- **Real Estate/REITs:** Offer inflation protection and income. For smaller investors, REITs serve as a way to get exposure to real estate.
- **Commodities/Gold:** As inflation or panic hedges. Gold ETFs and sovereign gold bonds are popular.
- **Liquid Cash:** Savings bank account, treasury bills, or liquid funds provide liquidity in case of need.

### Step 3: Risk-Return Balance

It's just that every portfolio must have a mix of high-risk, high-return assets (equities, alternatives) and safer, usually income-earning ones (debt, deposits). The aim is not to maximize risk-free returns, but rather to optimize risk-adjusted returns.

- Example: A portfolio that is 80% stocks might have better returns — more of the time — but also worse declines in crises. The inclusion of 20% bonds and gold decreases volatility with little loss of return over the long term.

#### Step 4: Diversification Principles

Diversification occurs at multiple levels:

- Variety of Asset Classes: Products mixing stocks, debt, bullion and realty are designed to reflect different economic cycles.
- Diversification by Sectors: Combining technology, healthcare, consumer staples and energy mitigates the risk of a concentration. For instance if IT does not do well, FMCG should continue be stable.
- Across geographies: Investors are protected from domestic economic shocks by means of international diversification such as US tech stocks and emerging market ETFs.
- Among Investment Styles: Combining growth stocks with value stocks, or active funds with passive index funds, adds another layer of diversification and risk spreading.

Example: A person investing only in Indian banking stocks is exposed to sectoral risk. The broadening into IT and FMCG, global equities improves the robustness of overall portfolio.

#### Step 5: Practical Considerations

- **Liquidity:** A proportion of assets must be held in cash or near-cash form, to reduce the risk of having to sell long-term investments when you need funds.
- **Fees:** An overemphasis on high-fee funds or illiquid alternatives can eat into net returns. A substantial reduction in cost Low-cost ETFs and index funds can generally make a major difference in efficiency.
- **Tax Implications:** Equity selection has to be based on capital gains tax regulations, dividend taxes and tax REIT (Real Estate Investment Trusts), etc.

### Example Portfolios

#### Aggressive Growth Portfolio (Young, Age 28)

- o 70% Stocks (50% of domestic diversified funds, 15% mid cap funds and 5% in global ETFs.
- o 15% Debt (corporate bonds, debt funds)
- o 10% Gold ETFs or gold sovereign bonds(GBS)
- o 5% Cash equivalents

Reasoning: The long-term nature of compounding benefits from exposure to equities. Gold and debt are supplying some downside cushion.

#### Balanced Portfolio (Mid-Life Investor, 45 Years Old With Family Responsibilities)

- o 50% Stocks (let's pretend that it is a combination of large-cap funds and dividend-paying stocks)

- o 35% Debt (Govt securities, high rated corporate bonds)
  
- o 10% Gold (for inflation protection)
  
- o 5% Liquid funds

Why: Trade off growth for balance of long term goal and stability for family duty.

Portfolio (65-year-old retired investor)

- o 25% Equities (blue-chip, dividend-paying companies)
  
- o 55% Fixed (bonds, deposits and bond like funds)
  
- o 15% Gold (a store of value and a hedge)
  
- o 5% Immediate Cash for urgent requirements

Reason: Preserves capital and produces steady income, at low-exposure to growth.

Portfolio Adaptation

Portfolio-building is not a snapshot, it's a continuum. The market dynamics, interest rates and the investors' own situation evolve. For example:

- If bull market, equities get heavy → rebalance.
  
- Adjust gold or commodity exposure up if inflation moves higher.

- As an investor nears retirement age, equity allocation should slowly fall and more money should go toward bonds.

#### 4.3.3 Ongoing Risk and Return Monitoring

Well, a good portfolio can be a bit like an unwatched pot. It is also essential to monitor and realign the structure of the portfolio on a regular basis, in line with changing market conditions. Monitoring means to keep track on returns and risks, because markets are not constant over time and neither are client situations.

In the performance measurement stage, portfolio returns are first measured against benchmarks. This clearly indicates if the portfolio is under-performing, equal, or over performing to the market. Such tools as alpha (excess above the benchmark), Sharpe ratio (return per unit of risk), and beta (sensitivity to market direction) are often used.

Risk monitoring is equally important. Multiple risks are facing a portfolio, for instance those of:

- Market risk: Losses from fluctuations in stock prices or macroeconomic conditions.
- Credit Risk: The risk that issuers of bonds in a portfolio default.
- Liquidity Risk: Inability to sell assets rapidly without a significant loss.
- Inflation Risk: Loss in real value of returns over time.
- Geopolitical Risk: Political and/or regulatory developments affecting the financial markets.

Asset managers conduct stress tests and scenario analyses to evaluate how portfolios may fare under various adverse conditions.

Rebalancing is a crucial part of ongoing maintenance. In case there is a strong increase in the value of equity securities, their weight will become greater than desired and thereby risk. Rebalancing consists of selling overweight assets and buying more of those that are underweighted.

Apart from market-driven corrections, monitoring has to address client-driven changes. When clients need money on short notice for emergencies, or their goals change because of retirement or business expanding rapidly, the portfolio itself needs to be adjusted by the manager.

Hence, the surveillance serves to keep portfolios dynamic, responsive and sufficiently robust against the unknowns.

#### 4.3.4 Communication and Reporting to Clients

Good portfolio management, in other words, goes beyond tech choices – you need to 'talk the walk' to your clients. Because clients are placing their wealth in the hands of managers, they deserve routine communications, transparency on risks and fees, as well as performance.

Key aspects of communication include:

- Performance reporting: Providing periodic information that compares the performance of a portfolio to certain benchmarks. That gives clients a sense of how well their investment is doing.
- Risk Disclosure : Describing the market's risk and potential down side stories.

Clients should be ready for volatility as opposed to being shocked during downturns.

- Portfolio changes: Disclosing portfolio balancing or security choices with customers. Each decision must be based on a motive, a reason.
- Client-Centric Update: Connecting updates to personal goals, like saving for retirement or education.

That in turn makes reporting more valuable than the average market commentary.

- Teaching Role: De-mystifying complex financial terms for clients.

This provides them with enough information to make educated decisions, and creates trust in the manager's knowledge.

Communication must not be restricted to "paper reports. Regularly scheduled meetings or consultations offer chances for more in-depth discussions and alignment. In times of market instability though, overcommunication is crucial; silence can lead to panic and fear.

Contemporary technology from online dashboards to mobile apps also helps by providing clients with up-to-date information on how their portfolios are doing. Nevertheless, human contact is still necessary to engender that level of long-term confidence.

Open communication: Honesty from portfolio managers builds confidence, show accountability and professionalism, hence they increase prospects' trust.

#### 4.3.5 Regulatory Compliance and Performance Transparency

Investment managers are required by regulation to work within stringent guidelines intended to safeguard investors and promote fair dealing. They are not guidelines, they should be followed as a fundamental duty which goes hand in hand with their fiduciary responsibility to always put the best interest of clients first.

Key's compliance and transparency obligations include, among others:

- Compliance with regulations: The limits of investments and exposure are defined by the financial authorities.

This does not lead to over concentration or needless risk taking.

- Disclosure Requirements: Clear disclosure to clients about fees, risks and portfolio performance.

This guarantees that decisions are drawn from correct and pertinent information.

- Being Ethical: Steer clear of insider trading, conflicts of interest and self dealing. "Managers need to put client welfare ahead of their own self-interest."

- Performance Disclosure: Disclosing gross/net figures as the profit/loss.

This is so clients have a clear view of the true cost on their returns.

- Paper Trail: Keeping a clear trail of transactions, communications and checks for compliance.

This is necessary for audits and conflict resolution.

At the heart of compliance is fiduciary duty. Portfolio managers have a duty to be loyal, prudent and fair. They should not obfuscate performance nor hide risks, as it materialy destroys trust but could also yield juridicial consequences.

International diversification also means you must be familiar with cross-jurisdictional compliance, such as taxes and reporting. If they work with international assets, fund managers need to stay abreast of many jurisdictions.

Transparency with regards to reporting of performance also improves trust. Managers strengthen accountability by contrasting portfolios against benchmarks, disclosing tracking errors and honestly explaining underperformance. To honesty clients are easier return, and even when everything is not rosy.

Compliance with securities regulation and transparency are tools to protect the interests of the client and maintain investor confidence, and reinforce the integrity of financial markets.

#### 4.4 Fiduciary Duties in Portfolio Management

Fiduciary responsibilities constitute the moral and legal foundation of portfolio management. A fiduciary is an individual, corporation or government agency with the responsibility to manage assets on behalf of another person or entity with decisions made in the best interest of the client. Fiduciary duties in the management of a portfolio require that managers act with loyalty, care, candor and fairness when dealing with client investments. These responsibilities help to make sure that portfolio managers can't abuse their position of trust in pursuit of personal wealth, and that everything they do is consistent with the client's investment objective.

##### 4.4.1 Concept of Fiduciary Responsibility

The basic idea behind fiduciary responsibility in portfolio management is trust. Clients hand over their wealth to managers with the expectation that it will be managed responsibly and in their best interests. Fiduciary describes a situation in which one person (the portfolio manager) is responsible for the best interest of another (client).

This obligation is more than just contractual—it's the legal and moral thing to do. In contrast to the mercenary relationships of business in which everyone looks out for himself, a fiduciary relationship calls for the manager's disinterestedness. Portfolio managers may not subjugate their profit, benefit or preference to that of the client.

Fiduciary responsibilities generally entail the following core principles:

- **Honesty and Fair Dealing:** Managers must act in good faith. Clients demand honesty, not catch-as-catch-can in their financial affairs.
- **Best-Interest Standard:** Decisions should be designed to maximize the benefit of clients, not managers. For instance, suggesting a low-cost fund in place of a high-fee product that benefits the manager.
- **Responsibility:** Fiduciaries are answerable for their decisions and the results of those choices. Without demonstrating due diligence, they cannot pass the buck to market conditions.
- **Transparency:** Clients should be made aware of risks, fees and investment strategies. Hidden fees or undisclosed practices also violate fiduciary obligations.

The fiduciary idea is what separates portfolio managers from run of the mill brokers or advisors who might work under a suitability standard. While brokers are merely required to ensure that investments are “suitable,” fiduciaries must make sure they are “best suited” for the client’s interests.

This is why fiduciary duty provides the sinews of professional portfolio management; it ties both parties to a connection founded on loyalty, honesty and prudence.

#### 4.4.2 Duty of Loyalty and Acting in Client’s Best Interest

Loyalty forms the most fulsome of all fiduciary duties. The duty of loyalty stipulates that portfolio managers put their client’s interests first, even before concerns about personal financial matters, or any other consideration. This obligation is key to maintaining trust in the fiduciary relationship.

The duty of loyalty is present in various forms:

- **Avoidance of Self-Dealing:** Managers should not recommend securities that would enrich them personally at the expense of the client.

For example, recommending a product because it has more commissions is disloyalty.

- **Bias-Free Behavior:** Actions should not be based on a preference or partiality for one over another.

Recommendations of investments are to be made solely on merit, and in adherence with a client's wishes.

"Client Objectives Are Everything: A manager's own opinion should never top or supersede a client objective," he says.

There's no way a low-risk bond investor should be invested in risky equities because he needs income.

- **Conflict Resolution With the Client:** If there is a conflict that cannot be avoided, it should be disclosed to the client and resolved in their favor.

Managers also have a duty of loyalty rule that mandates the protection of confidential client information. A serious infringement is the passing on of data to third parties without consent or taking advantage of it personally.

If fidelity were the only guiding principle, a portfolio manager with a choice between investing in an index fund that charges very little and one of his own firm's high-fee funds would be only as comfortable doing the latter if he can demonstrate to himself that it is really what is best for the client—even if it generates much larger commissions.

The concept of responsibility, can be multiplied by loyalty and delivers accountability so that a client feels safe handing their money over to professionals.

#### 4.4.3 Duty of Care and Skill

If loyalty warrants the ethical match, the fiduciary duty of care and skill ensures professionalism. This duty obliges portfolio managers to exercise the degree of care, skill and prudence that would be expected from a prudent professional in comparable circumstances.

Professional care and skill are expressed by various aspects of portfolio management:

- Prudent Know-What: Select investments for allocation between risk, return, and client suitability.

Wanton or imprudent speculation about the markets, or slavish adherence to fads constitutes a breach of this obligation.

- Ongoing Monitoring: Portfolios should be monitored on an ongoing basis to ensure they are consistent with goals and market conditions.

Failure to rebalance following meaningful market moves shows it came from a lack of caring.

- Expertise: Managers need to stay up to date on financial instruments, laws and market trends.

Missing the boat on growing trends like ESG (environmental, social and governance) investing can depreciate client value.

- Risk Management: Plans should be built and tracked with tactics to manage volatility, credit risks and inflation.

Duty of care is also about knowing your limits. If managers do not have knowledge about such things then they should get external advice rather than make ad hoc decisions.

For example, if a client needs international exposure, an effective manager would study global funds, consider currency risks and consult experts rather than buying random foreign investments.

This high calling ensures that portfolio managers possess both the goodwill of a client's best interests and also are highly trained -- protecting all clients in ways that honesty alone cannot offer."

#### 4.4.4 Full Disclosure and Avoidance of Conflicts of Interest

Fiduciary liability also requires full disclosure of material facts to the client. This would cover disclosure of possible risks, charges, commissions or any factors that may affect decision making. The choice facing clients has always had to be an informed one, and if material facts are withheld they simply cannot make that choice.

Fiduciary relationships confront few issues more serious other than conflicts of interest. That's where the conflict comes in: when what the manager wants for himself, or for his firm, isn't aligned with what the client needs. Fiduciaries are not only obligated to divulge these conflicts, but "duty bound" to reduce or eliminate them.

Common conflicts include:

- Sales Driven Recommendations: Recommending a product that is not ideal for the client, and may be driven by sales commission.
- Proprietary Products: Pushing clients into in-house funds that enrich the firm.
- Personal Trading: Taking trades for oneself before client transactions.
- Outside Relationships: Accepting payment from corporations to promote their securities.

To address these, managers must:

- Open Up: If there's any hint of conflict, make it known to clients.
- Request Permission: Ask for consent before taking these conflicted action.
- Client First: Reconciling the conflict will always be to achieve what is in the client's best interest.

For instance, if a manager is compensated more for recommending Fund A than for Fund B and the latter is cheaper and a better fit, the duty of loyalty dictates that he recommend Fund B.

Through full disclosure and conflict avoidance, portfolio managers safeguard trust with clients along with the nature of a fiduciary relationship.

#### 4.4.5 Ethical and Legal Implications of Breach of Duty

Failing to fulfill fiduciary obligations has both business and moral implications. As trust is the foundation of fiduciary relationships, violations do injury not only to specific clients but also to the credibility of financial markets generally.

Ethically, they are conflicts of duty or violations of professionalism. When clients hand their wealth over to managers, it's with the understanding that they will be treated loyally, respectfully and transparently. When they misbehave, by hiding risks, abusing confidential information or putting their own interests first, these trusters are betrayed. Actions like this may ruin reputations and business relationships.

Fiduciary violations can result in litigation, regulatory fines and professional punishment. Fiduciaries are strictly regulated by financial regulators, and **failure to adhere to regulations** can **result in penalties**, suspension **or** banning. In the worst cases, violations can seem criminal, as in fraud or insider trading or willful deception.

Types of Breach Implications The implications of breaches can be classified as:

- **Judicial Sanctions:** Fines, lawsuits or criminal charges.
- **Financial Impact:** Liability, return of loss amounts and reputational harm resulting in client redemption or withdrawal.
- **Professional Impact:** Disqualification of licenses, ejection from professional organizations and harm to careers.
- **Ethical Foul:** The undermining of trust in financial advisors and portfolio management as a profession.

For instance, if your portfolio manager intentionally masks the risk of a “high yield but regardless rudimentary investment” and you lose part of your money, the fund manager will have lawsuits and regulatory fines to pay, gaining also disrepute in the marketplace.

As a result, fiduciary breaches are not mere errors and mistakes - they entail serious ethical, legal and professional costs to remind portfolio managers why it is important to behave as though you mean to apply the principle of fiduciaries properly.

### Knowledge Check 1

Choose the correct option:

1. What does fiduciary responsibility primarily emphasize?
  - a) Self-interest
  - b) Client trust
  - c) Market timing
  - d) High returns

## 4.5 Summary

☐ Portfolio management is an organised way of investing according to the clients objectives, risk and time preferences.

Investment Objectives and Time Horizon ☐ The basis of portfolio construction is to articulate clear investment objectives and time horizon.

☐ Managers need to balance the psychological readiness and financial capability of taking risk using risk appetite and financial profiling.

☐ Asset allocation is the bedrock of your portfolio performance and underpins the long-term risk-return profile.

☐ Diversification: The process of managing risk by investing in a variety of asset classes, sectors and geographies to minimize losses.

☐ Return, risk, liquidity and cost -detailed security selection.

☐ Portfolio management is active when attempting to beat a benchmark through the use of research and market timing.

☐ Passive portfolio management, in which managers track indices closely and focus on cost-minimization and predictability.

☐ Portfolio management is for the continuous supervisory work, rebalancing and risk return analysis.

☐ Open communication and consistent feedback develops trust and ensures the client knows what is happening.

☐ Fiduciary duty involves loyalty, care, full disclosure and avoidance of conflicts of interest.

☐ Failure to meet fiduciary responsibilities results in moral, legal, and ethical repercussions.

#### 4.6 Key Terms

**Portfolio:** A group of financial assets held by an investor or institution.

**Asset Allocation:** Allotment of investment among major asset categories to achieve a balance between risk and return.

**Diversification:** Investing in multiple assets to limit the risk exposure of an entire portfolio.

**Alpha:** The excess return of a portfolio relative to the return of a benchmark index.

**Beta:** The level of sensitivity of a portfolio to the market.

**Sharpe Ratio:** Return divided by risk taken.

**Rebalancing:** Changing weights of assets in a portfolio to their original levels.

**Active Management:** Investment strategy that intends to beat the market based on selection and timing.

**Passive Strategy:** Strategy that concentrates on the matching of performance to the market index.

Fiduciary Duty: A obligation ethically and legally to act in the client's best interest.

Conflict of Interest: Any instance where personal interests conflict with those of clients.

Legal And Financial Standards Of Portfolio Management: Follows the law and financial regulation as they relate to portfolio management.

#### 4.7 Descriptive Questions

Describe the process of building an investment portfolio.

1 Explain active portfolio management and compare it to passive portfolio management.

Explain the role of portfolio managers in providing satisfactory service to clients.

What does fiduciary responsibility mean for managing a portfolio? Explain with examples.

Explain how diversification adds stability to a portfolio.

Discuss the importance of monitoring and rebalancing to keep a portfolio efficient.

Describe the ethical and legal considerations of a breach of fiduciary duty.

How does clear communication and transparency help bring out the best in a client-management relationship?

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#### Knowledge Check 1

1. b) Client trust
2. b) Duty of loyalty
3. c) Apply skill and prudence
4. b) Accepting commissions
5. a) Legal penalties

#### 4.9 Case Study

Mr. Arjun Sharma, a MNC senior executive at 45 year age, visited the portfolio management company to create his investment plan. His objectives: to finance his daughter's college education in 8 years; buy a vacation home in 10 years and ensure that when he retired, at age 67, he would receive \$4,500 per month after taxes for the rest of his life.

enough money saved for retirement by 60. He had investible assets of ₹2.5 crore, a moderate risk appetite to boot and dislike for making money on the sly (ethically inclined), guiding his investments: He does not like investing in tobacco, gambling and weapons industries, among others.

The portfolio manager, Ms. Rao, conducted a thorough analysis of Arjun's financial situation. His

income was steady and increasing annually, and he had no substantial debt. His investment time frame was long term, but he needed the liquidity for educational expenses. After analyzing his

are, Ms. Rao suggested a diversified basket: 55% in equities, 30% in fixed income, 10% investment in real estate investment trusts (REITs) and the balance in liquid funds.

The equity part was focused on growth-oriented space like tech, renewable energy & healthcare i.e., as per Arjun's preference ethical and sustainable investing. The fixed-income portion was invested in government bonds and high-rated corporate debt for stability and to create certainty of returns.

predictable income. REITs provided diversification and an inflation hedge, while liquid funds provided immediate access to short-term needs.

The portfolio had been doing really well during the first two years with equities giving double digit returns.

But when the market turned south, his tech holdings cratered and devastated 85% of the total portfolio. Arjun wrote in with a query about whether he should be actively reallocating his education fund to some safer investment. Ms. Rao said the response called for discipline, diversification and rebalancing instead of panicked selling. She rebalanced the portfolio to increase the component of bonds and decrease that of equity, making it more relevant for Arjun's medium-term requirements.

Another hurdle came when the firm sold proprietary mutual funds with higher fees. The

management pressured Ms. Rao to sell those funds, which carried lucrative commissions. Yet they went against her fiduciary responsibility as cheaper alternatives that still served the same purpose were out there. Maintaining the duty of loyalty, Ms. Rao did disclose this to Arjun, recommended the inexpensive funds and would not prioritize firm profits over client interests. This built confidence/fostered trust and consolidated the reputation of the firm as being ethical.

By regularly monitoring, focusing on using ethical selection processes for funds and armed with discipline over the next decade with provided.

clear communication that helped Arjun's portfolio to reach goals of his education & home along with creating a robust retirement corpus.

## Problem Statements and Solutions

Problem 1: How to balance long-term growth with short-term need for liquidity.

Solution: A combination of equity funds for added growth and liquid funds to meet immediate needs was used so that near-term goals would be achieved without impacting long-term performance.

Problem 2: Market slides imperiling medium-term goals.

Solution: Rebalancing into bonds amid volatility steadied returns yet left some exposure to stocks for a rebound.

Issue 3: Conflict of interest due to commercial products.

Answer: Ms. Rao acted as a fiduciary when she said no to expensive in-house products and proposed client-focused choices allowing for transparency and trust.

### Reflective Questions

How do portfolio managers reconcile conflicting objectives of growth, liquidity and stability?

What is the kind of support that diversification can provide to clients during market volatility?

What does a Fiduciary Portfolio Manager do in case of conflict of interest?

What is the effect on client confidence of the sharing of information during downturns?

Would the best approach to managing in Arjun's case be active or passive? Why?

### Conclusion

This case provides an example of the multiple roles of a portfolio manager. Beyond technical

competencies in distribution and risk management, fiduciary obligations and trustworthiness is the hallmark of the profession. Disciplined strategies, solid research and successful experience have helped us face market downturns.

risks via watchful monitoring and rebalancing, managing ethical conflicts so as to preserve investors' trust, portfolio managers add value when they manage money in the most efficient manner.

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## Unit 5 Types of Risk in Investments

### Learning Objectives

1. Understand the concept of investment risk and its relevance in financial decision-making.
2. Identify and explain the different types of risks associated with investments, such as market risk, credit risk, and liquidity risk.
3. Analyze how systematic and unsystematic risks affect portfolio performance.
4. Evaluate the impact of inflation and interest rate changes on investment returns.
5. Examine the role of diversification in mitigating various types of risks.
6. Assess strategies for measuring, monitoring, and managing investment risks.
7. Differentiate between controllable and uncontrollable risks in investment planning.
8. Apply risk analysis to real-world investment scenarios to align with investor goals and risk tolerance.

### Content

- 5.0 Introductory Caselet
- 5.1 Systematic Risk
- 5.2 Unsystematic Risk
- 5.3 Diversifiable vs. Non-diversifiable Risks
- 5.4 Importance of Risk Identification and Management
- 5.5 Summary
- 5.6 Key Terms
- 5.7 Descriptive Questions
- 5.8 References
- 5.9 Case Study

## 5.0 Introductory Caselet

Ramesh was a 40-year-old small owning proprietor in Pune and he had just received ₹15 lakhs from by selling his ancestral land. Since his business was doing well, he thought it would be a way to provide some financial stability for his family. His two children still had to go through the school system, and there is no great plan about how I might afford their education in eight to 10 years, along with my own retirement,” he writes. Like many, conservative investors, his impulse was to invest the money in instruments that he considered completely “safe.”

His preferred options were fixed deposits (FDs) with nationalized banks and government bonds. This investment was stable and promised returns, which provided a lot of comfort to him. But, upon consulting with his financial advisor on this plan, he was amazed that these vehicles, though secure, are not risk free. They had inflation risk, the adviser said — as prices rise over time, their purchasing power of that fixed interest income would be eroded. Plus, bonds carry interest rate risk; as rates rise, the value of the bonds he owns will go down — and he could miss out on better investment opportunities.

The adviser then introduced the concept of equity investing and mutual funds, which deliver better long-term growth potential. But they weren't without risk, either. With equities in such a downward spiral, market risk influence is strong, as prices are influenced by the ebbs and flows of the economy, politics or business. So there's also elements of volatility risk, if the price suddenly swings and you're going to have short-term but very significant falls in value. Though these were the risks that made Ramesh nervous, the adviser reminded him that equities gave him the best chance to beat inflation over time.

Ramesh also wanted to invest in real estate because owning a house was always associated with security within his family. But, his adviser underscored that he was taking liquidity risk with this approach. It's likely very hard to rapidly unload real estate at a decent price in the event of a financial emergency. There is also concentration risk in real estate, of course: If he invests a lot of his money in one property and the local market there weakens, he can lose.

Also, his guide discussed credit risk (applicable when investing in corporate bonds or say a company fixed deposit). And even the most familiar companies can miss payments as their financial condition deteriorates. Finally, the adviser cited reinvestment risk, specifically with fixed deposits. When the FD matures and if interest rates are lower, Ramesh may have to invest in an FMP that yields a lower return, thus reducing his expected earning.

On hearing this, Ramesh understood there was nothing like a “risk-free” investment. Every instrument had its own risk — some unmistakable, some hidden. The key was not to eliminate risk altogether but to come to understand,

gauge, and control it is diversification. A mix of equities, bonds, liquid funds and a smaller part in real estate may give him stability along with some growth.

What Ramesh learned from the discussion was this: Fear of risk is not the key to investment success, but understanding the types of risk and how to make the right decisions when it comes to them.

Critical Thinking Question:

If you were an investment advisor to Ramesh, how should his portfolio be designed so as to manage different types of risk (inflation, market, credit, liquidity and reinvestment) adequately and yet achieve his medium-term (education expenses) and long-term (retirement)?

## 5.1 Systematic Risk

**Systematic Risk** Systematic risk is a type of investment risk that is characteristic of an entire market or system. It is due to wide economic (economic), political, and global constraints, and it cannot be removed with diversification. They have to control systematic risk mainly by choosing asset allocation and hedging, with long-term investment strategies.

### 5.1.1 Definition and Nature of Systematic Risk

7 **Systematic risk is the risk** that impacts an **entire market** in addition to a portion of the market. It comes from macroeconomic factors outside rather than inside the company. This sort of risk is part of the financial system, and it exists no matter how diversified a portfolio may be. The type of risk is systemic, which means that even if you're well-diversified across sectors or asset classes, it is not a risk one can avoid because most risks in this category are related to the underlying functioning economy and/or government systems.

6 The fundamental difference **between systematic risk and unsystematic risk** is that the former **can never be diversified away**. Whereas unsystematic risk is due to things like a company's management decisions, product recalls, operational errors, etc., Systematic risks include those caused by fluctuations in GDP growth rates, inflation, interest rates and exchange rates among other factors on global scale. This risk is pervasive — it considers the entire world of finance and results in co-movements among asset prices, making it crucial for portfolio management.

Systematic Risk Characteristics Some of the most important characteristics of systematic risk are : 1.

### Understanding Systematic Risk



- **Market Wide Exposure:** Systemic risk arise from limited resources, inflation or government local situation that affect the total economy. Asset prices move together for example in a worldwide financial crisis like the one we are experiencing.

- **Non-Diversifiable Risk:** Since the risk is systemic, every well-diversified portfolio can not eliminate it all. Although the diversification limit the exposure to firm-specific news, it does not protect investors against market-wide declines.

12  
2

- As Measured By Beta: In financial models, such as the Capital Asset Pricing Model (CAPM), beta measures a security's exposure to market risk. Beta greater than 1 implies higher volatility compared to the market average, while a beta less than 1 indicates lower volatility.

- Relationship to Expected Returns: Greater systematic risk causes investors to require greater expected returns in return for taking on the added risk, which affects the prices of securities.

In our increasingly integrated world, the risk is not neat and national. And globalization has created finances so interlinked that economic shocks in one region can swiftly rock the world. Policy modifications and international trade agreements, combined with cross-border capital movements, make this risk systemic as well. Whether 'time varying' or not, systematic risk should be considered a permanent and unavoidable characteristic of investment opportunities in the financial markets of today.

#### 5.1.2 Market Risk: Economic, Political and Sentimental Contributors

Market risk is the most evident type of systematic risk as it captures how macroeconomic factors, including policy and investor mood, impact returns across an asset class. Market risk can be divided into three main categories—economic factor, political factor and mood—all contributing to the financial markets.

GDP growth, unemployment rates, inflation and consumer confidence are considered economic indicators that influence the health of an economy. Earnings expectations fall amid deteriorating economic indicators, and asset prices sink across the board. When data is strong it implies the market will rise as investors become confident. This boom and bust behavior is a clear reflection of how inextricable financial markets are from the broader macroeconomy.

Politik. Political factors are also very important. Elections, shifts in official policy, new regulations or international trade deals all generate uncertainty that can shift markets broadly. Geopolitical conflicts, tariffs and sanctions can disrupt worldwide supply chains, change the balance of trade and create market volatility among relations nations.

asset classes. These types of events are challenging to forecast and not controllable by individual investors or companies, but they have market-wide consequences.

Sentiment factors are those related to the psychology and manner in which people invest. Investor sentiment, herd behavior and speculative demand can push asset prices away from their inherent values. Times of "irrational exuberance" or panic selling tend to be when markets trend up the most or down the most, resulting in bubbles or crashes. There is nothing fundamentally driven about sentiment risk obviously. If anything, sentiment risk illustrates the human side of financial markets and how consensus perceptions can drive prices in the absence of any big economic or political changes.

Key points about market risk:

- **Global Integration:** Events in one major market can spark reactions elsewhere, producing cascading effects throughout global financial systems.
- **Technology Disruptions:** Inventions or sudden advances in technology may bring about sweeping industry resets that drive system-wide market changes.
- **Disasters (Natural and Pandemic):** Earthquakes or pandemics interrupt production operations and investor confidence globally, which has a knock on effect in financial markets.

To understand market risk, you have to understand how these economic, political, and sentiment-driven factors interact with one another to produce systemic movements. Investors can employ tactics such as sector rotations, global asset allocations or hedging instruments to reduce some of the exposure, but they won't eliminate it because risks are inter-related.

### 5.1.3 Interest Rate Risk

Interest rate risk is the threat of losses to investment values as a result of interest rate changes. Since they affect borrowing costs, asset values, and investor attitudes, changes in

the level of interest rates can shift wealth among sectors of the economy—between households and companies, for example. Interest rate policies allow central banks to manage inflation and heat up or cool down economic growth, which in itself immediately has an impact on the value of bonds, equities and other assets.

Bond prices fall and move in the opposite direction of interest rates, rising when rates drop because new issues pay less than older ones. On the other hand, when interest rates fall, bond prices rise. This inverse correlation leaves bond investors vulnerable to rising and falling interest rates. Stocks are also impacted as stocks' valuations are discounted back to present value using these interest rates in pricing models. As a result,

stocks fall as interest rates rise, especially for indebted companies.

Another important channel is through borrowing costs. Higher rates raise the cost of consumer loans, mortgages and corporate financing. That can help slow consumption and investment, which ultimately depress corporate earnings and economic growth. Conversely, lower rates can spur borrowing and spending that drives asset prices up.

Major components of interest rate risk are:

- **Duration sensitivity:** Long term assets or projects are more sensitive if the interest rate changes than short-term ones. That sensitivity is called a bond's duration, and investors use it to control their exposure to interest rates.
- **Yield Curve Dynamics:** As the shape of the yield curve flattens, steepens or inverts these dynamics provide expectations for changes to economic conditions and may inform investment decisions at a portfolio level.
- **Anticipations Effect:** Future interest rate changes that are expected can effect a sell-off or buying in the investment community so that there is possibly an expedited situation.

It is also a model example of how monetary policy decisions ripple through a financial system, affecting the valuations of bonds, stocks, real estate and currencies. It is a key

component of market risk, which needs to be actively managed (e.g. by diversification across maturities or the use of interest rate derivatives, and/or by controlling portfolio duration.

#### 5.1.4 Inflation Risk

Inflation risk, which is another name for purchasing power risk, exists when inflation erodes the value of money. This risk is of particular concern to fixed income investors whose interest payments won't keep pace with inflation. Inflation is a drag on the real return of investments and can destroy long-term financial plans if it is not considered.

In fact, a high-inflation environment renders fixed-income securities like bonds unattractive given that their nominal payments will be worth less in the future than they are today. Equity investments may also come under pressure because companies confront higher input costs that could compress profit margins, particularly if they cannot pass them on to consumers. On the other hand, some real assets, like real estate or commodities or inflation-linked bonds succeed in an inflationary environment as hedges.

Inflation is also either anticipated or unanticipated. Planned inflation can get priced into interest rates and contracts, giving businesses and investors time to prepare. Unanticipated inflation, however, surprises the market and results in sharp price changes and increased volatility. Central banks typically react to inflation with higher interest rates, which can hobble economic growth and further deflate asset values.

Key points about inflation risk:

- **Fixed-Income Vulnerability:** Bonds and other fixed-income assets are particularly vulnerable when forced to make fixed payments in nominal terms.
- **Policy Response:** Central bank steps to address inflation — such as rate increases — can bring an extra dose of market volatility.

- Long-Term Planning: Pension funds, insurance companies and retirement portfolios need to factor in inflation assumptions to protect the purchasing power of payouts years into the future.

Knowing rising prices risk is important for making strong portfolios. Investors can protect themselves from inflation by investing in inflation-protected securities, diversifying into commodities or real assets and/or exposure to global markets where inflation is varying across countries.

### 5.1.5 Currency/Exchange Rate Risk

Exchange rate risk results from variance of exchange rates between currencies; it affects nations, businesses, and individuals that engage in international investing. In today's global economy, currency devaluations are a fact of life and can have profound effects on the returns from international investments, import/export businesses and multinational company profits.

For the investor with a New Zealand dollar-denominated holding, a strong home currency here undermines the value of offshore returns when they are translated back into dollars. A stronger home currency makes goods more expensive abroad for exporters, which can cut into sales and profits. On the contrary, importers gain by a stronger home currency as their costs decrease. These are real dynamics of how currency risk impacts the profitability and competitiveness of businesses around the world.

The portfolio diversification also suffers from currency risk. It's true that investing internationally can help spread risk around the globe, but it also introduces you to exchange rate volatility. Investors, and companies, like to hedge their bets such as using forward contracts or options or swaps in order to secure a fixed exchange rate and minimize uncertainty.

Key point regarding currency risk:

- **Commercial and Corporate Earnings:** Trade is the lifeblood of many global companies, but international corporations are exposed to transaction and translation risk – meaning distorted financial statements and cash flows directly as a result of exchange rate changes.
- **Economic Indicators:** Exchange rate changes are affected by interest rate differentials, inflation rates, and political stability.
- **Volatility Amplification:** During tumultuous periods when the world suddenly feels very unsafe, currency markets can do some quick pivots, adding a layer of risk for international investors.

Currency risk highlights the need to stay informed on macroeconomic events, to use currency hedging instruments and achieve a balance between domestic exposure and international market access in investment portfolios. In the globalized world no company can handle with exactly arranged budgets for more than six months, because all is happening so fast in.

### “Activity: Mapping Systematic Risk Across Asset

In this activity, students will explore real-world examples of systematic risk by selecting a recent macroeconomic or geopolitical event—such as a central bank interest rate decision, a major trade dispute, or a sudden inflation surge—and analyzing its effects on stocks, bonds, and currencies. Each group will identify which aspects of systematic risk were most prominent and explain how the event influenced asset prices across markets. The activity emphasizes that diversification cannot fully eliminate these risks and encourages students to think critically about the interconnectedness of global financial systems

## 5.2 Unsystematic Risk

Unsystematic risk is what is specific to a company, sector, or industry and isn't relevant to the market overall. It is also known as Diversifiable, Idiosyncratic, or company specific risk.

This risk type is associated with internal factors, such as management decisions or operations efficiency, financial policies, competitive posture and industry-related considerations. Unsystematic risk – Unlike systemic risk, un-systemic risk can be mitigated—even eliminated—by diversifying investments over many different companies and across sectors. It also mirrors the day-to-day risks that impact individual companies—things like product recalls, strikes or management turnover or sudden loss of a big customer.

Key characteristics include:

- **Company or Sector Specific:** Unsystematic risk is limited to the particular condition of a company or industry, and does not feel economy-wide.
- **Diversifiable:** Investors can reduce the unsystematic risk by holding diversified portfolio to balance company and sector exposures.]
- **Controllable:** Management policy, operational efficiency and strategic planning can affect the level of unsystematic risk.
- **Unsystematic Risk is Multidimensional:** Unsystematic risk factors on the business, financial, credit, legal and regulatory fronts are not a close-knit group having similar sources and affects.

The nature of unsystematic risk is that you can perform "active management". Investors and companies that understand from where it emanates can manage it with purpose, neutralise its impact on returns and guard against such surprises company or industry-wide.

### 5.2.1 Definition and Characteristics of Unsystematic Risk

1 Unsystematic risk is the random decisions and events that are **unique to a particular company or industry**. Whereas **systematic risk** is inherent in **the entire market**, unsystematic risk **is** contained within a smaller context. -it could be due to one of corporate governance, competitive dynamics, production or management. Such risk drives the volatility of returns on individual investments, but not necessarily the comovements across all firms.

In reality it is the type of risk that investor can exercise some control of through diversification. One investment may do poorly but can be compensated for by a similar, successful investment in another sector or geographical market. The reason is that company-specific events generally do not occur at the same time in all sectors and diversification then mitigates the effect.

Main features:

- **Company-Specific Concerns:** One company's poor management, labor strikes or loss of a key patent may hurt it but have no effect on other companies.
- **Industry-Based Concerns:** A regulation that applies only to one industry, say energy or banking, introduces an industry-specific unsystematic risk.
- **Shield by Diversification:** A diversified portfolio disperses exposure and mitigates the impact of isolated negative events.

Company-specific risk can also originate from the company's individual organization and approach. A company that relies more heavily on one product line to generate sales is exposed to greater unsystematic risk, for example. Also, firms entering hazardous markets or new technologies whose success wasn't tested may make themselves more uncertain. As the unsystematic risk is under the control of management, it reward good judgment, strong internal controls and healthy risk management systems.

### 5.2.2 Business Risk: Operative and Strategic Risks

Business risk encompasses all the unknowns a company contends with in its operations and strategic decisions. It, in turn, can be broadly classified into operational risk—risks that are a result of the day-to-day operations and resources—and strategic risk—risks associated with management choices and prospects for long-term positioning. This type of unsystematic risk specifically has an influence on both profitability and the cash flow as well as long term survival.

Operational risk is created by inadequate or failed internal processes, systems and human factors, or by external events that break down normal operating procedures. Among other causes, these include supply chain interruptions, system failures, cyber incidents and delays in production due to human error or quality control problems. For instance: A logistics business may face Operational risk when a key technology platform goes down, resulting in service outages and unhappy customers.

Strategic risk has to do with the strategic choices an entity makes about its future. These could be new markets, introducing a new product or service, mergers and acquisitions – even fundamental shifts to the business model. Bad strategy can dilute competitive advantage, shrink market share and damage financial health. A shop that is rushing to grow rapidly without doing research about the customer demand may lose its investments.

Key points with explanations:

- Efficiency: Efficient operations and strong internal controls result in a decreased likelihood of expensive shutdowns.
- Competence in Management: Good boss decision making and not blundering.
- Agility: Businesses that are able to move rapidly in response to new technologies, customer needs and competitive challenges will be better protected from business risk.
- Supply Chain Resilience: Diversification of suppliers and the creation of contingency plans decrease vulnerability to spots in any supply chain.

There is little dispute business-centric risk necessitates operational and strategic proactiveness. Regular audits, risk assessments, scenario planning, and crisis management exercises enable companies to anticipate and manage these uncertainties before they are allowed to do damage.

### 5.2.3 Financial Risk : Leverage and Capital Structure Concerns

Financial risks emanate from the manner in which a firm finances its day to day operations and investment decisions. It is mostly about the risks of excessive leverage, of mismanaging cash-flow and having capital structures that are not properly calibrated. Businesses that borrow heavily to finance their operations have fixed payments they must make in the form of interest and principal, regardless of whether they are bringing in revenue. If earnings are high, leverage can supercharge returns on equity. But in down times these obligations become very heavy which would mean escalating the losses and could push them into insolvency.

Liquidity risk (the inability to convert an asset into cash with a minimum of loss), and refinancing risk (the lack of new financing on acceptable terms when existing debt matures) are also included under financial risk. Such considerations are amplified in fast-moving credit markets where interest rates (among other factors) and market mood might shift quickly.

Key aspects with explanations:

- Debt Ratios: A high debt-equity ratio suggests more leverage, and therefore a higher risk of a loan default.
- Interest Coverage: A low ratio for this test indicates that earnings barely cover interest payments, which is a warning sign that the company could be under financial distress.
- Management of liquidity: Having a proper working capital and cash reserve is an important aspect in dealing with market volatilities.
- Optimal Capital Structure: An optimal combination of debt and equity minimizes cost of capital and risk.

Corporates manage financial risk by having conservative leverage, diversified funding sources, hedging interest rate and/or currency exposures, maintaining appropriate level of liquidity. Prudent fiscal management will help to meet such obligations even in the face of economic setbacks.

### Did You Know?

“Companies with excessive financial leverage are significantly more vulnerable during economic downturns. During the 2008 global financial crisis, many firms with high debt ratios were unable to refinance their obligations, leading to mass defaults and emergency restructurings. This demonstrated how leverage magnifies financial risk across industries.”

#### 5.2.4 Credit Risk and Default Risk

"Credit risk" is the risk that a borrower or other counterparty fails to meet its financial obligation as contracted causing a loss to the lender or investor. Default risk is a subset of that, with an emphasis on the physical inability to pay... principal and interest. These are risks of particular concern to banks, bondholders and suppliers who extend trade credit.

The probability of default is a function of the borrower's health, industry conditions and macroeconomic environment. Borrowers with lower credit scores are required to pay more in interest to cover the additional risk for lenders. In a time of economic distress, credit risk gets worse as defaults rise in all sectors and can reduce the value of fixed-income investments and weaken lenders' balance sheets.

Key points with explanations:

- Loan Criteria: Lenders analyze financial statements, projected cash flows and collateral to assess the borrower's repayment capacity.
- Ratings/Spreads: Lower-rated bonds typically trade at higher yields (spreads) than those of risk-free securities in order to compensate for perceived credit risk.

- **Diversification:** Lending or investing across a number of borrowers, industry sectors and geographic regions can help with that — it lessens the impact of any one default.
- **Credit Derivatives:** Instruments like credit default swaps enable lenders and investors to move or hedge the risk in lending.

Lenders can manage their risk by carrying out appropriate due diligence and tracking credit exposure. Active portfolio management and early-warning systems facilitate early detection of weakening borrower quality before defaults take place.

### 5.2.5 Legal and Regulatory Risk

**Legal/regulatory risk:** This is when laws, regulations or enforcement practices change in ways that can have a significant impact on company operations and financials. This risk may arise from fines for inconsistencies, litigation, new taxes or environmental conditions or regulations labour practices industry-specific restrictions etc. Since every industry is governed under a distinct legal regime, the legal and regulatory risk profile of companies are very different.

The initial challenge could differ in nature, such as new capital adequacy guidelines that impact the bottom line of a bank or more stringent environmental rules for an industrial company leading to investments in technology. There are also legal battles, class-action lawsuits or patent-infringement cases that can eat into resources and tarnish a reputation.

Key aspects with explanations:

- **Cost of Compliance:** New regulations often involve substantial expenditures for technology, personnel and work flows.
- **Criminal and Civil Penalties:** Violation of laws can lead to fines, criminal prosecution, or shutting-down.

- Image and Reputation Harm: Legal issues destroy stakeholder confidence and can affect relationships with customers, investors, and market value.
- Monitoring and Governance: The use of strong monitoring and governance can assist companies to get ahead in political regulations.

Regulatory and compliance risk management Ensuring legal obligations are understood, staff are trained, and using the services of a lawyer. Firms frequently form special compliance officers to police the law and plan ahead through industry regulations. In this way, they can minimize exposure to expensive penalties and protect their long-term sustainability.

### 5.3 Diversifiable vs. Non-diversifiable Risks

An investor can be assumed to face only diversifiable and non-diversifiable risks, all investment risks are comprised of these two categories. Knowing them helps investors manage their portfolios better. Unsystematic (or diversifiable) risk is company or sector specific and can be mitigated by simply spreading money across sectors. Nondiversifiable risk (or systematic risk) is the type of economy-wide or market-wide and affects all securities, which cannot be eliminated by holding other security. This is the essence of modern portfolio theory,

, which advocates that the investors to reduce diversifiable risk and get a premium for bearing non-diversifiable risk.

Key aspects:

- Diversifiable Risk: Idiosyncratic, associated with individual companies or industries; can be mitigated by using a diversified portfolio.
- Systematic (Nondiversifiable) Risk: Market wide, cannot be Diversified away.

- Investor's Playbook: Construct portfolios with a variety of exposure, but be mindful that diversification can help up to a point when there are market-wide events.

### 5.3.1 Concept of Diversification

Diversification is an element of a foundational risk management plan. It's about diversifying to many different areas of it so that bad performance in one area can be made up by good performance elsewhere. This isn't just a question of owning many investments, but rather about holding assets whose returns to the investor don't move in near-perfect lock step.

In reality, diversification decreases unsystematic risk by narrowing the distribution of returns around an average. If companies or sectors get hit with something unique, the losses on one investment could be offset by gains in another which would smooth out your overall return.

Key features with explanations:

- Risk Reduction via Uncorrelated Assets: The use of assets with low (or even negative) correlation, lowers total portfolio volatility. This is why investors blend asset classes (stocks, bonds, real estate, commodities).
- Efficient Frontier: Diversification is the cornerstone of something called by Modern Portfolio Theory the efficient frontier – a plot that lays out all the greatest possible risk-return trade offs.
- Non-elimination of systematic risk: There is still a correlation between investments, which means that market-wide events such as an interest rate increase or recession will influence all the investments.
- Worldwide diversification: Spread investing among geographic regions may dilute region specific or currency based risk.

Diversification also offers psychological benefits: it avoids a focus on any single holding or idea, and thus the emotional agony of losses. A diversified portfolio helps investors first do this by being able to focus on long-term objectives, not short-term gyrations in a single holding.

### 5.3.2 Unsystematic Risk as Diversifiable

Whereas unsystematic risk is company-, industry-, or sector-specific, which do not apply to the broader economy. While systematic risk (inflation, interest rate hikes, recessions) cannot be mitigated through diversification, unsystematic risk is unique and no diversifiable. Through diversification, having a prudently designed portfolio of investments across sectors and asset classes investors can mitigate or even eliminate the negative impacts of these specific risks.

This is why **unsystematic risk** is also known as **specific risk** or **idiosyncratic risk**. In reality, while a single **company or industry** may be severely impacted, investors that hold diversified portfolios will likely see losses mitigated as they are offset with gains elsewhere.

#### Types of Unsystematic Risk

There are several manifestations of differing unsystematic risk, each related to company- or industry-specific vulnerabilities:

##### Company-Specific Risk

These threats can be driven by managerial choices, performance, or company-centric circumstances.

o Instances: Flopped new product release, unscrupulous behavior, business scams or lawsuits.

o Case example: Satyam scandal (2009) in India destroyed shareholders' value. But diversified investors with IT, banking and FMCG exposure were not taken aback as they were able to restrict the overall portfolio damage.

### Industry-Specific Risk

Issues that impact a sector but not the economy.

o Examples: Regulations changes, the decline in a sector or segment, lack of raw materials to work with and transformational technologies.

o Case Example: Indian telecom industry when the prices were disrupted due to the entry of Reliance Jio. Some investors who owned banks, IT and pharma stocks along with telecom also saw lesser overall losses against those only invested in telecom.

### Credit Risk (Default Risk)

This is the risk that a company or bond issuer will default on its debt. It directly impacts fixed-income investors.

o Instances include corporate bond defaults or NBFC crises and non-payment of interest.

o Case in Point – The IL&FS default crisis (2018) spooked Indian debt markets. But the portfolios diversified in government securities, equity and gold brought down overall damage.

### Operational Risk

Originating from internal issues, mistakes, or process failures, operational risk has direct impact in a company's profitability.

o Examples: IT failures, cyberhoaxes, supply chain interruptions and labour walkouts.

o Case Example: A bank in the world having cybersecurity hacked may witness a dramatic decline in its stock price, but investors would have only marginal exposure as long as they were diversified across different industries.

### Diversification as a Mitigation Tool

Unsystematic Risk Diversification is the best way to protect against unsystematic risk. The concept is that as the risks associated with individual companies and individual industries are largely uncorrelated, when you add different securities together, this will reduce overall portfolio volatility.

- Within Industries: Owning many companies in the same sector decreases dependence on one company.

o Example: An auto investor invests in Maruti Suzuki, Tata Motors and M&M to diversify rather than putting in all money in a single company.

- Across Sectors: Including both defensive and cyclical sectors balances risk.

o Example: Technology and fast-moving consumer goods may move differently -with a slowdown in IT the FMCG sector still looks strong.

- Variation Across Asset Classes: Including bonds, gold or real estate can reduce reliance on equity returns.

o Example: Yep, last year in the COVID crash all your 'oofa' (i.e., stock) portfolios took a bath... decks were being cleared and what not. Except for those wu tang, where gold held up well; which meant real losses weren't nearly as damaging.

- Geography: International diversification minimizes the risk of a country.

o Example: A portfolio that matches Indian equities with U.S. tech ETFs, and Asian emerging markets has multiple engines of growth, so our investors are shielded from local shocks.

### Diminishing Returns from Diversification

Last but not the least it is noteworthy that diversification reduces a great majority of unsystematic risk, but reducing variance is subject to diminishing returns. Research shows that:

- It eliminates most company-specific and industry-specific risks. More is usually unnecessary since the remaining risk comes from market-wide and cannot be diversified away. Therefore some single-domain systemic can oppress – such as inflation or national economic growth. Secure a stock like bond, gold provide some positive models.

Examples:

Poor diversification equity portfolio – high unsystemic risk

- 80% – Indian telecom stocks ( Airtel, Vodafone Idea, RJIO related holdings)
- 20%- Indian banking

Outcome: highly exposed to regulatory and pricing risk: due to one sector costplagner.  
Sector-wide cost disruption wipe out most of the portfolio value

Well-diversified equity

- 20% – Banking & Financials

- 20%- IT & Technology
- 15%- FMCG
- 15% – Healthcare
- 10%- Industries
- 10% – Global equity ( US ETF)
- 10% – Gold ETF

Outcome: pharma slowdown is likely to depress returns, the FMCG and IT will give stability, the gold will provide a hedge.

#### Balanced Multi asset portfolio

- 50%- Equities across large-, mid, SM -caps + international ETF's
- 30%- Bond Govt. Security + AAA CorporateDes
- 10%- Gold
- 10%- Real Estate/REITs

Outcome: reduce a little exposure in company and domain-specific. Even if equities underperformed, bond and gold should give such stability PM sycho gym.

### 5.3.3 Systematic Risk as Non-diversifiable



Systematic risk, in contrast, has a broader impact as it strikes the entire market or even multiple sectors simultaneously. These can be macroeconomic factors like interest rate changes, inflation, exchange rates, or geopolitical events and recessions. Since these forces affect all firms to some extent, however, diversification does not eradicate systemic risk.

Specific sources of systematic risk are macroeconomic events such as a crisis, shocks in commodity prices e.g. oil and wars, or a consequence of changes to cash flows in an emerging economy. Even a very diversified portfolio loses money during such events, because the mechanism at work is all-pervasive.

Key points with explanations:

- **Macroeconomic Considerations:** Economic Growth, Unemployment and inflation are the larger market drivers.
- **Interest Rate and Inflation Exposure:** Higher rates increase borrowing costs and discount rates, leading to lower valuations across the stock and bond markets.

- **Political and World Events:** Wars, trade clashes or sanctions can send shock waves through global supply chains and shaking financial markets.
- **Systematic Risk and Risk Premium:** Since investors cannot diversify away systematic risk, they demand a return to bear this risk.

Systematic risk can not be eliminated, but can be managed. Tactics range from the use of derivatives to passive investing in defensive sectors or asset classes to modification of portfolio beta (the sensitivity to market movements). That is because, while diversification can guard against company-specific problems, investors still need to prepare for marketwide forces.

#### 5.3.4 Examples and Practical Implications for Investors

Here are few examples to illustrate the concept of diversifiable and non-diversifiable risks. And say an investor has all his or her money in a single airline. If airfares decrease, due to labour action or a surge in fuel prices, the investor becomes massively out of pocket. But if the investor is also holding stock in technology, consumer goods and healthcare companies, then losses from the airline may be counterbalanced elsewhere. This illustrates diversifiable risk.

Or, put it the other way round: Suppose a central bank raises interest rates dramatically to rein in inflation. This will flatten stock and bond prices in almost all sectors, even hurting diversified portfolios. Similarly, a global

pandemic disrupts supply chains and dampens worldwide demand, leading to losses across asset classes—this is undiversifiable risk.

Practical implications with explanations:

**Diversification Reduces Risk in Individual Companies:** By purchasing more than one stock you have less chance that any single company can negatively impact your investments.

**But Systemic Risk is Unpreventable:** There's no way to get away from market risk with your investments, and the best-diversified portfolios still take a hit when these global events happen.

**Asset Allocation Is Critical:** Dividing stocks, bonds and other assets within the portfolio to match an investor's risk tolerance.

**Risk Metrics application** – Investors use risk ratios such as beta, Sharpe ratio and standard deviation to measure their exposure to systematic and unsystematic risks.

Investors need to be realistic when it comes to diversification. It does not ensure a profit or protect against all risk, but mitigates volatility and smooths long-term returns.

### 5.3.5 Portfolio Strategy to Minimize Risk

Constructing an investment portfolio that reduces risk includes diversification, asset allocation and other diversifying tools. Diversification eliminates the unsystematic risk, and Systematic risk can be minimized with prudent allocation, hedging techniques, and consideration of securities which react differentially to market movements.

A balanced portfolio is normally dispersed among multiple asset classes like stocks, fixed income, real estate, commodities and sometimes alternative investments. Every asset class works differently in different markets, hedging diverse market situations.

Key strategies with explanations:

**Strategic Asset Allocation:** Setting long-term target allocations for various asset classes according to goals and risk tolerance.

**Tactical Moves:** Making short-term changes to allocations based on market conditions, like rotating more towards defensive sectors or raising cash.

Hedging strategies: Methods for decreasing potential losses caused by market fluctuations, typically through options, futures or swaps.

Rebalancing: Re-adjusting the portfolio to bring it back to its target allocation in order to keep the desired risk.

Emphasize Quality Assets Focusing on strong and stable companies, you can minimize the impact of system-wide shocks Choose securities with low volatility as well.

Behavioral discipline is also crucial. Investors should also be warned against emotional response to market moves and sticking to their plan. Risk adjusted performance measurements are used to facilitate the selection of assets and their continued monitoring. In the long-run, this disciplined capital allocation makes for a strong hull against both diversifiable and non-diversifiable risks.

### Knowledge Check 1

Choose the correct option:

1. Which type of risk can diversification reduce?
  - a) Systematic risk
  - b) Diversifiable risk
  - c) Inflation risk
  - d) Market-wide risk
  
2. Which factor makes systematic risk non-diversifiable?
  - a) Company-specific issues
  - b) Supplier delays
  - c) Macroeconomic events
  - d) Management errors

3. What does holding shares only in one sector expose an investor to most?

- a) Diversifiable risk
- b) Systematic risk
- c) Inflation risk
- d) Currency risk

4. Which strategy mainly targets unsystematic risk?

- a) Diversification
- b) Market timing
- c) Government policies
- d) Credit swaps

5. Which of the following is an example of non-diversifiable risk?

- a) Product recall
- b) Strike in one factory
- c) Global recession
- d) CEO resignation

#### 5.4 Importance of Risk Identification and Management

Confronting risk is central to genuinely profitable investing since it empowers individuals and organizations to see, being familiar with, as well as react for the uncertainties that necessarily accompany financial markets. Every investment involves some degree of risk — from minor price fluctuations to major, unanticipated losses caused by external events. By categorizing risks in a systematic way, investors can strategize how to react, avoiding damage where possible and exploiting first-mover advantages that develop as markets shift.

It's not only about defense; it is as much, if not more, about offense. By educating investors about the risks they are taking, they can better allocate capital; select suitable instruments and set reasonable performance expectations. This creates an imperative for risk management to balance with return seeking. It gives investors the ability to manage volatility, protect principal and put the portfolio behavior in harmony with their financial situation and psychological comfort.

Why we care about risk identification and management:

- **Clarity and Awareness:** By mapping their risk exposure, investors take stock of where they are vulnerable — and can act before issues spiral out of control.
- **Strategic Allocation:** Forecasting risk determines what proportion of the portfolio to allocate among different asset classes and sectors.
- **Preserving Capital:** Losses are tougher than gains; Gasherman demonstrates the importance of risk management, being able to protect the capital base from which returns bleed.
- **Long-Term Stability:** A steady, controlled strategy of risk gives investors the ability to stay in the market, exercising compounding over time versus selling on downturns.

Perhaps as it should be, but it does sound rather pid4kish to me. Managing risks is not a one off thing - it's an ongoing process. It includes the identification of risks, evaluation of their relative magnitude, planning for mitigation strategies, and follow-through to monitor results and adjust as necessary. By forcing this to become a regular part of their process, investors can let go of the feeling that risk is random and integrate it as a conscious feature in their plan to get rich.

#### 5.4.1 Role of Risk Profiling in investments Planning

Risk profiling is essentially a systematic process for measuring an investor's financial ability and willingness can take on the investment risk. It sets the stage for investment planning,

making certain that the selected mix of investments is compatible with an investor's tolerance and objectives. It depends on the definition! An appropriate risk profile is multi-factorial (e.g.: age, source of revenue, investment horizon, objectives, and emotional attitude towards volatility).

That process starts with understanding the investor's willingness to accept risk — which is a function of their financial circumstances, including current income and assets, liabilities and future cash flow needs. Then there is risk-taking, which is more subjective and has to do with how comfortable they are with losses and volatility. A profile based on both of these dimensions is more accurate than the profiles with any one dimension.

Key points with explanations:

**Risk Tolerance:** Someone with a high net worth, consistent earnings and very little need for near-term cash in their portfolio can tolerate more short-term variability without negatively impacting goals.

**Risk Tolerance:** Though a few investors are financially conservative while others are venture capitalist, risk tolerance varies among generation. Advisors must balance both.

**Time Horizon:** The longer the time horizon, more room there is for risk since short-term price fluctuations average out—over time.

**Investment Mandate:** One assembled for a retirement that is decades in the future looks very different from one designed to fund expenses in the near term.

Risk profiling may use questionnaires, simulations and interviews to assess how people respond to hypothetical losses or market movements, but it is important too look beyond these basics. The results contribute to how assets are allocated — such as: an aggressive risk-taker with 80% in stocks and 20% in bonds; someone more cautious would have the exact opposite.

reverse. Appropriate risk profiling also prevents exposure to too much risky assets and panic sell-offs when the market goes down because it accurately mirrors the investor's genuine psychological comfort level.

### Tools of Risk Measurement (e.g., Beta, Standard Deviation)

Risk assessment models allow investors to translate their qualitative perceptions of risk into quantitative measures, which they can use to compare securities, assess the stability of a portfolio and construct hypothesis about likely levels of risk-adjusted returns. These tools are crucial for the analysis of both systematic (marketwide) risk and unsystematic (security-specific) risk, and for asset allocation and portfolio construction.

Beta and Standard Deviation are two of the most popular measures, although more advanced investors also use Sharpe Ratio, Sortino Ratio, Treynor Ratio, Jensen's Alpha, Value at Risk (VaR), Maximum Drawdown. Collectively, these tools paint a full picture of risks and returns.

### Beta ( $\beta$ )

• Definition: How much a security's returns move in relative terms to the overall market.

• Formula:  $\beta = \text{Cov}(R_i, R_m) / \text{Var}(R_m)$

• Interpretation:

•  $\beta = 1 \rightarrow$  Security follows the market.

•  $\beta > 1 \rightarrow$  More volatility than market (riskier).

•  $\beta = 3 \rightarrow$  more volatile than the market.

## Standard Deviation ( $\sigma$ )

- Definition: Measures the overall volatility of returns by determining how much all actual returns will deviate from an average.
- Formula:  $\sigma = \sqrt{(\sum(R_i - \bar{R})^2 \div N)}$  where  $i=1$  to  $n$  FEM analysis The developed finite element model is then analyzed for obtaining the simulated results.
- Interpretation: A higher  $\sigma$  is an indication of less predictability and generally a larger risk.
- Example: A bond fund with  $\sigma = 3\%$  is not very risky compared to an equity fund whose standard deviation =15%.

## Sharpe Ratio

- Definition: Excess return earned per unit of total risk.
- Formula in words: Sharpe Ratio =  $(R_p - R_f) / \sigma_p$

o  $R_p$  = Portfolio return

o  $R_f$  = Risk-free rate

$\sigma_p$  = Portfolio standard deviation of returns

- Interpretation: Higher values reflect better risk-adjusted performances.
- Example: A fund with  $R = 12\%$  and  $\sigma_R = 10\%$ , a return on the risk free fund of  $R_f = 6\%$  has Sharpe  $(R - R_f) / \sigma = (12 - 6) / 10 = 0.6$ .

## Sortino Ratio

- Definition: Like Sharpe, with weight limited to downside volatility (negative risk).
  - Formula:  $\text{Sortino} = (R_p - R_f) \div d\sigma$
- $d\sigma$  = Downside deviation of returns.
- Interpretation: More closely tracks investor fears because it punishes only the worst outcomes.
  - For example, two funds of equal Sharpe ratio may have different Sortino ratios if one is characterized by greater frequency of downside moves.

## Treynor Ratio

- Definition: Measures return relative to  $\beta$ , not total risk.
- Formula:  $\text{Treynor} = (R_p - R_f) \div \beta_p$  Where  $R_p$  is Return of Portfolio  $\beta_p$  is Beta and  $R_f$  = Risk-free rate
- Interpretation: Demonstrates how effectively a portfolio rewards investors for taking market-related risk.
- For example, if  $R_p = 11\%$  and  $R_f = 5\%$  and  $\beta = 1.2 \rightarrow \text{Treynor} = (11-5)/1.2 = 5.0\%$ .

## Jensen's Alpha ( $\alpha$ )

- Description: It is a ratio of the risk adjusted performance to a portfolio's actual excess return compared to that predicted under CAPM.

- Formula:  $\alpha = R_p - [R_f + \beta_p(R_m - R_f)]$

- Interpretation:

- o  $\alpha > 0 \rightarrow$  Portfolio outperformed its expected return (manager has skill).

- o  $\alpha < 0 \rightarrow$  Below expectations: m.

- Example: If portfolio return is 13% when CAPM forecasted return was 11%, then  $\alpha = +2\%$ .

#### Value at Risk (VaR)

- Definition: An estimate of the highest possible losses on a portfolio over a given confidence level for a defined period of time.

- Sample Statement: "Portfolio will not lose more than ₹5 lakh in a month - 95% Confidence"

- Use: Banks and institutional investors often use them to control risks.

#### Maximum Drawdown (MDD)

- Definition: The greatest peak to trough fall of a portfolio prior to recovery.

- Formula:  $MDD = (\text{Trough Value} - \text{Peak Value}) \div \text{Peak Value}$

- Interpretation: Suggests exposure to particularly severe downturns.
- Example: If a portfolio reaches ₹10 lakh at its peak and then drops to ₹7 lakh,  $MDD = (7-10)/10 = -30\%$ .

### Applications of Risk Assessment Tools

- Unbiased benchmarking: Rule-based quantitative metrics serve as impartial benchmarks for comparing securities and portfolios.
- Portfolio Choice: Mixture of different 'β σ Assets' reduce total volatility, since Diversification may allow β Effects to partially offsetting each other.
- Adjust & Watch: Keep an eye on Sharpe, Sortino, or VaR and adjust as needed to keep risk in check.
- Predictive Insights: What can historical volatility and beta tell us about the way securities will behave in future markets.
- Evaluating skill: Jensen's Alpha and Treynor ratio reveal whether managers are making a genuine contribution.

### Example: Comparing Two Portfolios

- Portfolio A: Return = 12%,  $\sigma = 15\%$ , (= Return if S&P offer  $R_f$  on our treasure)  $\beta=1.1$  Then we should learn something  $\leq (R_f + \beta \cdot E)/\sigma$
- Portfolio A: Return = 12%,  $\sigma = 15\%$ ,  $\beta=1.1$
- Portfolio B: Return = 11%,  $\sigma = 8\%$ ,  $\beta=0.7$
- Sharpe ( $R_f = 5\%$ )  $\rightarrow A = 0.47, B = 0.75$  also get same sort).

- Treynor  $\rightarrow A = (12-5)/1.1 = 6.36\%$ ;  $B = (11-5)/0.7 = 8.57\%$  (B has superior market-adjusted performance).
- Jensen's Alpha  $\rightarrow$  Determines whether the risk-adjusted performance is attributable to superior manager skills as opposed to greater than average market risk.

#### 5.4.3 Risk Mitigation Techniques: Hedging, Insurance, Diversification

The essence of risk management in this sense is not gambling or risking more than what you can afford to lose, it's taking rational precautions to avoid risk. Hedging, insurance and diversification are three commonly used methods. Each serves portfolios in distinct ways related to investment risk, and they can be combined for added muscle.

Hedging employs financial instruments to swap potential losses. For example, someone holding foreign stocks might purchase currency futures to lock in the exchange rate and protect against unfavorable movements. Hedging is primarily useful for protecting against market-wide or price-based risks and may be customized for specific exposures.

Insurance is someone else taking on the risk. Such could be considered portfolio insurance or buying policies (e.g., annuities, credit default swaps) that pay off if bad things happen to the investor. Insurance does not prevent the loss, but reimburses or mitigates its financial consequence.

Divestification diversifies the risk among various assets, sectors and countries.

Diversification Using securities that don't move in perfect unison means you're less likely to suffer a loss across the board.

Key points with explanations:

- Hedging Tools: Options, futures and swaps help investors hedge the cost of price volatility, interest and/or currency rate exposure.

- Insurance Products: Credit default swaps for lenders or guaranteed income products for retirees act as insurance against certain risks.
- Diversification: It reduces un-systematic risk and averages out portfolio returns over time.
- Cost – Effectiveness Analysis. There are costs to each of these things, option premiums, transaction fees or insurance charges for example, and thus the protection should be compared to that cost.

These can be combined for layered protection. For instance, an internationally diversified portfolio might employ currency hedges for exchange rate risk and insurance products to financially protect one's life. They mutually make each other resilient to an array of uncertainties.

#### 5.4.4 Aligning Investments with Risk Tolerance

Ensuring investments are aligned with risk tolerance allows the portfolio to accurately represent the investor's ability and willingness to take on risk. When this is not the case, even a well-constructed one can cause anxiety and bad decisions when markets evolve. This is where investment vehicles, asset allocation and strategies are tailored to the individual investor.

Some things that can affect the way you feel about risk include your age, proven earning power, level of net worth, family responsibilities and how comfortable you are with the uncertainty of the markets. Youthful investors who have stable income and long time horizons are often comfortable with more risk, while older ones approaching retirement or counting on investments for income tend to prefer stability.

Key points with explanations:

Breaking down the financial goals: Not all goals have the same risk appetite. Retirement savings may be invested in diversified equity funds, but an emergency fund sits in liquid, low-risk assets.

**Time Horizon Impact:** Longer is better as longer horizons enable investors to withstand short-term pullbacks for greater long-term returns.

**Behavioral Insights:** It's a bit of psychology, with tools such as risk tolerance questionnaires and scenario simulations that show how an investor is likely to respond when the markets drop.

**Dynamic tuning:** As things change (new family, new job, new feeling about income), spreads had to be fine-tuned on a portfolio-by-portfolio basis in order to match the now-different level of tolerance.

Matching investments to risk tolerance also helps keep investors disciplined. When a portfolio aligns with psychological comfort, the investor is less likely to panic when downswings come and go and avoid the expensive action of selling low only to buy high. It's not a one-time thing and should continue to be reviewed and adjusted.

#### 5.4.5 Impact of Ignoring Investment Risk

Not paying attention to investment risk can have drastic results, literally defeating the purposes of wealth preservation and growth. When investors do not recognize or control risks, they may expose themselves to an amount of risk that is above their ability or willingness to assume and suffer heavy losses -or miss opportunities in the process. This neglect slowly eats away at financial security and depresses trust in investment.

Some of the main risks of disregarding investment risk are:

**The gradual Erosion of Capital:** Unmitigated exposure to risk can result in substantial losses—a devastating blow especially when investors are nearing retirement and they don't have the time to make up for the loss.

**Volatility Shock:** Misaligned portfolios against risk tolerance results in panic-based behavior evident by selling out near market lows.

Concentration: Without risk assessment, investors may be holding too much in a given asset or sector, amplifying losses in the event of an adverse scenario.

Missed opportunities: Over-estimating risk could lead to over-conservatism, which may result in lower long-term returns and missed growth.

Not accounting for risk also results in poor diversification. A portfolio that may seem diversified could still be highly correlated and susceptible to broad downturns. That's particularly risky during market crises, when asset correlations typically rise and everything loses at once.

Key points with explanations:

- Behavioral Impact: Investors who are not familiar with these exposures frequently will make emotional decisions that aggravate their costs.
- Lack of Liquidity: Arrogance or lack of foresight could result in holding illiquid investments, leaving little access to capital during urgent situations.
- Institutional Consequences: For businesses and funds, failing to control risk can result in regulatory fines, legal litigation and reputational harm.

At the end of the day, to ignore risk is tantamount to giving up control over investment results. The integration of risk recognition and management into the planning process can make risk less elusive, turning it from potential, behind-the-scenes danger to a defined, manageable element in an investor's strategy.

## 5.5 Summary

☐ Investments have systematic (non-diversifiable) and unsystematic (diversifiable) risk which need to be identified and controlled, in order to meet long term goals.

☐ Systematic risk, or market-related risk-This risk is caused by those factors that have an economy/political or financial-global impact.

19 § Is composed of Company or Industry specific issue § Can be reduced or removed by Diversification.

Diversification ☐ Diversification is a central concept of risk stemming which allows the dispersing off, diversifying or spreading the risk that minimizes on any single item who's performing less well.

☐ Risk Profiling: The investment decisions are modelled based on investor's capacity to take risk and willingness to stomach uncertainty and volatility.

Risk measurement devices such as beta, standard deviation, Sharpe ratio, and Value at Risk enable to estimate exposure and volatility.

☐ Risk control techniques such as diversification, hedging, insurance and regular rebalancing of the portfolio should be employed to create or maintain the risk-return profile.

☐ Matching investment risk tolerance keeps everyone grounded and prevents head-in-the-sand moments when markets get volatile.

☐ Failure to account for risk can result in erosion of capital, inefficient allocation of resources, euphoric investing and failure to accomplish financial targets.

☐ Asset allocation, hedging and regular updating play a vital role in the portfolio management to reduce the risk factor, whether it is diversifiable or non-diversifiable.

☐ Portfolios must be continually monitored and adjusted to reflect changes that result from personal circumstances and external conditions.

Efficiently identifying and managing risk creates resilience, greater consistency of performance and the ability for investors to realize long-term goals with confidence.

## 5.6 Key Terms

**Systematic Risk:** The risk on the whole market due to macroeconomic conditions, (and global conditions) that cannot be diversified away.

**13** **Nonsystematic:** A risk associated with a particular company or industry that can be eliminated by diversification.

**Diversification:** Dividing investments among different types and sectors of assets so as to limit exposure to a particular risk.

**Beta:** This is a measure of how much an investment can be expected to rise or fall when the market moves.

**Standard Deviation:** Statistical measure of dispersion about the mean.

**Sharpe Ratio:** Risk adjusted return of an investment comparing the excess returns with the risk taken by an investor.

**5** **Value at Risk (VaR):** The estimate of the potential loss during a period, at a confidence level, given normal market conditions and no trading in markets in which securities or other assets are traded.

**3) Hedging:** The use of market strategies to protect against risks associated with an existing position.

**Insurance** -A contract that transfers risk from a policyholder to an Insurance company.

**Risk Profiling:** The process of determining whether an investor can manage, and is willing to trade-off their financial expectations in the future for higher returns today.

**Risk Tolerance:** The amount of risk and fluctuations in value that an Investor is willing to endure as he/she seeks to meet Investment objectives.

**Portfolio Rebalancing:** Taking your assets back to the initial distribution of the original risk invested.

## 5.7 Descriptive Questions

Discuss the systematic and unsystematic risk along with an example.

Explain how diversification lessens nonsystematic risk and why it cannot eliminate systematic risk.

Discuss the importance of risk profiling in investment planning and how it influences portfolio decisions.

Explain the importance of beta and standard deviation in determining investment risk.

Explain the primary methods used to reduce exposure to investment risk.

So how can investors best position their portfolios to match their own risk tolerance?

Q2: Describe what happens if you ignore investment risk in determining long-term financial wellness.

Describe how portfolio techniques can be used to reduce both the non-diversifiable and the diversifiable risks.

11 5.8 References

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Knowledge Check 1

1. b) Diversifiable risk
2. c) Macroeconomic events
3. a) Diversifiable risk

4. a) Diversification
5. c) Global recession

## 5.9 Case Study

### Background:

Arun, a mid-career man with a robust 20 years of investment arm-age, put together a portfolio predominantly in Indian automobile sector, which was also his belief system for eternity. But with regulatory developments on emissions, a global deficit of computer chips and higher interest rates globally, his portfolio performed poorly in successive dramatic underperformances. The Arun: A case study to demonstrate risk identification and management as ideas may apply to patients like Arun, looking to re-balance their portfolios while taking active measures toward reducing future risks.

### Detailed Narrative:

Arun was an early automobile stock investor, swayed by their impressive run. His high-conviction portfolio delivered heady returns at first. But his failures to diversify left him more exposed to numerous risks. The chip scarcity took a heavy toll on production throughout the sector. New emission rules pushed up compliance costs for carmakers, and global economic tightening curbed demand for cars. Arun happened to have a longer horizon, but the short term volatility and drawdowns were really starting to affect his confidence, resulting in impulsive behavior and missed opportunities.

Three levels of risk are exposed using the principles of risk identification and management:

- Unsystematic Risk: He could be unduly exposed to just one sector, thus his portfolio is more vulnerable to specific troubles in that industry.

- Systematic Risk: Far-reaching issues such as increasing interest rates, inflation and global demand cycles that affect a whole stock market.
- Behavioral Risk: Emotional response to volatility resulting in erratic investment behavior.

Arun's financial planner put together a comprehensive strategy:

- Doing a risk profiling exercise to match his portfolio with his actual tolerance and time frame.
- Using risk assessment tools like beta and standard deviation to measure how volatile each holding is — as well as the portfolio.
- Adding risk reduction methods – diversification to tech, healthcare and consumer staples among sectors; fixed-income instruments for reduced volatility.
- Creating a portfolio plan with automatic rebalancing to ensure your asset allocation targets and avoid putting too much of your capital into one sector.

This systematic methodology turned Arun's portfolio into a well-diversified and robust blend of assets which met his objectives.

Problem Statements and Solutions:

(Problem 1) Excessive Specialization in One Sector

- Solution: Spread investments across different sectors and asset classes. Start introducing index funds or ETFs to get exposure to the broader market and not rely on the auto sector.

## Issue 2: Exposure to Systematic Risk

- Solution: Consider fixed-income securities and low-beta defensive stocks. Utilize derivatives, like index options to manage downside risk at times of bear market trends.

## Issue 3: How You Reacted Behaviorally To The Volatility In The Market

- Solution: Develop investment policy statement that includes defined asset allocation and risk parameters. Automate contributions and rebalancing to avoid acting on impulse.

### Reflective Questions:

What might Arun have done differently with his portfolio, when he initially structured his investments, to avoid this over concentration risk?

What risk assessment tools would you recommend that Arun use to best know his portfolio's vulnerability to market turmoil?

How can diversification and hedging methods be combined to combat both specific and systematic risk?

What are some tactical changes Arun could make to keep from getting too emotional in a whipsaw market?

Why is it important to rebalance on a regular basis so you stay aligned with your risk tolerance and investment objectives?

### Conclusion:

This case demonstrates how, over time, applications of risk identification and management can transform a small concentrated, high-volatile portfolio into a diversified resilient one. By identifying diversifiable and undiversifiable risks, by using quantitative techniques, and by matching investments with your tolerance for risk, you can gain more consistently from your investments and do so with greater confidence. Risk management is not about abolishing risk; it's about knowing it, quantifying it, and offsetting risks to realize long-term goals. Arun's experience offers us a lesson: Investing is not just about pursuing returns, it's also about managing risks.

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## Unit 6 The Risk–Return Trade-Off

### Learning Objectives

1. Understand the fundamental concept of the risk–return trade-off and its relevance in investment decision-making.
2. Explain how different levels of risk correspond to varying levels of expected return.
3. Analyze the relationship between asset classes, their inherent risks, and historical return patterns.
4. Evaluate how investor risk tolerance influences portfolio construction and expected returns.
5. Identify factors that shift the balance between risk and return in changing market conditions.
6. Apply the risk–return trade-off concept to compare investment alternatives and make informed choices.
7. Assess the impact of diversification on modifying the risk–return profile of a portfolio.
8. Develop strategies to optimize returns while maintaining acceptable risk levels in line with investment goals.

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- 6.0 Introductory Caselet
- 6.1 Principle of Risk Premium & Investment Decisions
- 6.2 Factors Affecting the Risk–Return Relationship
- 6.3 Efficient vs Speculative Risk
- 6.4 Practical Examples of Risk–Return Combinations
- 6.5 Summary
- 6.6 Key Terms
- 6.7 Descriptive Questions

6.8 References

6.9 Case Study

6.0 Introductory Caselet

Ritika is a 27-year-old software engineer living in a metro city. With a steady job and disposable income, she wants to grow her savings and achieve financial independence by her mid-forties. Motivated by articles and social media discussions about high returns, Ritika decided to invest almost her entire surplus income into high-growth technology stocks and small-cap mutual funds. Her rationale was simple: at a young age she can afford to take risks, and higher risk brings higher returns.

Initially, the strategy seemed to work. Over the first few months, her portfolio appreciated sharply as the

technology sector boomed. Encouraged, Ritika added even more money to the same set of investments. But soon market volatility increased. Interest rate hikes, global uncertainties, and sector rotation away from

technology caused her portfolio to lose nearly 20% of its value in a matter of weeks. This sudden reversal left her anxious and questioning whether she should continue investing in such high-risk instruments. She even considered moving all her funds into fixed deposits or recurring deposits, which offer low but stable returns.

When Ritika sought help from a financial advisor, he explained the risk–return trade-off in detail: while higher-risk assets tend to offer higher potential returns over the long term, they also come with larger

fluctuations in value. Conversely, low-risk assets like fixed deposits provide stability but very limited growth.

The advisor highlighted that the key is not choosing one over the other, but building a balanced portfolio

aligned with her risk tolerance and time horizon.

He proposed that Ritika diversify her investments by allocating a portion to equity index funds, some to

government bonds or high-quality debt funds, and the rest to stable cash instruments for emergency needs. This structure would reduce her exposure to sector-specific risk, moderate the swings in her portfolio, and still allow long-term growth potential. The advisor also guided her on setting realistic return expectations and

rebalancing her portfolio periodically to maintain her chosen allocation.

Ritika realized that her earlier approach was driven by the assumption that being young automatically meant taking maximum risk. She understood now that the real advantage of her youth was time to grow wealth

gradually and recover from downturns, not necessarily chasing the riskiest assets. By applying the

principles of the risk–return trade-off, she could create a diversified plan tailored to her goals and comfort level, avoiding panic decisions during market volatility.

Critical Thinking Question:

If you were Ritika’s financial advisor, how would you design a portfolio allocation strategy that reflects her age, income stability, and long-term goals while balancing the risk–return trade-off? What factors would you prioritize and why?

## 6.1 Principle of Risk Premium & Investment Decisions

The principle of risk premium tells us that investors would demand higher returns for accepting higher uncertainty. This is where the risk–return trade-off comes into play, in assuming a return while comparing investment opportunities and making rational decisions. It also provides the basis of asset pricing models including the Capital

Pricing Model (CAPM).

### 6.1.1 Concept of Risk–Return Trade-Off

The **risk–return** tradeoff suggests that higher level of uncertainty in investment returns has to be offset by a possibility of higher returns. Investors who pick riskier assets ought to be compensated for the extra risk they take on. This rule, in turn, informs how to allocate assets or structure a portfolio, and can help determine long-term financial planning by making sure investment decisions are made within the context of acceptable risk.

- More risk, more return: Investors bear the downside only for an upside.

To take one example, stocks perform better than bonds in the long run owing to their greater risk and

uncertainty. This extra return compensates for the risk of price changes, economic shocks or swings in market sentiment and it is rational to favor them over safer assets when time permits.

- Lower Risk, Lower Expected Return: Products that are sold under the label of 'safe', such as government bonds or bank deposits, does provide stability and predictability but however at a lower return. Babysitting,..risk averse investors, retirees or other person who has.

short-term preferences typically select these, sacrificing upside in return for predictability and the safety of principal. This is the basic interchange of safety against growth.

- Time Horizon and Diversification: The more they can rely on outperformance from equities A longer time horizon will allow investors to live with underperformance, reduce risk in a portfolio by avoiding overconcentration in short-dated instruments.

volatility, whilst diversification across asset classes also hedges against the unsystematic risk and smoothes returns. Since different asset types move at different rates, this mitigates the portfolio's vulnerability to those shifts, while still enabling the opportunity for growth (reasonable growth and less overall stress though!

This trade-off evolves with the state of the economy. When there's a lot of political uncertainty, investors want more.

compensation and in normal market conditions accept lower risk premiums. Knowing this relationship allows investors to adapt their strategies accordingly.

### 6.1.2 Risk Premium: Definition and Significance

The **risk premium is the additional return an** investor desires **in exchange for** holding a risky security rather than the risk-free asset.

It links the risk– return trade-off to the real world, in pricing and selecting investments. Investors can then assess for themselves whether the potential reward is worth the risk.

- Risk Premium = Expected return on a risky asset (say the stock market) – risk free rate of return ( say that prevailing on Government bonds). As an example, let's say a stock is projected to deliver 10%

if the 10 year bond returned 4%, that additional 6% would be a risk premium, or compensation for the market not being guaranteed.

- Flavors of Risk Premiums: Market risk premiums reward the excess return for stocks over bonds; credit risk premiums pay you extra for lending to corporations instead of governments; and liquidity

premiums are what you pay for shit that no one will buy wholesale. Every one reflects a certain dimension of risk and helps investors make sense of why returns vary among asset classes.

- Drivers and Implications: Risk premiums increase or decrease when the economy improves or deteriorates, investor sentiment changes or asset characteristics deteriorate. Amid crises, premiums expand as investors demand higher payment; in peaceful times, they contract. Understanding them enable investors to time investment entries and exits, and to gauge the attractiveness of asset pricing.

And by examining risk premiums, investors gain insight not just into the potential returns but also how markets regard and value risk in evolving circumstances.

### 6.1.3 Expected Return and Required Rate of Return

The return required and the rate of return that is expected can be very useful for evaluating types of investments. The expected

return is the investor's prediction of where probabilities lead. The hurdle is the least acceptable return for a given risk. Taken together, they are supposed to help gauge whether an investment belongs in a portfolio.

- Expectation: It is also called expected return and it's the probability times every possible outcome. For instance, if an asset has a 60% chance of returning 8% and a 40% chance of returning 2%, the expected return is  $(0.6)(8\%) + (0.4)(-2\%) = 3 \text{ pts.}$

return is 5.6%. This projection helps setting a reference point for different investment choices and for projecting the performance of an actual portfolio.

- Hurdle Rate: This is the risk-free rate plus a risk premium, which is appropriate to the required rate of return .:

investment's risk level. It acts as a hurdle rate. If the expected return to an investment is less than this rate, then it will be refused; if greater, then possibly selected. This way it enforces a disciplined, risk-adjusted method to invest.

- Inflation and Taxes Both the desired and required returns need to be adjusted by inflation (for a real return) and taxes to reflect the true, after-tax return. Without the adjustments, investors stand to overestimate the value of future income flows and misallocate capital in a way that undercuts long-term objectives.

Consistent application of them allows investors to choose assets in which the risk is adequately rewarded.

#### 6.1.4 Rational Investment Assignment as a Function of Risk Preference

The foundation of wise investing is alignment of an investors' risk tolerance with suitable investments.

Risk attitude is the financial ability and psychological comfort level with investors' acceptance of losses.

volatility. It creates discipline and consistency so it is not a question of panic in the context of market stress.

- Risk Capacity vs. Risk Attitude: A combination of an investor's financial situation — income, assets, time horizon — that define how much volatility they can take and a willingness to accept risk. How much they actually want to handle is determined by their risk tolerance — emotional comfort. Balancing both ensures

portfolios not over or under true tolerance.

- Tactical Asset Allocation: An approach to investing that considers the relative value of asset classes and allocates assets to where they appear most attractively valued. Bonds, dividend-paying stocks may appeal to the conservative investor; equities and

higher-yielding, but more volatile, alternative investments.

- Conduct and Adjust Discipline: As market movements adjust weights, portfolios must rebalance periodically to maintain target allocations. Retirement, income variation, or life.

new objectives also make it worth reviewing risk tolerance. By incorporating these changes, investors can remain aligned to their goals regardless of how circumstances evolve.

The system avoids overreaction to temporal market noise and promotes the development of a longer horizon aimed at financial goals.

### 6.1.5 Role of Risk Premium in Asset Pricing Models (CAPM – Intro)

**3** **1** The Capital Asset Pricing Model The CAPM is a model that describes the relationship between risk and return, assuming that the expected return on an asset equals the risk-free rate plus some premium for bearing systematic risk. This model

creates an observable relationship between beta (systematic risk) and the return that investors require.

**4** • RFR (Risk-Free Rate): This is the rate of return on a risk-free investment, typically government securities. It is one of those theories so powerful because it reduces all asset pricing to the question of what can be earned without risk, giving a benchmark for adding in risk premiums.

• Beta as Risk Measure: Beta measures the relative variability of an asset's return, when compared with the market. A beta above 1 indicates more volatility than the market; below 1 indicates less. This enables investors to measure an asset's potential exposure to market swings and price it accordingly.

Market\_Risk\_Premium in CAPM -It is the extra return from market portfolio which investors expect.

over the risk-free rate. CAPM then scales up this premium by the asset's beta to arrive at the required return. This makes the risk-adjusted expected return of every asset equal to that on its systematic rate.

- How It Affects Investors and Companies: Investors put CAPM to use when evaluating whether a security is appropriately priced based on the level of risk it carries. Companies use it to calculate their cost of equity and appraise projects. This

risk and return on the market give motorists a line of sight for comparison.

By incorporating the risk premium straight into its equation, CAPM teaches us how markets pay investors for bearing systematic risk and through this payment dictate what they expect to earn from any asset.

## 6.2 Factors Affecting the Risk–Return Relationship

The relationship between risk and return does not work in isolation; it is influenced by various external and internal

factors. Each one changes how investors think about uncertainty, how markets price risk and what premium is needed for a given investment. Those are notes of (a) macroeconomic, and sometimes structural or even behavioral factors. By

Being aware of these factors, investors and financial planners can forecast alterations in the risk environment and modify portfolios so that a level-headed approach combined with growth potential is still there. In this part is analysed the five most propaganda 10 important!

risk return equation factors impacting the risk return equation.

### 6.2.1 Market Volatility and Economic Conditions

Market uncertainty and the status of the economy are crucial factors in determining risk–return relationship because they influence investors' perception of uncertainty and their pricing of risk. Returns are less predictable during times of high volatility or economic distress, and investors are likely to require a higher premium for risky assets.

Vice versa, stable periods cut uncertainty and squeeze risk premium hence risk taking seems to be more appealing.

- **Market Volatility Driving Premiums:** When prices of stocks gyrate sharply over short terms, investors see more risk of loss. uncertainty, so they need higher expected

comes back to make up for the strain and possible downside. For instance, during the 2008 worldwide financial meltdown, equity risk premiums spiked as the proclivity for investors to move into safe assets reshaped the entire market landscape.

- **Economic Cycles Business Conditions:** In expansion, corporate profits rise, unemployment falls and the consumer spends. This type of environment generally is conducive to higher asset prices and a reduced perception of risk. On the other end, in recessions defaults go up, profits shrink and

are caused by increasing risk aversion and therefore higher required returns. This ebb and flow impacts all the large asset categories, and requires investors to continuously rebalance and reset their risk exposures.

- **Effect of Global Events:** Geopolitical disputes, trade wars, pandemics or natural disasters may

disrupt financial markets suddenly. These shocks elevate the level of uncertainty and risk aversion, and hence the required return to hold risky assets. They're investors who keep a close eye on global trends and

know how these times influence volatility, and can make trades accordingly.

Market volatility and the state of the economy accordingly are significant macro forces that determine just how much in risk premiums investors need. They also intertwine with other elements like liquidity and sentiment,

amplifying or moderating their effects.

### 6.2.2 Time Horizon of Investment

The length of time an investment is held makes a big difference to how risk and return are perceived. The word LONG-TERM takes time to smooth out volatility, and by the end of the lengthening timeline you can expect to end up with something like "history" that seems easier than it was while it appeared on weeks' worth of trading screens in real time. Its the other way around: short-term trading increases volatility and makes any little volatility lethal (the only explanation is fundamental news).

- Longer Horizons Dampen Short-Term Lurches: Investors with time frames of decades can.

markets as they eventually return. For example, stocks can be volatile in a given year but outperform bonds over many decades. This

resilience enables a younger investor, or an institution with long-term goals, to take on more risk for potentially greater return.

- Shorter Horizons Require Stability: Investors who need their money soon can ill afford a

prolonged drawdown. Preservation of capital becomes a higher priority for them than pursuing growth.

As a result, retirees or companies with short-term obligations typically flock to the low-yielding safety of bonds, cash equivalents or stable value funds.

- Risk Tolerance and Time: Risk tolerance interacts with time.

allocation. The longer your time horizon, the more capacity for risk you have, and the larger a weight of portfolio in equities and growth assets you can take on. A shorter time horizon squeezes risk tolerance, driving the investor into safer holdings.

Portfolio planners apply this principle to the design of glide paths in retirement funds, which move automatically from equities to bonds as the investor gets older.

With a clear understanding of their time horizon, investors can choose assets that have return profiles that will help them meet their goals and be able to stomach the volatility associated with those shorter times.

### 6.2.3 Liquidity and Accessibility of Assets

Liquidity and accessibility is the measure of how fast and easy it is to liquidate an asset without losing too much value in the open market.

significantly affecting its price. The return premium investors charge for liquidity shrinks as an asset becomes more liquid. More generally, less liquid assets tend to have higher required returns to account for the cost and risk of losing access to capital.

- **Liquidity Premium Explained:** Assets that can't be sold quickly, or that you would have to accept a deep discount in order to sell (think private equity, infrastructure funds and some forms of real estate projects... why not just!?) pose liquidity. To attract investors,

such investments generally offer higher return. This additional compensation — the liquidity premium — accounts for the risk that an investor cannot exit when desired.

- **Level of Market Depth and Transparency:** Assets that are traded on deep markets (e.g., large stock exchanges) where prices and liquidity are transparent tends to be more liquid than assets traded in over-the-counter or in private markets. Robust markets with many buyers and sellers minimize bid-ask spreads, transaction costs, and price fluctuations.

Securities with thinner trading show wider asking, higher transaction costs, and thus must offer more to attract participants.

- **Access Limitations and Investor Planning:** Some investments may have lock-up periods, minimum investment requirements, or restrictions under regulations that limit access. For example, hedge funds may tie up your investment for a year to three years; retirement accounts might punish you for taking the money out too soon. Investors will have to consider these constraints when they decide whether the return is worth having less flexibility.

Both the anticipated return and full portfolio design are influenced by liquidity and accessibility. The average wise investor holds liquid reserves for contingencies along with illiquid investment to take advantage of long-term growth opportunities, and in this way receives liquidity premiums without losing financial flexibility.

#### 6.2.4 Inflation Expectations and Real Returns

The higher the inflation expectations, the lower the real returns that investors can realize. When inflation rises, the

purchasing power of fixed income streams deteriorates, urging investors to require higher nominal returns or rotate into assets more capable of retaining value. Similarly, when inflation remains steady, or is falling, lower nominal

returns can still be converted into satisfactory real returns.

- **Declining Purchasing Power in Fixed-Income Assets:** Fixed coupons or interest paid out are worth less as prices climb. For instance, a bond that pays 5% is worth much less when its interest payments are no longer able to buy anything when

inflation spikes from 2% to 6 percent. This risk causes investors to demand higher yields or invest in inflation-protected securities in order to preserve purchasing power.

- Predictable vs. Unpredictable inflation: The markets can price in anticipated rises in the cost of living, but unexpected surges have destabilizing effects on prices causing them to oscillate back and forth as they fail to stick at any one point. Sudden shifts in inflation

expectations cause an asset revaluation, risk premia to expand and portfolio composition to change.

Investors who pay attention to leading indicators like commodity prices or wage increases will be able to forecast such trends.

- Asset Allocation Changes in the Face of Inflation: Historically, when inflation runs hot, investors reallocate towards – real assets- commodities, real estate or equities which have significant pricing power. This

behavior arises from the motivation to maintain or increase real returns while nominal returns vary. Fixed-income weights are lowered towards inflation-linked or floating-rate securities.

Expectations of inflation, therefore, drive risk premium levels and the asset allocation decision to realise a required real return.

#### 6.2.5 Investor Behaviour and Sentiment

Investor Sentiment&Behavior: Investors can be a powerful force in the risk–return equation, albeit an invisible one. Even with firm fundamentals, markets can gyrate based on group psychology. Understanding this

dimension permits investors to anticipate and dampen the impact of irrational exuberance or extreme fear on their investment returns.

- Behavioral Biases and Risk Perception: Overconfidence, Peer pressure and Loss aversion bias investors in perceiving riskness and return. Overconfidence can generate concentrated bets, while herding

behavior can inflate bubbles. During downturns, panic selling is the result of loss aversion. And all of these behaviors affect how risk premiums are determined and assets are priced.

- Sentiment Indicators as Signals : Volatility indices (like the VIX), investor polls and fund flows provide signals on mood for the market. When investors are optimistic, risk premiums compress because investors require less return for the same level of risk. When premium is high, investors who are disciplined could use such an environment to look for good buying opportunities.

- Buffett-Style Long-Term Discipline as a Balancing Weigh: “Investors who are following their strategic allocations and

rebalancerebalance regularly dminish the influence of sentiment on their portfolios. This is what enables them to have a consistent risk–return profile and avoid the rampant buy-high/sell-low action that characterizes emotional participants.

Investor attitude and sentiment therefore exaggerates or reduces forces such as volatility, liquidity and inflation expectations. These forces can be harnessed with a clear eyed understanding of them and doing so improves that we must understand the better decision making)parenenhances portfolio resilience.

### “Activity: My Personal Risk–Return Analysis”

In this activity, each student will individually select one asset class or a single security (for example, a stock, bond, commodity, or index) and analyze how the five factors—market volatility, time horizon, liquidity, inflation expectations, and investor sentiment—have influenced its risk–return profile over

the past five years. The student will research historical data, identify key shifts or events that impacted the asset's returns and risk premiums, and then write a short report explaining how each factor altered the investment's attractiveness. This exercise develops the ability to independently apply theoretical concepts to real-world market conditions and deepens understanding of how macroeconomic and behavioral elements shape investment decisions.

### 6.3 Efficient vs Speculative Risk

Two types of risk associated with the investment are efficient risk and speculative risk. Effective risk means reasoned, productive and required uncertainty that has real value in assets beneath.

Speculative risk arises from the kind of excessive or gambling-type behaviour in which investors pursue returns without due consideration and/or without adequate risk control. Recognizing the difference can aid investors in deploying capital judiciously, pricing risk premiums competently, and steering clear of harmful speculation. It can also enable portfolio managers to create

profiles and for the risk assumed is justified by a reasonable expectation of reward.

#### 6.3.1 Definition of Efficient Risk (Investment Risk)

Efficient risk, or systematic risk, is the degree of uncertainty that is associated with upstanding, functioning and efficacious capital markets.

WHERE THE RISK IS TANGIBLE, COMPENSABLE AND LINKED TO REAL ECONOMIC ACTIVITY. This type of risk is inherent in the way markets work, in financing growth and realizing innovation. Investors accept

effective exposure, in exchange for commensurate returns.

In the efficient risk such as market volatility, interest rate changes, or sectoral characteristics produce variations in returns that can be analysed and replicated. Unlike speculation, efficient risk doesn't derive its energy from hype or fluff but rather from participation in actual value creation.

- **Quantifiable and Quantified:** Effective risk is one based on solid information — historical volatility, credit ratings or cash flow projections. This measure of risk is the one that investors can price into expected

returns. For instance, an equity portfolio comprises volatility but its risk are measureable and rewarded by an equity-risk premium.

- **Productive Economic Activity:** An Inflation Hedge Real estate is an investment in a productive economic activity, i.e. Investing in a business like -- it's a bet against inflation." or financing other commercial enterprises that add value to society and have the potential/incident of increased profits from said investments.

municipal bonds, or funding infrastructure projects all represent efficient risk. These exercises give capital to production, employment, and services — they tie risk to actual outcomes instead of speculative bubbles. This makes investors in this system co-bearers both of the potential returns and enterprise risk.

- **Proper Return Expectation:** Effective risk is associated with expected returns. Equity investors look for dividends and capital gains; bondholders look for interest. The uncertainty risk premium embedded in these instruments, therefore, serves to similarly align investor attitudes toward investing option fri.

incentives with economic reality.

What is efficient risk? Efficient risk means disciplined, analytic and justifiable view that ambiguity is the price of participation in a productive economic activity.

### 6.3.2. Definition of speculativerisk (gambling or excessive risk)

This unsystematic risk arises from unmeasured, hazardous or speculation oriented activities in which the chance of loss is high and compensation is not possible. Unlike efficient risk, speculative risk may entail the purchase or sale of securities at prices unrelated to intrinsic value, excessive use of leverage, or participation in herd behavior.

This sort of risk is characterized by asymmetry: small odds of a huge gain and large odds of a devastating loss. Rather than fund productive activity, risk of speculation often redistributes wealth among periods recipients and issuers.

participants in whom timing, and luck, trump'd analysis and value creation.

- **Uncalculated or Extremist:** Speculative risk does not consider the real situation of fundamentals. Investors can respond to hearsay, momentum, or the dream of quick bucks. When there is no pricing of risk, returns become unpredictable and it becomes possible to lose more than you put in, especially if leverage happens to be used aggressively.
- **Decouple from Underlying Value:** When it comes to being speculative, asset prices become more about people assuming that they can sell at higher price when there are no underlying fundamentals generating economic value. Classic examples include

historical bubbles where valuations were no longer grounded in reality, participants depended only on the "greater fool" theory of investing.

- **Extremely High Risk of Financial Attack:** Speculative risk is capable sacrificing cashiers into brief, short-lived financial windfalls that inevitability lead to an acute round-trip. Prices plummet as soon as the bubble bursts or the sentiment changes,

erasing gains and causing losses. This has a chilling effect on raising capital - and investors' confidence.

Understanding speculative risk helps investors realize that they have moved from calculated investing into a hazardous realm and creates an incentive to use protective measures or plan for escapes.

### 6.3.3 Measuring and Managing Efficient Risk

Effective risk can be measured and controlled with existing tools and techniques. Investors accommodate that risk by adjusting the level of their exposure to different risk factors and thereby ensure that all risks are rewarded with expected returns. This keeps themselves engaged with positive potentials and a downside risk that is manageable.

- Quantitative Measures: Standard deviation quantifies the overall volatility, beta indicates resistance to market movements, and Value at Risk (VaR) estimates the maximum potential loss over a specific timeframe. These

metrics turn uncertainty into quantities that can be measured and used to make decisions about which assets to select and how to compose a portfolio.

- Diversification and Asset Allocation: The allocation of investments throughout various sectors, geographic regions, and asset types can mitigate unsystematic risk and lessen volatility. Asset allocation strategies combine higher-risk, higher-return assets with stabilizing ones like bonds or cash equivalents to build custom-tailored portfolios for each investor's particular risk tolerance and goals.

- Financial Instruments for Hedging: The use of options, futures and swaps can be used to hedge the interest rate risk, currency (FX) exposure or underlying commodity price movement risk that is inherent in efficient investment vehicles.

The best aspect of hedging is that it provides a tool to turn uncertain exposures into manageable ones, you get to keep the good (the upside), while protecting yourself against the bad should circumstances change dramatically.

Continuous monitoring and stress testing: Risk is a dynamic phenomenon not a static one. Scenario analysis and stress testing allows investors to replicate how things might unfold, reveal any specific pressure points in a portfolio and/or come to logical opinions on re-allocating risk before the risks do crystallize. This alertness preserves the coherence of risk–return adjustment over time.

Effective risk measurement and management therefore involves a blend of data analysis, portfolio construct and continuous monitoring to match uncertainty with reward.

#### 6.3.4 Recognizing and Avoiding Speculative Bubbles

Speculative bubbles are when the price of an asset goes wildly above its intrinsic value, driven by hype, herd mentality or easy money. It's important to be able to identify and steer clear of these bubbles in order to retain capital. Investors who recognize the warning signs and stay disciplined can avoid catastrophic losses when bubbles pop.

- **Warning Signals of Bubbles:** Factors like fast, unsustainable price rises, frothy valuations, heavy borrowing and frenzied headlines frequently signal that speculation has left the fundamentals behind.

By tracking valuation measures like price-earnings ratios or growth in credit, one can spot distortions early.

- **Psychological Forces:** Fear of missing out (FOMO), the herd mentality, and overconfidence can drive investor herds to the bubble. Knowing these behavioral prompts allows for crowd CONTROLLED resistance.

pressures and keep an analytic discipline, even when a friend or the media is pitching up “can’t lose” opportunities.

- **Bubble Risk Controls:** Staying diversified, close to target allocations and rebalancing using valuations avoids overexposure to bubbles. Some

investors raise cash or rotate to defensive sectors to cut vulnerability while staying involved in wider markets.

- History Lesson: The dot-com bubble, housing crises and commodity booms showed how speculation can soar and sink. Analysing these episodes helps develop a mental filter with which to identify unsustainable trends, promoting doubt when facing “new paradigms” that do not make economic sense.

Steering clear of bubbles is not about perfect timing, it's about discipline, skepticism of extraordinary claims and sticking with value.

### 6.3.5 Risk Suitability for Different Investor Profiles

There are different risk tolerances for different types of investors. Suitability is determined by investment objectives, time horizon, and attitudes.

resources, and risk tolerance. By linking risk type to investor profile, the investment strategy maximises the chance that it will be maintainable and in tune with a person's psychological tolerance and economic requirements.

- Conservative Investors: Those who value wealth protection and stable cash flow. Advisory Those people would be ideal candidates for cost-effective risk, such as investment-grade bonds, blue-chip stocks and balanced funds.

Avoid the speculative risks, those which carry asymmetric payouts (that is to say can potentially eliminate years of retirement saving or deplete your emergency fund).

conservatives yet steadfastly efficiency minded. This may be in the form of growing stocks, mutual funds that are diversified or even real estate – but all with checks lever to ensure they aren't over-leveraging themselves to exposure of speculation at a minimum proportion of their portfolio.

portfolio.

- Aggressive Investors: These investors have high income and long time horizon, they also possess great-

tolerance for volatility. They might shift their investments from stocks to emerging markets or alternative assets.

But even the most aggressive investors should differentiate between efficient risk (rewarded) and speculative risk (potentially unrewarded) in order to avoid catastrophic loss.

- Institutional vs. Retail Investor Profiles: Pension funds, insurance companies and endowments are

subject to fiduciary duties and formal mandates which limit risky behavior. To the extent that retail investors are more subject to speculative temptations (e.g., due to behavioral biases or\*) This paper significantly benefited from discussions with Rui Albuquerque, Kerry Back, Zhi Da, Jacob Sagi, Vikas Agarwal, and seminar participants at INSEAD and the Yale School of Management.

experience. Understanding this distinction can serve to customize education and risk controls.

By matching risk to the investor profile, portfolios stay consistent and disciplined – accommodative whenever possible, but aggressive because it has to be; not because the investor is at peril.

### Knowledge Check 1

Choose the correct option:

1. . Efficient risk refers to:
  - a) Gambling behavior
  - b) Calculated investment risk
  - c) Random speculation
  - d) Unplanned leverage
  
2. Speculative risk usually involves:
  - a) Fundamental analysis
  - b) Diversification
  - c) Excessive leverage
  - d) Conservative investing
  
3. Which tool measures market sensitivity?
  - a) Sharpe ratio
  - b) Beta
  - c) Liquidity ratio
  - d) Credit score
  
4. A speculative bubble can often be recognized by:
  - a) Stable valuations
  - b) Limited media coverage
  - c) Rapid price increases
  - d) Low investor interest

5. Conservative investors are generally suited to:
- a) Speculative assets
  - b) High leverage
  - c) Efficient risk
  - d) Gambling strategies

#### 6.4 Practical Examples of Risk–Return Combinations

Various type-risk-return combinations patterns can help investors to experience different types of.

uncertainty and reward. Learning and Risk–Return Patterns <sup>2</sup> Connect the dots between large and small sizes AND low Book/Market (i.e. distress) based on CompuSTAT data POINTS This combination of size and distress provides a conceptual basis for a value premium Understanding these combinations gives investors an empirical sense of how the risk–return tradeoff operates across multiple dimensions 38

return trade-off works in practice. We can then examine **high-risk/high-return; medium-risk/moderate- return** and **low- risk/low-return** investments to the observe how those same principles of risk premium, diversification and market.

accessibility are applicable to all asset classes and investor types.

##### 6.4.1 High-Risk/High-Return: Equity, Cryptocurrency, Startups

High-risk/high-return investments represents the most risk-tolerant end of the risk–return spectrum. They come with a high risk of loss — and the possibility of spectacular gains. It's also a best fit for these investments

long-term investors, a high risk tolerance [72], and financial strength. Investors, when taking on added uncertainty, demand compensation in the form of higher returns — but they also must accept that what plays out can vary widely. The appeal of high-risk/high-return investment is that it can Create

rich quick when you win, but it takes skill, diversification and discipline to manage well.

- Equities as Growth Engines:

Equities represent a share of ownership in the issuing company and offer the potential for capital appreciation and dividends. Shares of emerging-markets or highgrowth companies in areas like tech, biotech or

renewable energy can offer high above-average returns. But those gains come with the risk of big losses from market cycles, regulation or disruptive competition.

Tesla, for instance, surged from about \$80 in 2019 to over \$400 (split-adjusted) by 2021 during feverish investor exuberance only to tumble dramatically as the markets corrected and interest rates rose. A third straightforward example is a small Indian IT stock that has doubled, say during some tech boom; but

falling by half in a slowdown.

- Cryptocurrencies as Volatile Assets:

Digital coins, such as Bitcoin or Ethereum, have seen high levels of volatility over limited timescales.

These swings are driven by speculative interest, tech adoption, security breaches and regulatory developments. There were early adopters who bought Bitcoin at \$500, which went on to peak above \$60,000

but also fall to \$20,000 within months. There is no inherent cash flow, which makes the valuation challenging and the risk higher.

For instance, a student who purchases a cryptocurrency token at \$1 may see it zoom to \$5 rapidly, but also face the potential of watching it crash back down to 50 cents if hype wanes.

- Startups and Private Ventures:

The investments in startups are not a matter of clear “pricing” and no one is really sure if the business model will ever work. This can lead to huge gains if the company does well, but it’s also very easy to fail. Airbnb’s early investors made a killing when the company went public, for example, but for every Airbnb there are many more startups that fail.

Example is a small local food delivery app: when it scales regionally it can turn into 10x, else fail and make investors lose their money.

The hot investments that have the potential to return high also should make up only a limited percentage of an overall portfolio. A young saver with a secure job may wish to invest 15–20% of their savings in these opportunities and keep the remainder in low or moderately risky assets. This avoids sex They avoid over-indebtedness and becoming slaves of banks like the rest of us.

financial security.

To handle such investments with care, they need to:

- Diversify across sectors and types of assets to prevent any single failure from being catastrophic.
- Do your homework: research the market, leadership and fundamentals.

- Stick with the emergency fund and safe base to ground produce in a portfolio during down times.

Once supplemented with a cold-eyed acceptance of risk and volatility, high-risk/high-return investments can be useful, strategically–attuned to the challenges of growing wealth over time, but coolly aware that aggressive growth plays in risky markets is inherently very uncertain.

#### 6.4.2 Medium-Risk/Moderate-Return: Mutual Funds, Balanced Portfolios

Medium-risk/moderate-return investments are in the middle of this spectrum, and they offer moderate risks for moderate returns.

bonds. They are appealing to investors who want growth beyond what inflation provides, only they don't want the wild price swings that come with speculative assets. Through a mix of asset classes, these investments tamp down volatility and realize steadier

returns over time. The mutual fund is an example of this approach. They are particularly suited

to mid-career savers, parents with educational priorities and average length investors seeking a combination of capital appreciation and capital protection.

These investments reflect the fact that most investors are of two minds: They want to grow their assets, but they also don't want to be thrown into a panic in a bear market.

By spreading money across equities and fixed income, or through diversified products, moderate-risk investments are designed to deliver inflation-beating returns and guard against massive drawdowns.

- Diversified Mutual Funds:

Mutual funds that are diversified buy a variety of different securities from a wide range of sectors and asset classes with the money it pools from investors. Through purchasing dozens or hundreds of stocks and bonds un-systematic risk is effectively mitigated.

A case in point: A large-cap index fund linked with either the S&P 500 or Nifty 50 provides exposure to leading

companies, mitigating individual-company volatility. Active management takes it a step further by choosing securities based on research, which may outdo benchmarks. In India, diversified

Then there are equity funds such as HDFC Equity Fund or ICICI Prudential Bluechip Fund, which spread the investment in multiple sectors and hence cushion from a single company's poor show.

- Moderate Risk Portfolios with Combination of Investment Tools and Asset Classes:

In a typical balanced portfolio, 60% might go to stocks and 40% to bonds. This mix combines growth from stocks with income and stability from bonds. In market downturns, the bond portion can be a cushion that dampens equity losses. So in 2020, when global stock markets tumbled at the outbreak of the pandemic, U.S. Treasury bonds rallied and helped balanced portfolios check losses vs. their all-equity peers. Balanced funds like Vanguard Balanced Index Fund or HDFC Hybrid Equity Fund do all this balancing for you at a ready-made moderate-risk solution.

- Systematic Rebalancing to Stay at Target Risk:

Hence, Medium-risk strategies need to be periodically rebalanced in order to maintain an even balance of risk. If stocks outperform and rise to make up 70 percent of a portfolio, for example, an investor sells some stock and buys bonds to restore the mix to 60/40. This technique avoids creeping risk and captures profits from appreciated assets. For

ex, a balanced fund could automatically rebalance on a quarterly basis to prevent investors from investing in or redeeming an amount that needed to be invested into their underlying funds.

inadvertently glide into a bullish allocation after a bull market. Rebalancing also gets you to do the “buy low, sell high” thing by selling a little of your overvalued assets and buying more undervalued ones.

- Hybrid Funds and Target-Date Funds:

Many investors now select hybrid, or target-date, funds, which automatically shift their holdings based on a target retirement year. This money begins more aggressive and slowly becomes less so as you near retirement.

more conservative as head into retirement through systematic adjustment of the portfolio. By way of example, a target-date fund for someone retiring in 2040 might start out as 85% equities and 15% bonds and end up as 50% equities and 50% bonds by the time that year rolls around.

- Examples of Real Outcomes:

Over the long haul, a 60/40 equity-bond portfolio has produced an annualized return of roughly 7–8% (vs. 9–10% for an all-equity portfolio) with much less volatility. This makes

medium-risk investments appealing to investors who require growth but can't stomach large drawdowns.

In India, too the returns from balanced advantage funds have yielded factors akin to their peers leaving investors with more stable returns versus pure equity during volatile times.

Medium-risk/moderate-return investments, they're a convenient illustration of the equation between risk and return. They also permit investors to share in economic growth while

mitigating the risk of suffering crippling losses. That balance encourages investors to stick to their long-term plans and avoid the emotional excesses of chasing hot markets or fleeing during downturns.

#### 6.4.3 Low-Risk/Low-Return: Fixed Deposits, Bonds

At the low risk, low return end of the risk-return spectrum are investments in low-risk/low-reward. They are Capital preservation and steady income focused more than growth-oriented. These

instruments are particularly valuable in financial planning because they serve as a stabilizing force when part of a diversified portfolio. They are for retirees, risk-averse savers or anyone with short-term financial obligations who can't afford to lose their principal. Safe assets give confidence, predictability, stable cash flows as well as growth and excitement!"

liquidity, and so they should offer lower returns than equities or other risky assets due to less risk in the form of uncertainty.

These investments are made for three primary reasons—preserve capital, generate regular income and offset the risk of other high-volatility assets in a portfolio. Because they are not as exposed to ups and downs, they help investors keep a level head when panic selling occurs.

- Fixed Deposits for Guaranteed Returns:

FDs give you a fixed interest rate for a certain tenure. They are generally backed by banks or insured financial institutions and are considered very safe. For instance, an one year FD may get you 5% return per annum, but a five-year FD may provide a slightly higher interest rate of 6%. In India, bank FDs

are covered under the Deposit Insurance and Credit Guarantee Corporation (DICGC) up to a certain extent. Here in the U.S. CDs function the same way under FDIC insurance. This certainty of

payouts make FDs a great option for the contingency fund, short-term savings goals or even for parking excess cash temporarily.

- Government Bonds for Safety:

Government securities (say U.S. Treasuries-U.K Gilts-Indian G-Secs) are nearly considered risk free since government has the power to tax or print money in order to fulfill those obligations. They provide regular

6 pay interest every six months, and repay principal at maturity. For instance, a 10-year U.S. Treasury could have a yield of 4%, while a 10-year corporate bond could have a yield of 7%. Investors take the lower yield due to almost no default risk. In India retail investors can buy G-Sec using the platform RBI Retail Direct. They're also highly liquid, traded actively in secondary markets, and therefore available to be sold quickly if cash is required.

- High-Quality Corporate Bonds:

Besides government bonds, investment-grade corporate shares should also belong to the low-risk sector for strong companies. They do however come with a bit more risk than

government bonds, the kouis typically pay out a higher yield. For example, a AAA-rated corporate bond in India may be offering 6.5% compared to 6% on a government bond which compensates the investor for taking on some form of institution-specific risk.

small but measurable credit risk. They have proved popular with the institutional investors that would be natural buyers, including insurance companies and pension funds, given their predictable cash flows.

- Liquidity and Predictability:

Low-risk instruments are often easily liquidated, making them suitable for emergency funds and orElse → If you're not sure whether or'=>\$this->authuser("will"?)

for future needs such as tuition payments or a house down payment. This liquidity helps investors feel confident they can meet outflows without having to sell volatile assets at a loss. Their regular payments — in the form of interest or set maturity amounts — make budgeting and financial planning easier. For instance, a retiree can ladder fixed deposits or bonds in order to receive regular income over the span of several years while having cash on hand and earning more than with a simple saving period.

- Role in a Diversified Portfolio:

Low risk assets serve as ballast, dampening portfolio volatility and providing peace of mind. In times like this, fixed income (bonds/FDs), for example, can be flat or appreciate during an equities sell-off. For example, during the 2008 global financial crisis in response to a weakness in most other core asset classes (including Developed Market equities and commodities), U.S. Treasury bonds rallied.

tumbled, bolstering more diversified portfolios through the storm. Investors who retain a portion of their wealth in low-risk assets can rebalance back into equities when they are cheap, benefiting from price cycles.

Low-risk/low-return investments are those that offer very minimal risk (such as certain types of money market funds, U.S. Treasury bills and short-term deposit accounts) but also have a lower return than other higher-risk investment vehicles.

- Bank FD (Foreign country)/ CDs (if NRI in USA).
- U.S. Treasury Bonds, U.K. Gilts and Indian G-Secs
- Post Office Savings Schemes (India)

- Short-duration Investment-Grade Bond Funds
- Laddered Bond Portfolios To Match Future Liabilities

These are illustrations of the idea that there is not just one category of low-risk investment, but rather a toolkit investors can mix and match. The consistent factor: stability, liquidity and modest yield, three of which are critical for conservative savers or retirees—and an anchor in most diversified portfolios.

#### Matching the Type of Investment to Investor Profile 6.4.4

As asset type is matched with the investor profile, so are the risk and return characteristics of the investment fit an investor's objectives, resources and a comfort level for volatility. This ensures the portfolio remains

sustainable, and manages to avoid panicking during downturns. It's a moving target, which changes with life circumstances.

**Conservatives:** People who can't afford to take risks, the chronically underfunded, or those with little time left

horizons. Investible options are FD, Bonds, Balanced Funds and Dividend paying blue chips. They value preserving capital and regular income, not rapid growth.

**Moderate Investors:** This type of investor would seek for diversified mutual funds, balanced ETF's or even more a balance between equities and fixed income. They're willing to tolerate some volatility for a chance at higher long-term returns, but they still tread carefully with speculative assets.

**Aggressive Investors** - Those who have high incomes, long time horizons and would be able to withstand volatility can take greater exposures to equities, startups or cryptocurrencies. Yet, even they rely on diversification, risk sizing and hedges to prevent catastrophic loss.

Time-Based Rebalancing Over time, as an investor gets older or his goals change (retirement, education, business funding), the risk profile should be adjusted. This could involve slowly shifting from equities to bonds, or to proportions of both; and gradually reducing the proportion in other asset classes like emerging markets and foreign stocks.

risky investments to less volatile income sources.

#### Did You Know?

“Many countries’ securities regulators require financial advisors to perform a risk profiling exercise before recommending products. This ensures that investment advice is suitable for the client’s risk appetite and financial capacity, reducing mis-selling and protecting investors from inappropriate exposure to high-risk products.”

#### 6.4.5 Portfolio-Level Risk–Return Strategy

Portfolio-level risk–return strategy is the combination of all these things to achieve as an integrated whole. It’s not about

specific assets, but on the way in which the total risk and return is created by all the assets. Investors reach better results when they select investments as a system rather than an individual.

Strategic Asset Allocation to Establish the Blueprint: Investors determine their long-run exposure to equities, bonds and alternatives consistent with their risk tolerance. For example, a young investor may have an 80% position in stocks, with only 20% in bonds whereas a retiree may reverse the ratio. This allocation is what defines the portfolio’s baseline risk.

1) Low-correlated Diversification: Mixing assets that don't move in lock step smooths performance. For example, when stock markets fall, high-quality bonds or gold can increase,

cushioning losses and maintaining liquidity. This effect of correlation is the basis for risk reduction at the portfolio level.

Regular Evaluation and Rebalancing: As market shifts cause allocations to deviate, routine

rebalancing restores the original mix. This helps prevent risk creep from dominating the portfolio and ensures it remains on track with the investor's original plan. Applying metrics like portfolio beta, standard deviation and drawdown analysis

helps track evolving risk.

Adding Alternatives and Defensive Assets: Less liquid asset classes such as real estate, commodities or hedge-oriented strategies can provide another layer of diversification against risk. If the facts eventually reveal that fears of a virus-driven economic slump were overblown, but markets react beforehand — again, which is what always happens — then defensive assets like cash or very short-term bonds serve as a shock absorber, allowing the investor to weather volatility and perhaps even play offense in stressed-out markets.

At the portfolio level, with strategy it's not so much about picking winners, as it is in constructing a robust investment ecosystem that has been organized to its goals. By pressing value and momentum sources of return into service, investors can benefit from an efficient form of risk taking without venturing too far out on the speculative or concentrated limb.

## 6.5 Summary

☐ The concept of risk– return trade-off is the foundation of every investment selection; it demands greater returns in exchange for increased risks.

☐ Efficient risk is undertaken through measured and quantifiable consideration with productive economic implications; speculative risk amounts to little more than the gamble of not enough homework being done.

- ☐ Diversification helps spread risk in different asset classes, and help reduce the non-systematic exposure and stabilize returns.
  
- ☐ Risk premiums reward investors for holding risk above the risk free rate and are time varying across marketstates.
  
- ☐ High-risk/high-return assets, such as stock market shares, cryptocurrencies and start-ups may offer a tremendous return but also very large losses.
  
- ☐ Medium-risk/moderate-return investments, such as mutual funds and balanced portfolios, provide both growth and stability.
  
- ☐ Assets with lower risk and returns such as fixed deposits and bonds focus more on preserving capital and earning a stable income than receiving immediate growth.
  
- ☐ Selecting investment types appropriate for investor profiles help to provide suitability by matching risk tolerance, time horizon and goals.
  
- ☐ Portfolio-level strategies include asset allocation, diversification, and rebalancing to reduce risk and maximize return.
  
- ☐ Knowledge of market volatility, liquidity, inflation expectations and investor sentiment can facilitate forecasting of the risk-return trade-off.
  
- ☐ Risk mitigation mechanisms, including hedging, monitoring and rebalancing: The above will promote long-term stability and reduce the risk of catastrophic losses.
  
- ☐ Rational investment decisions are based on a healthy balance of quantitative analysis and behavioral discipline that allows investors to ignore natural speculation and focus on organic growth.

## 6.6 Key Terms

**Risk–return Trade-off:** The concept that increased risk should result in an increased chance of higher return.

**Operational Risk:** Controllable risk resulting from sound productive investments — is measurable and calculable.

**Speculation:** Risk that is overly-risky or gambling sort of risk with insufficient analysis and value behind.

**Risk Premium:** The additional return above the risk-free rate that investors require in order to hold a risky asset.

**Diversification:** The practice of spreading an investment over various assets in order to lower potential risk due to any one source.

**Beta:** A measure of how an asset's returns fluctuate in relation to the market as a whole.

**Rebalancing:** Bringing a portfolio back in line with its target asset allocation.

**Liquidity Premium:** That extra return required for holding assets that are less easy to sell quickly.

**Balanced Portfolio:** A combination of stocks and fixed-income securities for moderate risk and return.

**Fixed Deposit:** A type of bank savings product that pays you a fixed amount of interest if you keep your money in it for an agreed time period.

Venture Capital: Investment in a start-up or early stage company offering significant growth potential and significant risk.

Investor Profile: A risk tolerance, time frame and goal amalgamation that helps build the appropriate portfolio for a person.

## 6.7 Descriptive Questions

Distinguish between efficient and speculative risk by giving examples from life .

Explain how diversification can affect the risk–return characteristics of a portfolio.

Explain the method risk premiums are calculated and its implications to investors.

Discuss the influence of time horizon on an investor’s risk–return relationship.

Assess high-risk high-return assets, such as shares, cryptocurrencies and startups from a portfolio construction perspective.

Discuss how mutual funds and balanced portfolios are examples of medium-risk/moderate-return investments.

Explain the relationship between matching types of investments to clients and what analogy and/or problem can be drawn?

How can risk-return strategies at a portfolio level help achieve long-term investment objectives?

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### Knowledge Check 1

1. b) Calculated investment risk
2. c) Excessive leverage
3. b) Beta
4. c) Rapid price increases
5. c) Efficient risk

## 6.9 Case Study

### Background:

Rajesh, a 35-year-old midcareer professional, is earning a steady income and has built up savings which he is keen to invest. His goals are to save for his children's education in 10 years and early

retirement in 20 years. Till now, Rajesh was only into fixed deposits and was getting a low rate of return.

barely above inflation. And he knows this strategy can't make him the new richest man in town, and wants to diversify his portfolio. He's heard of equities, mutual funds and cryptocurrencies but doesn't know how to balance the risk and return.

### Narrative:

Rajesh's story is that of many investors struggling to make the transition from low risk/low return investments, to a balanced investment approach. He wants to beat inflation and make money but

can't afford to lose much of his life savings in a market downturn. He's got to learn the difference between efficient and speculative risks, risk premiums, and how diversification plays a role in constructing a resilient portfolio.

Rajesh meets a financial planner who takes him through the risk profiling exercise. They establish his moderate risk profile and medium to long-term investment time frame. According to this, the counselor suggests that one should diversify and invest in high-risk, medium risk, and low-risk investments. Additionally, the adviser teaches Rajesh about Systematic Rebalancing and Behavioral Discipline so that he doesn't panic if his investments are down one year due to a downturn in the stock market.

### Problem #1: Over-allocation to fixed deposits and low real returns

- Solution: Move from 100% in fixed deposits to, say, 40%, and balance funds / mutual funds. For instance Rajesh can invest 30% in diversified equity mutual funds and another 30% in balanced hybrid funds and keep the remaining 40% in fixed deposits for .

safety and liquidity. This type of strategy helps add to return potential while keeping stability..

### Problem Statement 2: Interest in Cryptocurrencies and High Risk Assets

- The Solution: Limit high-risk/high-reward investments to a small portion—say 5–10%—of the investment portfolio.

return assets, such as cryptocurrencies or equities from emerging markets. Rajesh should treat this as a

satellite allocation, not a core holding; dollar-cost averaging can minimize timing risk." This gives you the opportunity to benefit from potential high rewards, while keeping the majority of his savings in reserve.

### Problem 3: Ignorance on Rebalancing and Monitoring

- Solution: Adopt a once-a-year rebalancing strategy. If the equities outperform and grow to be over the target share, sell extra equities and reinvest into fixed deposits or bonds to get back within useDispatch(restoreMilestones(R,r), cash) = value that is lower than despatch M by an amount  $r \cdot km$ .

balance. This is to avoid creeping risk, and to impose some discipline, as well as locking in profits. Rajesh can turn to automated investment platforms, or regular check-ins with his adviser.

### Reflective Questions:

What is the role of Rajesh's time horizon in his newfound capacity to afford more risk relative to when he was invested entirely in fixed deposits?

What parts of Rajesh's new portfolio are efficient risk and what part is speculative risk?

Explain how Rajesh is protected from market swings by an asset class diversified portfolio?

How does rebalancing help stop emotional or impulsive investment decisions?

How should his portfolio adjust if Rajesh's income changes or he revises his goals in five years?

### Conclusion:

These examples show how an investor can progress from Very low risk (low expected return) to a balanced portfolio that includes some of the efficient and speculative risks in appropriate proportions. By

Then, taking into account the risk premiums, diversification and asset allocation basics, Rajesh crafts a long-term investment strategy that is based on his objectives and tolerance for risk. The exercise shows the

value of knowing your investor type, aligning investments accordingly and staying disciplined with rebalancing. In the end, the case underscores the theme of risk–return trade-off: that it is not about getting rid of risk but about rationally managing it to get long-term

objectives.

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## Unit 7 Risk–Return Measurement Tools

### Learning Objectives

1. Understand the fundamental concepts of risk and return in the context of investment decision-making.
2. Identify and describe key risk–return measurement tools such as standard deviation, beta, and Sharpe ratio.
3. Analyze how different investment instruments vary in their risk and return characteristics using quantitative measures.
4. Evaluate the relationship between risk and expected return through the Capital Asset Pricing Model (CAPM).
5. Apply risk–return tools to assess the performance of individual securities and diversified portfolios.
6. Interpret the significance of risk-adjusted return metrics for investment performance evaluation.
7. Develop the ability to compare investment alternatives using statistical measures of risk and return.
8. Critically assess the limitations and assumptions underlying commonly used risk–return measurement tools.

### Content

- 7.0 Introductory Caselet
- 7.1 Holding Period Return (HPR)
- 7.2 Expected Return on Investment
- 7.3 Standard Deviation as a Risk Measure
- 7.4 Limitations of Traditional Metrics
- 7.5 Summary
- 7.6 Key Terms

7.7 Descriptive Questions

7.8 References

7.9 Case Study

## 7.0 Introductory Caselet

### Background:

Zenith Investments is an expanding Investment Advisory Company based on high net worth, institutional and retail clients with different risk appetite. "As the market has become more volatile in recent years, we wanted to create a new fund that was attractive to clients seeking moderate risk and long-term, stable growth," said Rene Desteghe, CEO of iM.

In reaction, Zenith introduced its mixed-type fund named Zenith Balanced Growth Fund (ZBGF) which invested 60 percent of the fund assets in equities and 40 percent in fixed interest. The equity portion was concentrated on blue-chip shares with steady dividends, and the fixed-income section primarily invested in high-quality bonds issued by companies and governments.

### Performance and Concerns:

In ZBGF's first full fiscal year, it returned 12%. At least on the surface, that would make you feel like this trade resulted in success compared to a return of 10% for the benchmark index. Contract base fee structures aren't necessarily a negative, but scrutiny of risk-return metrics revealed some causes for concern.

The fund's 15% standard deviation meant it had pretty high volatility, and its beta of 1.3 showed that it was more sensitive to the movement of the market than the overall market itself. Although the absolute value of returns exceeded that of the benchmark, ZBGF's 0.6

Sharpe ratio (compared with the benchmark's 0.9) indicated that ZBGF had generated fewer returns per unit of risk than the benchmark.

Clients and internal constituents started to have different opinions." Some said the higher return made it worth taking on the risk; others asked whether the fund actually deserved to be called "balanced," as marketed. Additionally, there were arguments over what role market timing, stock selection or diversification of portfolio played in making the risk so surprising.

Internal Discussion:

"If it's not something that we want to talk about of share in a strategy meeting where we're talking among 4-5 people, then it's not worth publishing.

"We have to go beyond raw return. If our clients have a roller-coaster ride in terms of the swings in value of their investments, especially through downturns, the psychological cost of that risk can overwhelm any statistical benefit."

Meanwhile, the marketers behind the effort defended their decisions:

"We delivered strong returns. In a place where clients are performance hunting, risk becomes meaningless next to results. We just need to say it in a way that resonates."

Management made the decision to perform a complete risk-adjusted performance review of ZBGF, instead, with metrics such as: Treynor Ratio Jensen's Alpha Sortino Ratio To determine the actual performance and alignment of risk within this fund.

Critical Thinking Question:

Does this give ZBGF the right risk/reward balance for its target investors, based on what the fund is trying to do and how it will be assessed? How could you incorporate additional risk-adjusted measures (e.g., Jensen's Alpha, Treynor Ratio, Sortino Ratio) to make a much better

assessment of the fund performance? How would such findings impact investment advice and client communication?

### 7.1 Holding Period Return (HPR)

Holding Period Return (HPR) Holding period return is a financial calculation to measure a total return on an investment over the time it has been held. Such a return includes both capital gains or losses and income, if any, including interest payments and dividends. You don't have to make assumptions about reinvestment of proceeds and timing of cashflows."Unlike some more complex return calculations, HPR is simple. This is especially helpful for the individual and portfolio managers who want a very quick way of measuring performance. HPR can be applied to all kinds of investment, such as stocks, bonds, real estate or mutual funds.

The significance of HPR is its capacity to provide a picture of profitability at any investment asset or portfolio. It gives an investor a view of how much he (or she) has made on that amount of capital, or how much lost for gauging their strategic and tactical investment decisions. This figure incorporates both income and capital appreciation, so it is considered to be a more complete view of return than price appreciation alone.

While easy to calculate, HPR is not time standardized. For example, a 15% HPR could be the return over one month or two years, and comparisons may not be fair if the investment durations are not identical unless we know that we are comparing annual returns. Moreover, in contrast to HPR there is no place for compounding returns or risk dimensions such as volatility. Nevertheless, it is a basic measure, which can use as a benchmark to derive the more sophisticated performance measures.

- Snapshot Performance Measure: HPR is a simple measurement for profitability of investment over a defined time. There is no need to correct for time value or compounding, so it is a simple first level analysis tool.

HPR is widely utilized by investors to compare two or more investments, or assess the past performance of a security. In practice, for professional portfolio management, HPR can be useful in performance attribution — determining whether gains in a diversified portfolio are dominated by some assets more than others. Although HPR is not all we need to make final investment decisions, it is an irreplaceable benchmark for return analysis.

### 7.1.1 Definition and Purpose of HPR

**Holding Period Return** is the total return over a given period provided by an investment as a percentage of an initial cost. Both the difference in price (capital gain or loss) and any income received over the holding period are included in the return.

The mathematical equation used to calculate HPR is:

$$\text{HPR} = (P_e - P_s + D) \div P_s$$

Where:

- $P_e$  = Final price or value of the investment
- $P_s$  = Price at which investment is purchased or initially bought
- $D$  = Distributions/ Income (i.e., dividends, interest) received during the Period.

This formula includes both capital appreciation and any types of income again the return calculation. And it is one of the few good performance measures that can easily be used without either software or complicated models-suitable for individual investors, financial analysts and students just starting to learn about finance.

- Comprehensive Return Measure: HPR account for both income and capital gains/loss; therefore, they represent a comprehensive perspective of return rather than just this from price appreciation.

The reason to use HPR is more than just a measurement. It enables investors to determine if their return expectations were realized, to compare the performance of assets held over differing time periods and thus decide about moving capital to better performing investments.

For example, when two stocks have same HPR but different levels of risk or time frame, then more analysis may be required in order to narrow down the investment.

There is however a shortcoming of HPR in that it fails to consider when the return was earned, hence we often calculate annualized or time weighted returns. However, under conditions where the investment is not being held for the same amount of time or when you are interested in absolute performance observation, HPR still thrives.

- Easy to Use: HPR is intuitive, it yields insights about an investment's performance for a specified period of time easily understandable with least amount of information.

Another important usage of HPR is to measure performance over certain time periods for reporting purposes. HPR may be used by investors to look at HPR over different time periods and compare with benchmark returns, identify under-performing securities or evaluate the impact of market events on portfolio returns.

### 7.1.2 Formula for HPR and Components

The HPR is obtained by dividing the quantum of gain on investment with the amount of initial value invested. Gain is the sum of all capital gains (or losses) plus any income received during the period that the asset was held. The standardized formula is:

$$\text{HPR} = (P_e - P_s + D) \div P_s$$

To put it another way:

$P_s$ — Initial Price or the price which is to be bought.

This is the price at which the investment was purchased. It serves as the denominator and serves as the base number for gains or losses.

$P_e$  > Ending Price or Sale Price

2 This is the asset value at the end of the holding period. The difference of the final and opening price is called capital appreciation or depreciation.

D – Income Received

This encompasses all income realized in the form of cash and receivables during the holding period, including dividends, interest, rents or coupon payments or other forms.

- Cash Flows Included: The HPR formula takes into account all the cash flows provided by the investment over time, so it provides you with a more holistic performance reading than just that simple price change.

An example is illustrative here : Imagine a buyer of a stock which he buys at 100, receives dividends at time t and sells the stock in exchange for \$x stands to make (s - x) if the market value falls below 100.

\$110. The HPR is:

$$\text{HPR} = (110 - 100 + 5) \div 100 = 15 \div 100 = .15 \text{ or } 15\%$$

It is then reported as the total return of holding on to stock, i.e., having interest and capital gain.

Some versions of the HPR formula would disregard income if not earned by the asset (e.g., non-dividend-paying stocks). But for the majority of investment analysis, you simply must include income to avoid underinvestment — and an understatement of performance.

- Not Time-Adjusted: Despite its benefits, HPR cannot consider the time value. Thus it is not same to have 15% HPR in both one year term and five year period.

It is also worth mentioning that the HPR formula we have just discussed is used in a nominal sense—that is, it does not account for inflation or taxes unless specified otherwise. For a more realistic view of actual investment return, you need to account for these.

### 7.1.3 HPR for Single and Multiple Periods

HPR may be computed over any time period. In the single-period scenario, computation is simple and direct. For example, if an investor purchases a bond at \$950, sells it at \$1,000 and collects \$30 in interest, the HPR is:

$$\text{HPR} := (1000 - 950 + 30) \div 950 = 80 \div 950 \approx .0842.$$

But if you hold an asset over multiple periods (say, a few years or a couple quarters), that calculation gets curly based on compounding. Crucially for such strategies, returns need to be composite compounded - that is added together, but squared. This is referred to as cumulative HPR and calculated as follows: [Errno 2] No such file or directory follows:.

$$\text{HPR Cumulative} = (1 + R_1) \times (1 + R_2) \times (1 + R_3) \times \dots \times (1 + R_n) - 1$$

Where:

$R_1, R_2, \dots, R_n$  are the HPRs of each single period.

For example, if a stock returns 10% in Year 1, 5% in Year 2 and -3% in year three the cumulative HPR would be:.

$$1.10 \times 1.05 \times 0.97 - 1 = 1.11915 - 1 \approx 11.92\%$$

The Math Matters When  $B > 0$ : Adding period-by-period returns willy-nilly can be very, very deceptive. Compounding is a closer to the truth representation of how an investment grows over time.

Time-weighted and dollar-weighted versions of the multiple-period HPR are also known. Time-weighted return is helpful for evaluating the skills of fund managers, because this measure eliminates the effect of external cash flows. Dollar-weighted return (or IRR) for example considers both the timing and size of contributions and withdrawals, resulting in a personalized figure.

- **Accruals HPR Reflects True Growth:** Because each period's return is compounded, accruals HPR demonstrates how an investment grows over time, accounting for the exponential effect of reinvested gains.

### Did You Know?

"The cumulative HPR over multiple periods must account for compounding, as simply adding returns across periods can distort actual performance. For example, two 10% gains in consecutive years do not yield a 20% return, but rather a compounded 21% return."

#### 7.1.4 Interpretation of HPR Values

Hpr holding period return is more than a number to calculate. It takes a little bit of interpretation of the investment landscape, knowledge of how long you want to hold and what your goals are. A positive HPR indicates an investment gain, while a negative HPR signifies a loss. But the percentage itself needs to be tested when compared with the competition, something else an AIP owner can earn on their capital, and then subject to the risk inherent in a given asset.

For example a 12% HPR might appear to be attractive. But if the benchmark index has risen 18% during the same period, then in fact, you've underperformed the market. Similarly, a 6% HPR in a bear market of -10% overall is good relative performance.

- **Contextual Performance Learning:** Understanding HPR is not sufficient<sup>830</sup> when taken out of context (Figure 1). It deliver a better perspective of performance, particularly in dynamic market circumstances when you benchmarking it against your own market or peer sets.

A second-important consideration is the length of the investment's holding period. HPR does not tell us how long it took to get that return. For instance, an HPR of 15% over a one-year period is quite different from it when measured in five years. Without normalizing time, the rate of return does not reflect the efficiency of an investment. This is where annualized return, for example becomes critical.

Investor should also consider the risk-adjusted performance. A high HPR from highly volatile assets may not be desirable than a relatively lower HPR resulting from stable low risk investments. Risk-adjusted measures such as the Sharpe ratio, beta and standard deviation added to HPR can provide a better indication of investment quality.

- **Contextualization of Risk Matters:** A high HPR through speculative or volatile investments may not be favored by risk-averse investors. It's not just the amount of return that matters, it's also a matter of quality of whatever is returned.

Taxes and charges may also have practical implications for how HPR is interpreted. The formula usually computes gross return, excluding capital gains tax, brokerage expenses and fund management fee. These expenses can severely diminish the investors' net yield.

In addition, inflation should be taken into account when assessing real return. An HPR of a nominal 8% in a time of 6% inflation simply gives you only a 2% improvement in purchasing power. Therefore it is more effective to understand HPR in real terms for wealth growth.

- **Real Return View:** Nominal HPR can be misleading if inflation is high. When HPR is inflation adjusted then the value addition becomes more apparent.

With portfolios, HPR may be tracked on individual securities as well as source the portfolio. In portfolio performance reports, HPR can be broken down by asset class or sector, giving investors a sense of which pieces of the portfolio are contributing most to returns.

Lastly, although HPR is a key performance measurement, it is only one part of the investment analysis. Investors need to pair HPR with time and risk and other qualitative factors like management quality, prevailing economy scheme, market tendencies, etc., for making rational decisions.

### 7.1.5 HPR vs Annualized Return

A significant drawback of HPR is that it is not a time standardized measure. It tells you how much return an investment provided, but it doesn't tell you how long it took to earn that return. This makes comparing investments with varying lengths quite challenging. A 25% HPR, for instance, may be impressive when it comes to one year but very unimpressive when it's five years. To get around this, the concept of annualized return is employed.

Annualized Return (CAGR) Annualized Return, or Compound Annual Growth Rate (CAGR), is what an investment would return on average each year if the profits were compounded. This unit takes the compound effect into consideration, so as to enable comparisons with all investments regardless of their maturity period.

The annualized return can be computed from HPR using the formula:

22 Annualized Return =  $(1 + \text{HPR})^{1/n} - 1$

Where:

- HPR is the holding period return as a decimal.
- n = number of years investment was maintained

For instance, if you earned a 33.1% HPR on an investment over 3 years:

$$\text{Annualized Return} = (1+0.331)^{(1/3)}-1 \approx 0.10=10\%$$

In other words, even though overall the gain over three years was 33.1%, the stock appreciated at an annual rate of straight 10%.

- **Standard Comparison:** The annualized return value allows for a standard comparison that compares one investment to another investment while held for different lengths as if each was holding it for an equal length.

Purpose of HPR and annualized return is different. HPR is most applicable for calculating total gain over a particular amount of time (particularly short term or one time investments) On the other hand, annualized return is good for comparing long-term investment or looking at performance in part of portfolios where time is important.

Keep in mind, annualized return is counting on consistent compounding, something that doesn't always happen in the real world of the market. In noise environments, actual year-by-year performance can vary widely, so time-weighted or volatility-adjusted metrics might be more appropriate.

- **Assumes Even Growth:** The annualized return provides an "as if" growth rate that, if reported over a number of years, would have produced the same ending market value.

And annualized return is equally important to assess mutual funds, retirement portfolios, and long-term savings plans. If investors can choose between 2 funds, one with a historical HPR of 20% over the past 2 years and another with an HPR of 25% over the last 3 years, then the annualized return will help them to see which fund has been performing better efficiently.

Regulatory purposes and banking industry would use annualized returns over HPR so that misleading interpretation is avoided in performance reporting. This way, investors can directly compare returns across different holding periods.

In many investment disclosures, particularly in mutual funds or retirement accounts, you are required by law to show annualized returns so you don't misinterpret short-term gains.

In the end, an investor needs both HPR and annualized return as tools in their arsenal. HPR makes the direction of total gain clear, and annualized return incorporates time. Combined, they provide a complete picture on investment performance and offer invaluable insights for both emotion-free money managers and individual investors to make informed, strategic financial decisions.

## 7.2 Expected Return on Investment

Expected return investment is a fundamental idea in finance that is essential to the analysis of investments, managing a portfolio and appraising risk. It is the average return that investors expect to receive from an investment, based on all potential outcomes and their probabilities. The expected return doesn't mean you're guaranteed to get that return, but just as an idea of what's likely and useful when making decisions under uncertainty.

In the investment world, seldom is all clear. The returns of stocks, bonds or any financial instrument in the future span a spectrum of possibilities. The likelihood of each result can vary. The prospective return takes these probabilities into account to derive a weighted average expected return, providing with one number that describes the overall expectation of your investment.

EXPECTED RETURN – Is an especially important measurement when comparing investments of differing risk and potential return. It is not only useful for measuring individual assets but also essential in the construction of efficient portfolios. In conjunction with standard deviation or variance (a measure of risk), Sharpe can help investors determine under-valued assets or portfolios that offer the best return per unit of risk.

- Using Forecasts: The expected return is based on forecasts of future returns and their respective probabilities. It guides investors in making informed choices when the outcomes are unclear and wide-ranging.

The concept of expected return is fundamental to the Capital Asset Pricing Model (CAPM) and Modern Portfolio Theory (MPT). It provides investors with a way to quantify the return needed to compensate them for taking on risk, which helps direct security selection and how you build your portfolio.

### 7.2.1 Meaning of Expected Return

The expected return is the sum of all possible returns multiplied by their probability of occurrence. It is an estimate in terms of probabilistic framework, and frequently appears in decision-making under uncertainty. This one is important, because in investments the results are generally a range and not one single outcome.

For example, imagine a shareholder analyzing a share featuring various potential returns according to the state of the economy. Each possible result could have an individual rate of probability that the company has tied into market research, historical data, and economic forecasts. All these different potential returns are summed into one general number, the expected return, which is the most typical result that one would see on average over time if they were to execute a Phase Shift many times in pretty much the same way all of those hypothetical times.

- Probabilistic Return Estimation: Expected return provides investors with a quantified return statistic that is dependent on various potential outcomes, which can be helpful in times of uncertainty or high volatility.

The expected return also helps answer questions such as: "What would I have on average if I invested in this asset over and over again? It establishes an analytic basis for analysis of comparative advantage of existing alternatives, optimal decision-making in the presence of uncertainty and others.

Expected return would also make it easier to align with investor objectives. For instance, a pension fund with long-lived liabilities might have moderate though stable expected return expectations from its portfolio of assets, whereas the expectation on required rates of returns for investments by venture capital firms may be higher despite greater variance.

Expected return isn't a measure of what will be earned in any particular period. The realized return is larger or smaller than the expected value. Hence, while expected return is

useful for prediction and comparison, it needs to be read in conjunction with other risk measures as variance or standard deviation.

- Not a Sure Thing: The assumed return is just that, an assumption. It reduces the complexity of multiple potential outcomes into a single number, but this will likely result in returns that are very different.

7.2.2 Function:  $E(R) = \sum [p_i \times r_i]$

The mathematical formulation of the expected return can be expressed by formula:

4  $E(R) = \sum [p_i \times r_i]$

Where:

- $E(R)$  = Expected return
- $p_i$  = Probability of i-th Outcomes of outcome i
- $r_i$  = Return if event i occurs

$\Sigma$  = Summation over all Potential Outcomes (i = 1 to n)

This formula only holds for a finite set of outcomes, each having an assigned probability and return. The investor gets the expected return by multiplying each return to its probability and summing up.

- Probability Weighted Model: The equation assigns weights to different Return possibilities, such that more probable outcomes contribute a greater portion of the total estimate.

For instance, consider what would happen if an investor had 3 potential outcomes for a stock:

- A 20 percent return with a 30 percent probability
- A 10 percent return probability of 50 percent
- A -5% return with a 20% probability We can use the formula:

$$E(R) = (0.30 \times 0.20) + (0.50 \times 0.10) + (0.20 \times -0.05) = 0,06 + 0,05 - 0,01 = 10\%$$

So the future value on this stock is 10% even though it contains a potential loss. This helps the investor to weigh potential gains and losses, so as to take decisions in a more informed manner.

This model is also relevant for scenario analysis, decision trees and stochastic simulations where future states of the world cannot be predicted nor can their resulting financial impact.

- Situation Neutrality: The expected return equation is applicable to both discrete and continuous distributions so it can be used in academic modeling as well as practical forecasting.

Furthermore, in case the probabilities are not available, historical frequencies can be considered as estimates. But investors should beware as past performance is not necessarily indicative of future results.

### 7.2.3 Weighted Average of Probable Outcomes

Cumulative return is a weighted average, this must not be confused with arithmetic. In the crude average, all results are considered the same. Conversely, a weighted average will provide more weight to values that are more probable, and better reflects in-field probabilities.

Weights (probabilities) are used to make the expected return reflect the probability of each return. This is especially relevant for financial decisions, as all results are not of equal likelihood. Giving weight to each potential outcome using expected likelihood enables a risk-informed calculation of return.

- Strategic Toolbox: Weighting possible outcomes allows investors to give precedence to those returns which are the more probable, and provides an accurate valuation of anticipated investment performance.

Assume a bond has three potential yields given an interest rate fluctuation: 5%, 6% and 7% with probabilities of occurring in equal to 0.2,0.5,and.03 respectively. The expected return is:

$$E(R) = (0.2 \times 0.05) + (0.5 \times 0.06) + (0.3 \times 0.07) = 0.01 + 0.03 + 0.021 = 0.061 \text{ or } 6.1\%$$

With an average yield of 6.1% predicted it doesn't just average out the yields but takes into account how likely they are, giving us a more nuanced metric.

Yet another field is portfolio optimization, here the return of a portfolio is merely an average return weighted by percentages of investment in individual stocks.

- Portfolio-Level Application: A key input in asset allocation is the weighted average of returns that one expects. In other words, by setting weights investors can influence expected return as well as overall portfolio risk.

The concept of weighted average is equally important in the context of risk return trade off.  
2) Combining the risky assets in a portfolio allows investors to engineer the weights so that they obtain (or pursue) a target expected return but will not take more risk than desired.

#### 7.2.4 The Use of Expected Return in Portfolio Selection

Expected return is an important parameter in choosing a portfolio especially under Modern Portfolio Theory (MPT) context. Investors seek to achieve the most return possible for a given level of risk or the least risk for a given expected return. (1) The expected return is the basic quantity required to optimize this.

When building a portfolio, the projected return for each asset is estimated as a function of historical performance, future expectations and economic scenarios. These returns are then summed, weighted by the portfolio's weights to yield an expected return for the total portfolio:

$$E(R_p) = \sum [w_i \times E(R_i)]$$

Where:

- $E(R_p)$  = Expected return on the portfolio
- $w_i$  = share of overall investment in asset  $i$
- $E(R_i)$  = Expected return on  $i$  th asset

Portfolio Return Forecasting - Investors can estimate how a portfolio thinks it will perform based on current allocation strategies by determining weighted average expected returns.

An expected return helps investors answer the following questions:

- How well should my investment strategy do?
- Do I need to rebalance my portfolio in order to enhance returns?
- What assets drive performance on average?

It is also helpful in building risk-adjusted portfolios. Risk is not measured by expected return alone, so it is common to also use volatility or beta to determine efficient portfolios on the efficient frontier.

- Trade-off between Risk and Return: Expected return combined with measure of risk provides investors a path to select the most efficient set that corresponds their investment objective in terms of his/her desired level of risk.

Expected return is also important in capital budgeting (i.e., investment decisions across projects). The one with the highest expected return (per unit of risk) will be typically chosen as long as it exceeds the cost of capital.

In the context of portfolio theory, both the Sharpe ratio, Treynor ratio and Jensen's alpha are all based on expected return in order to compare performance to risk and market benchmarks.

#### 7.2.5 Limitations of Expected Return in Uncertain Markets

While useful, expected return has flaws, especially in the face of volatile or uncertain markets. The main drawback resides in its usage of assumed probabilities, which might not accurately capture the real-world probabilities. Markets are not static and probabilities can change quickly on the back of economic circumstances, geo-political events or a sudden catalyst.

You can also use it on a constant-growth model where the average probability and return remain steady. In reality, investor sentiment, interest rate and company performance change dynamically and a static model can sometimes be unreliable in the dynamic place.

- Assumption Dependency: The precision of expected return largely relies on input assumptions' quality. Mistakes in these estimates can also result in poor investment decisions and misperceptions of risk.

Second, expected return doesn't take into consideration tail risk—low-probability but high-consequence extreme negative events. A portfolio might appear to offer an attractive expected return but contain significant exposure to rare yet devastating losses.

Second, it should be noted that our estimate of expected return does not capture variability or dispersion around these returns. Two investments may have the same expected return but very different risk. The picture is incomplete, however, if such measures as standard deviation or Value at Risk (VaR) are lacking.

No perception on Volatility - Expected return cannot be used in isolation to evaluate risk as it does not tell us how much actual returns may fluctuate around the average.

Another point is that expected return does not account for investor behavior and market irrationality either. In actual markets, behavioral biases such as overconfidence, loss aversion or herding may result in distorted outcomes making probabilistic forecasts wrong.

Lastly, the use of historic data to estimate expected return may be misleading if historical conditions do not continue. Markets change, and things like technology changes, regulatory changes or demographic shifts could have a dramatic impact on going forward likenesses.

### **“Activity: Build Your Own Scenario Model”**

In this activity, learners will construct a scenario-based return model for a hypothetical stock. They will identify at least three economic scenarios (e.g., recession, stable growth, and boom), estimate potential returns under each, and assign probabilities to each scenario. Students will then calculate the expected return using the  $E(R) = \sum [p_i \times r_i]$  formula and interpret the result in light of investment decisions. The activity promotes critical thinking about uncertainty, risk estimation, and the influence of probabilities on decision-making.

### 7.3 Standard Deviation as a Risk Measure

Standard deviation: Standard deviation (SD) is the most commonly used tool to quantify the risk when analyzing investments. In financial analysis, it is used to measure the daily price change of a security corresponding to the expected return. It quantifies the extent to which returns vary around the average (or mean) return, offering insight regarding the predictability and stability of an investment.

Unlike statistics that merely capture central tendency, like average return or expected return, standard deviation zooms in on dispersion — how far away outcomes drift from the mean. The higher the value of the standard deviation, the riskier and more uncertain that investment is likely to be; the lower it is, the less risky and more predictable are returns. In other words, standard deviation answers a crucial question for investors: How much can the realized return differ from what is anticipated?

It is a commonly used risk metric in portfolio theory, risk-adjusted return models and performance reporting. It allows to measure investment risk, to compare alternative assets and portfolios in which they are present. Even though it's a physical or mathematical term, standard deviation is very intuitive when you apply it to explain how erratic – or how stable – an investment's history of returns has been.

- Quantitative Volatility Indicator: Standard deviation is a measure of how far returns are spread out around the mean and is particularly useful for measuring investment risk.

Standard deviation, along with expected return, provides a full conceptual understanding of an asset's risk and return profile. It is additionally a required input in several important financial models, including the Sharpe ratio and Modern Portfolio Theory.

#### 7.3.1 Definition and Concept of Dispersion

In statistics, dispersion is the variability or spread in a set of data. With respect to returns, dispersion is a measure of how much returns deviate from the average (or mean) return over a period of time. The more spread out this distribution, the less certain the return on investment is, and hence the riskier people perceive such an asset to be.

5 The average of the squared deviations gives a single value that describes variability, but it is particularly awkward in an intuitive sense. The SD measures distance of each data point (return) from the mean return. It is the square root of variance, which is defined as the average of squared deviations from mean.

Dispersion is so important in finance because financial assets do not deliver fixed returns. Markets are impacted by a variety of things, from macroeconomics and geopolitics to specific company news and investor sentiment. It is these factors that make returns variable, and it's important to have a sense of how variable they can be so one can manage the risk.

- Measures Uncertainty: Dispersion measures the degree to which an investment is unpredictable providing investors with a sense of how consistent or inconsistent past returns have been.

2 Dispersion also serves to differentiate between a theoretical and an actual investment opportunity by differentiating among assets with similar expected returns but a variety of risk. For instance, two stocks could both have an expected return of 8%, but the standard deviation for one is 5% and the other has a standard deviation of 15%. The one with the higher std dev is riskier because returns are more volatile.

Other measures of dispersion are range, mean absolute deviation and interquartile range but standard deviation is widely used in finance as the easiest to mathematically model, particularly under the assumption that returns are normally distributed.

Dispersion is also important in performance reporting, where portfolio managers are interested not just in maximizing return, but minimizing the range of returns to ensure client expectations will be met.

- Compute for comparison: Dispersion can help investors compare assets that have similar returns, making it clear which of the two is more stable or more volatile.

Dispersion also provides the groundwork for other sophisticated risk measures, including VaR and CVaR, both of which rely on distribution properties in order to estimate a worst-case scenario at a level of confidence.

### 7.3.2 Formula and Calculation of Standard Deviation

Standard deviation is the square root of variance, which gives us a measure of how far each data point in the set is from its mean. The formula for sample standard deviation of investment return is:

$\sigma = \sqrt{[\sum(R_i - \bar{R})^2 \div (n - 1)]}$  where  $\sigma$  is the standard deviation,  $R_i$  is each individual test result and  $\bar{R}$  mean of all test results, and  $n$  number of tests conducted.

Where:

- $\sigma$  = Standard deviation
- $R_i$  = Return in period  $i$
- $\bar{R}$  = Average (mean) return
- $n$  = Number of return period
- $\sum$  = Summation symbol

This formula measures how far each return is where the average return is. The squaring allows for equal weight being placed on deviations above and below the mean, and taking the square root corrects back to original units of return.

- Square-Root of Variance: An improvement on variance, standard deviation is a smoother more readable return-based measure as it transforms the turnover.

Let's say we have an asset that has monthly returns: 3%, 7%, 2%, 6% and 4%. The average return is:

$$\bar{R} = (3+7+2+6+4) \div 5 = 4.4\%$$

Next, take the difference from the mean for all of your observations, square them, sum them up and divide by  $(n - 1)$ .

- $(3 - 4.4)^2 = 1.96$

- $(7 - 4.4)^2 = 6.76$

- $(2 - 4.4)^2 = 5.76$

- $(6 - 4.4)^2 = 2.56$

- $(4 - 4.4)^2 = 0.16$

$$\text{Variance} = (1.96 + 6.76 + 5.76 + 2.56 + 0.16) / 4 = 4.3$$

$$\text{S.D.} = \sqrt{4.3} = 2.07\%$$

This number clearly indicates the difference per month between the returns and approximately 2.07% from 4.4%, that is why it is a good measure of volatility as well..

- Applicability: Among practical uses of the standard deviation are interpreting past performance to measure risk during future time periods, standards for return fluctuation.

It is important to understand the difference between sample standard deviation and population standard deviation. In the vast majority of financial instances, however, we deal with samples (i.e., past data), and therefore we utilize for our denominator expression not  $n$  but  $(n - 1)$  for sample correction.

### 7.3.3 Interpretation: Low vs High Volatility

The explanation of what standard deviation means is based upon the fact that an investment's returns spread out in relation to the average. A small standard of deviation indicates the investment returns are close to the mean, which is a stable and low risk category. A high SD, on the other hand, indicates that returns spread out far from the mean return value indicating higher volatility and greater risk.

This distinction is critical in risk management and the portfolio evaluation. Low volatility is what an investor scared of risk desires, even if it means settling for marginally smaller gains. Investors who can tolerate higher risk might choose high volatility to reach for potentially higher returns.

- Consistency Indicator(s): A low standard deviation means the fund is less volatile since it has been able to maintain performance and reduced risk of a large deviation in return, thus more attractive to conservative investors.

Let's consider two funds:

- Fund A: 10% return, SD 3%

- Fund B: Average return 10%, standard deviation of 12%

Though both funds have the same average return, Fund B is much riskier. This goes to show that standard deviation adds an essential element of context that expected return alone cannot give.

Investors will also need to think about the dispersion of returns. Also standard deviation assumes normal distribution of returns while returns can instead be skewed or exhibit kurtosis (fat tails). This can result in underestimation of risk during extreme events.

- Risk Beyond Averages: High standard deviation equals greater expectation of extremes, whether positive or negative. Therefore, deduction should take into account investor risk tolerance and investment objectives.

Standard deviation is also time dependent. For example, annualized standard deviation is not comparable to monthly standard deviation. Investors need to use a standardized measure of time when comparing one asset or portfolio with another.

And, of course, standard deviation based volatility is not automatically bad. High volatility can be an opportunity for traders and other short-term investors who profit from price gyrations. Accordingly, the interpretation of such should depend upon the existing or planned investment strategy and objectives.

#### 7.3.4 Role of SD in Portfolio Risk Assessment

The standard deviation is one of the most important metrics to determine the total risk of a portfolio for both its asset contributions and overall portfolio volatility. When different assets are combined it is not just a simple weighted average of the individual standard deviations that represents portfolio risk. It is then not so much a question of the distance in any sense, but how the assets play with each other – that would be their correlation.

The Two-Asset Portfolio's Standard Deviation The standard deviation for a two-asset portfolio is as follows:

$$\sigma_p = \sqrt{w_1^2\sigma_1^2 + w_2^2\sigma_2^2 + 2w_1w_2\rho_{12}\sigma_1\sigma_2}$$

Where:

- $\sigma_p$  = Standard deviation of the portfolio

- $\sigma_1, \sigma_2$  = Standard deviation of asset 1 and 2
- $w_1, w_2$  = Portfolio weights of asset 1 and 2
- $\rho_{12}$  = Correlation between asset 1 and asset 2

This formula reveals that the risk of a portfolio comes from not only the volatility of individual assets but also how they move with others.

- Diversification Insight: When assets are not perfectly correlated, the standard deviation of the portfolio is less than that of its more volatile asset, and total risk decreases.

So by grouping low and negative correlated assets, investors can reduce risk through diversification. This is basic principle of portfolio construction according to Modern Portfolio Theory.

Standard deviation can also be used to support risk budgeting, when investors establish a ceiling for how much volatility is acceptable and construct portfolios that fall under this limit. It's useful to stress test portfolios in unfavourable conditions, providing scenario analysis and strategic allocation.

- Volatility Control Ploy: Managers use standard deviation to check and control risk exposure, especially in institutional situations where risk is restricted by policy.

Also, the portfolio standard deviation in passive or index investing is taken to be overall market risk, while for actively managed portfolios, it is typically compared with benchmarks as a measure of excess variance.

### 7.3.5 Relation to Sharpe Ratio (Brief Intro)

Standard deviation is a primary element of the Sharpe ratio, which is among the classic and most widely used risk-adjusted performance measures. The Sharpe ratio measures the amount of excess return produced for each unit of total risk.

The formula is:

Sharpe Ratio =  $(R_p - R_f) / \sigma_p$  where  $R_p$  = return of the security over the period,  $R_f$  = risk-free rate,  $\sigma_p$  = standard deviation of the security return. In a portfolio context: Sharpe ratio is a measure of excess return per unit of risk.

Where:

- $R_p$  = Return of the portfolio
- $R_f$  = Risk-free rate
- $\sigma_p$  = Portfolio's standard deviation

The denominator in this case is the standard deviation, used as a surrogate for total risk. The higher the Sharpe ratio, the better the performance for each unit of risk undertaken as investors can determine whether returns are gained through smart investment decisions, or simply by increasing risk.

- Risk-Reward Leveler: Sharpe ratio divides return by standard deviation so that you can make apples-to-apples comparisons between investments with varying degrees of volatility.

Therefore, standard deviation is not only a risk measure but also a component of the investment efficiency assessment system. So a portfolio with high returns but massive volatility may actually have lower Sharpe than a lower returning (but more stable) investment.

Choose correct options:

1. What does a high standard deviation in investment returns indicate?
  - a. Stable performance
  - b. Lower risk
  - c. High volatility
  - d. Consistent return
  
2. Standard deviation is the square root of which of the following?
  - a. Average return
  - b. Expected return
  - c. Variance
  - d. Mean
  
3. Which statistical measure is used alongside expected return to form the Sharpe ratio?
  - a. Alpha
  - b. Beta
  - c. Standard deviation
  - d. Correlation
  
4. In portfolio theory, what reduces portfolio risk when standard deviation is applied correctly?
  - a. Higher beta
  - b. Asset diversification
  - c. Increased leverage
  - d. Longer holding period
  
5. What is the main role of standard deviation in finance?
  - a. Calculating taxes

- b. Forecasting GDP
- c. Measuring volatility
- d. Tracking dividends

## 7.4 Limitations of Traditional Metrics

Classic financial values, i.e., expected return, standard deviation and Sharpe ratio are basic ingredients in investment analysis. However, even as commonly applied methods, these measurements have deficiencies. Many of them rely on simplifying assumptions such as normal returns distribution, linear relationships between returns and risks, static market environments which are rarely observed in practice. As financial markets grow increasingly complex and dynamic, it may be dangerous to depend on these purely traditional measures as an exclusive means of evaluating risk and return.

And they have to know the weaknesses of standard measures. Such non-linear, volatile and extreme-market conditions demand an accurate understanding of risk by investors, analysts and portfolio managers. This section presents these limitations and the necessity for innovative tools and methods to improve the methodology, supporting financial decisions.

### 7.4.1 Inability to Capture Tail Risk and Black Swan Events

Means for traditional risk Measures, the standard deviation and variance assume that average dispersion around the mean is to be analyzed. They take for granted that risk is symmetric and most of the outcomes cluster within a knowable range. Yet in actual financial markets, unusual but extreme events — called tail risks or black swans — disproportionately damage portfolios.

Tail risk is the possibility of rare events occurring in the tails of a distribution, which are statistically unlikely but have very high impact. SD operates under the assumption that returns are normally distributed, and that a series of events over 3 SD away from the mean is very rare. But in financial markets, these things occur far more often than the normal model would predict.

- Tail Risk Monitoring: Conventional gauges of tail risk understate the likelihood of extreme losses, leaving portfolios vulnerable to potential shocks like market crashes, financial crises or geopolitical turmoil.

A black swan event, a phrase coined by Nassim Nicholas Taleb, is an unforeseen outlier that exists beyond normal expectations and has extreme consequences. The 2008 global financial crisis, the

COVID-19 market crash, or the 2015 Swiss franc unpeg. Such events are not considered in standard models and the traditional measures of risk are unsuited to real-life crises.

Example: A portfolio whose average return is 8% and standard deviation is 5% would seem to be a stable one. Yet during the market crash from COVID-19 in March 2020, equity markets dropped over 30% in a matter of a few weeks — far beyond what we would have expected to see as according to the normal distribution.

- Real-World Miss: Metrics which rely on symmetrical return distributions fail to identify asymmetric risks that are faced by leveraged and option-rich portfolios.

To address this deficiency, investors and institutions are increasingly turning to stress testing, scenario analysis, and models that measure kurtosis and skewness to gauge exposure to fat-tailed events.

#### 7.4.2 Assumption of Normal Distribution in Returns

The most fundamental assumptions of traditional risk-return metrics is that returns on investments are normally (Gaussian) distributed. This mathematical convenience also makes statistical modeling simplification. But we have empirical evidence that financial returns are seldom normally distributed.

A Gaussian distribution is symmetrical about its mean (mean and median are equal), and forms a bell-shaped curve where 68% of the points lie within 1 standard deviation of the

8 mean, 95% are found within two standard deviations, and so on. But in the real world, asset returns are often skewed and exhibit fat tails, so they don't obey this assumption.

- Left and Fat tailed Distributions: Many asset classes can be seen to have both left or fat tailed distributions that cannot simply be explained by normal distribution.

29 Example: A stock index with an average monthly return of 1% and standard deviation of 3%. In a normal distribution, monthly losses worse than 10% would be very infrequent (lower than 0.1%). But such losses have been repeated on numerous occasions in history — say, during the crash of 1987, the collapse of 2008 or the panic of a pandemic.

Measures like standard deviation and Sharpe ratio are agnostic on direction, meaning they treat upside and downside volatility equally. But downside risk is what investors care most about. If they go down 15% in one month, it has a much bigger effect than if it went up 15%, but standard deviation would treat them the same.'

- Misleading Risk Measurement: If normality is assumed, the likelihood of a large loss (the tail risk) is underestimated, leading to inadequate crisis planning.

Also, when financial returns are non-Gaussian distributed, alternative assumptions on the independence and stationarity of returns could be violated as well. This undermines them even more because they rely on past data to predict.

For better accuracy, a growing number of risk models today even use non-parametric methods, Monte Carlo simulations or Extreme Value Theory (EVT) to more accurately mirror the nature of the return distribution.

### 7.4.3 Limitations in Non-Linear Instruments (e.g., Options, Derivatives)

Conventional risk and return measures rely on linear input to output relationships. What they do is just to suppose that if you are doubling the exposure or doubling the movement of a certain asset then you are obtaining as well double return. This presumption is false as opposed to non-linear securities, like options, futures, or structured products.

As options tend to induce non-linear behavior themselves (i.e., due to strike prices, time decay, volatility dependence or leverage), this makes the derivative itself mostly non-linear. An option's value, for example, does not move in a straight line with the price of the underlying asset. Rather, it reacts in a non-linear and frequently asymmetric way to the several factors involved.

- Linear Models Fail for Complex Instruments: Standard deviation and beta capture previous volatility or market exposure, but they are blind to the convexity of option payoffs or sensitivity to metrics such as implied volatility.

Sample: A portfolio with a long call option might lose all of its premium if the stock does not trade above the strike price, but that loss can be multiplied many times over if the stock makes large gains. This positively skewed risk-reward profile wouldn't be accurately represented by traditional measures like standard deviation.

Another would be a collar (buying a protective put and selling a covered call). The return distribution is truncated — capped to the upside and floored to the downside. Traditional metrics will miscast the such strategies as low volatility, however this low volatility is simply a result of structurally capped upside and not intrinsic stability.

- Non-Linear effects: In options and derivatives, the return curve curves. To encapsulate risk in several dimensions, we require to use tools such as delta, gamma, vega and theta.

Hence, with traditional models, the valuation of portfolios that have certain instruments, such as exotic derivatives, is insufficient or simply erroneous. These instruments need sophisticated modeling, for example option pricing models (like Black-Scholes), sensitivity analysis (the Greeks) or risk estimation through simulation.

#### 7.4.4 Static Case: Disregarding Dynamic Market Situation

The "traditional" metrics usually are computed with regard to historical data over fixed time units, e.g., 3-year monthly returns. Instead, they take markets to be static things with relationships between assets, volatilities and expected returns stable over time. But markets are fluid, shaped by shifting economic conditions, investor moods and world events.

This static nature results in traditional metrics lagging during market moves. For instance, a stock might have experienced little volatility over the past two years, but some macro monetary or earnings development regarding it could introduce huge risk going forward. But a historical standard deviation would have failed to grasp this.

- **Lagging Indicators:** The standard deviation and beta are rear-viewed. Such estimates of risk conditions in times of ongoing or prospective market structural change may be out-of-date.

Example: In 2007, basic risk models indicated that there was little volatility between world markets. But in 2008, with the onset of a credit crisis, correlations surged and volatility soared, demolishing these assumptions and making historical risk measures misleading.

Furthermore, asset correlations are time varying, an important input into portfolio risk models. During periods of market distress, the benefits afforded from diversification tend to break down, as correlation cycles higher towards 1.0. Hence, a static correlation-based constructed portfolio can collapse in grave moments.

- **Systematic correlation and Cointegration fails:** Classic models assume constant correlations. These assumptions get shattered during crises, causing all supposedly uncorrelated assets to go down at the same time.

More sophisticated models like EWMA or GARCH include estimates based on recent volatility, in order to cope with changes that might be dynamic. In addition to this, machine learning models and real-time data analytics are now being employed to increase the responsiveness.

#### 7.4.5 Requirement for Advanced Tools: VaR, Beta, Alpha

With the constraints of legacy framework, there is an obvious requirement for new generation tools which offer sophisticated and agile risk analysis. There are three most commonly utilized instruments in this process and those are: **Value at Risk (VaR)**, Beta, and the Alpha.

Value at Risk (VaR) is used to estimate the maximum potential loss over a specified holding period at a certain confidence level. For instance, a daily VaR of \$1 million at 95% confidence indicates that on an average loss will exceed \$1

million only 5% of the time. Compared to standard deviation, VaR is directly answering the question “how bad could things get?”

- Double Tail-Risk Emphasis: VaR measures extreme levels of loss at particular confidence levels, for a more realistic perspective on potential downside risk than variance-oriented systems.

Beta reflects how much an asset's return is likely to swing in response to market moves. A beta of 1.2 implies that the assets are 20 percent more volatile than the market. It allows investors to get a grip on systematic risks, the portion of total risk that cannot be diversified away.

EMH, however does not explain the existence of alpha or risk-adjusted return which is defined as above-average returns generated by an asset or portfolio in excess of that predicted from exposure to the market (as measured by beta). It's representative of a manager's skill, or strategy success. A positive value of alpha indicates outperformance and a negative value reflects under performance.

Example: A mutual fund with a beta of 1.1 and returned 12% when the market made only 10%; its positive alpha shows it gained more than anticipated for the additional risk taken on.

- Performance Attribution: Alpha and beta offer an analysis of how much return was added due to the market versus a manager's decisions.

These highly sophisticated tools provide a more nuanced and forward-looking view of the risk/return characteristics. They also facilitate capital allocation and regulatory risk reporting in an institutional context. When used alongside scenario analysis and stress testing, they serve as a powerful vehicle to manage financial portfolios in an opportunity-laden world.

## 7.5 Summary

3 Holding Period Return (HPR) is a measure of the total return that an investor has earned from an investment over the period in question, including income and capital gains.

Expected Return is the sum of weighted outcomes, where weight is given by probability associated with each outcome.

The SD measures the spread of investment returns around the average and is a statistical measure of volatility or risk.

Expectational Return and Standard Deviation are used in concert to analyze the risk-return trade-off for investments and portfolios.

HPR is good for single-period return analysis, although it isn't time-adjusted; annualized returns correct this problem by expressing a geometric average each year.

Traditional risk measures are normally based on the notion that returns follow a normal distribution, which may underestimate large events or markets' crashes.

Standard deviation treats upside and downside volatility symmetrically; Source: Yugreeusindhuugul, Thunkar et al.

Non-linear instruments such as options are difficult to analyze within classic risk-return models because of their non-symmetry nature of risks.

Advanced Analytics Value at Risk (VaR), Beta, and Alpha which contribute to performance attribution analysis are also used for tail risk.

Static risk models fail to account for phenomena, such as varying volatility and correlations in the market, so that these are flawed in a real-world context.

☐ Diversification can reduce portfolio risk but the effectiveness is diminished as a result of correlation changes during market stress in that dynamic modeling is important.

☐ Investors need to tap into both conventional and sophisticated instruments in order to understand the investment opportunities available in markets that are complicated and volatile.

## 7.6 Key Terms

**Holding Period Return (HPR):** Total return realized from the time an investment is held.

**Expected Return:** Weighted average of all the possible returns, according to their estimated probabilities.

**SD or Standard Deviation:** A measure of the fluctuation in the return provided by a security from its mean.

**Annualized Return:** The average annual return over a period of multiple years, considering the effect of compounding.

**Sharpe Ratio –** A risk-adjusted return metric that measures excess returns per unit of volatility.

**Tail Risk:** Possibility of infrequent and extreme events that fall outside of the tails of the return distribution.

**Black Swan Event:** An event that is unexpected, or unforeseen and whose impact is not reflected in routine models.

**Skewness:** A measure of a security's return distribution's asymmetry.

Kurtosis: Measure of the "fat tails" or extreme outcomes to a probability distribution.

Beta: A measure indicating how sensitive an asset is to market movements.

Alpha: A measure of an investment's return in excess of what a security's price movements would predict, given its beta.

Value at Risk (VaR): Amount of potential loss at a specified level of confidence, for a specific time period.

## 7.7 Descriptive Questions

Describe the elements and the formula of Holding Period Return (HPR) using a numerical example.

A1) Explain the expected return and how it is useful in a portfolio selection.

Explain standard deviation interpretation and how it affects investment decision.

What are the main problems with typical risk-return measurements in non-stationary or volatile markets?

How is the standard deviation limited by normal distribution?

How do linear and non-linear instruments use risk modeling differently?

Explain what is value at risk and what is the importance of VaR, Beta and Alpha in the present day risk analysis.

How does diversification lower risk, and why can it sometimes be disrupted when markets are in crisis?

## 7.8 References

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## Knowledge Check 1

1. c. High volatility
2. c. Variance

3. c. Standard deviation
4. b. Asset diversification
5. c. Measuring volatility

## 7.9 Case Study:

### Background

Orion Asset Management is a medium-sized investment advisory firm servicing wealthy high-net-worth individuals and institutional investors. Recently, the firm's portfolio construction process has become more and more quantitative with a particularly heavy reliance on traditional models to evaluate assets' performance and hence optimize portfolios' designs: such as expected return, standard deviation, Sharpe ratio or beta.

The Orion flagship portfolio is the Orion Balanced Strategy (OBS) which has generated a long-term average annual return of 9% with an accompanying standard deviation of 10%. The portfolio is made up of blue chip stocks, government bonds, and a small holding in index options. The strategy has proved its mettle in the relaxed atmosphere of stable markets over the last five years.

It's an observable fact Regular readers know that I am a big fan of options, but I recently confronted a case where things went wrong: last March and the Covid-19 market crash The portfolio was down 24% over three weeks, well beyond what historical volatility suggested would happen. Many clients were caught off guard (and upset), and the firm's risk team took another look at its risk models, performance attribution tools.

### Problem Statements

## Gaps Between Risk Predicted and Observed

How did Orion's historical models not predict the amount of losses taken on during the market downturn?

## Static Risk Presumptions in a Changing World

How was the overuse of historical standard deviation and normal distribution a source of error to the firm in a time of highly remarkable turbulence?

## Inadequate Representation of Non-Linear Instruments

Why did the portfolio shares disproportionately add to losses, when they were only 8% of the asset mix?

## Solutions

### Describing and Managing Tail Risk and Black Swans

The firm's reliance on standard deviation as the principal risk measure did not account to tail risks. These risks, such as COVID-19 type black swan events, are in the tails of the distribution and can't be modeled when we assume normality and symmetry. Orion need stress testing, scenario analysis and Value by Risk (VaR) models to be better prepared for extreme events.

### Upgrading to Dynamic Risk Models

The company's static risk models that were based on historical data became inadequate in the volatile market. I'd want a model able to respond to evolving markets. Orion can better estimate time-varying volatility through the use of GARCH models or exponentially weighted moving averages to get a truer sense of real-time risk.

## Modeling Non-Linear Exposure Accurately

A substantial influence of options was overlooked by the firm, as linear models were employed. Options have non-linear payoffs and its modeling requires the use of greeks (delta, gamma, vega). Leverage and convexity mean that even a small allocation to options can have enormous effects. Future risk factors will need to incorporate option-adjusted measures risks.

## Reflective Questions

How would the application of Value at Risk have altered Orion's perception of downside exposure?

Should Orion update their performance stats to utilize DD (rather than SD)? Why?

How does stress testing give a truer picture of portfolio strength?

How can option Greeks (Delta, Gamma, etc.) be incorporated in a holistic risk model without giving an incorrect picture of the risk of derivatives?

What can we learn about the idea of diversification when correlations spike in times of market stress?

## Conclusion

Orion Asset Management is a case which serves as a good example of why the use of traditional measures can be deficient in complex or volatile modern markets. Fundamentals Although expected return, standard deviation or Sharpe ratio are basic concepts, they cannot capture extreme risk, dynamic correlations and the properties of non-linear instruments. Make no mistake, companies like Orion must advance their risk management to include sophisticated quantitative models, dynamic volatility estimators, solution for

derivatives and tail events. Doing so allows them to construct durable portfolios that can withstand the harsh truths of global financial uncertainty.

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## Unit 8 Advanced Measures and Portfolio Performance

### Learning Objectives

1. Understand the limitations of traditional risk-return metrics and the need for advanced performance measures in investment analysis.
2. Identify and define key advanced metrics such as Alpha, Beta, Sharpe Ratio, Treynor Ratio, and Jensen's Alpha.
3. Analyze the effectiveness of risk-adjusted return measures in evaluating portfolio manager performance.
4. Apply advanced performance metrics to assess and compare the efficiency of different investment portfolios.
5. Interpret the implications of systematic and unsystematic risk in the context of Beta and portfolio diversification.
6. Evaluate the role of benchmarking and performance attribution in portfolio performance assessment.

### Content

- 8.0 Introductory Caselet
- 8.1 Sharpe Ratio and Its Application
- 8.2 Treynor Ratio and Comparison with Sharpe
- 8.3 Jensen's Alpha and Sortino Ratio
- 8.4 Beta and Its Use in Portfolio Performance
- 8.5 Summary
- 8.6 Key Terms
- 8.7 Descriptive Questions
- 8.8 References
- 8.9 Case Study

## 8.0 Introductory Caselet:

Nova Capital is a small investment management firm that specialises in actively managed equity funds. Nova's top product, the Nova Growth Fund (NGF), has been delivering returns that seem to beat the benchmark index over three years. The average yearly return for NGF has been 14% versus the benchmark's 11%. At face value it would appear that the fund manager is creating value through superior security selection and timing.

But when the company's recently hired quant took a look at performance through sophisticated lenses, things got muddy. The fund had a Beta of 1.4 which means that volatility in the fund is greater than the market. The Sharpe Ratio was only 0.55 compared to the benchmark's 0.75, which means there were lower risk-adjusted return despite higher absolute return.

It also found out that Jensen's Alpha was slightly positive by 0.3% and the Treynor Ratio overperformed the benchmark. These results suggest that a good fraction of the fund's outperformance can be explained by having a higher beta rather than superior skill. The members of the management team began worrying: should they keep marketing the fund as "outperforming," or would that be misleading if investors were not given anything to compare returns against in terms of the level of risk?

The fund cuts an aggressive posture, a strategy that the senior portfolio manager said would suit investors looking for growth who can tolerate higher risk. The head of marketing feared reputational harm, however, if clients discovered that the returns were actually not genuinely "alpha-generating" after considering risk.

To address the problem, the firm chose to install a more robust performance attribution system and update its investor communications to include both absolute as well as risk-adjusted performance.

Critical Thinking Question:

Given the sophisticated PM's already deployed, how should Nova Capital interpret the performance of its Growth Fund and communicate same to current (and prospective) investors? Is absolute return the most important thing or is it more suitable to measure portfolio returns in risk-adjusted terms?

## 8.1 Sharpe Ratio and Its Application

15 The Sharpe Ratio is one of the most popular and commonly used financial ratios or metrics in modern investment theory for measuring risk-adjusted return (think appetite). Invented by William F. Sharpe in 1966 and later improved, it promotes a comparison between the way different investments produce excess return for an amount of total risk we decide to take. 2 The Sharpe ratio is the average return earned in excess of the risk-free rate per unit of volatility or 19 total risk and provides a clear answer to this question: How much excess return am I receiving for the extra volatility that I endure in holding a risky asset instead of a risk-less asset?

The Sharpe Ratio is helpful because returns of investments with different levels of risk and return can be compared using a standard measure. Especially powerful for comparing investments between mutual funds, exchange-traded funds and portfolio strategies when the amount of volatility (standard deviation) varies greatly. Through a normalized measure of return versus risk, Sharpe ratio removes the bias toward higher return but riskier wealth-trading instruments and promotes discipline in portfolio selection and risk management.

Also, in an uncertain and volatile financial environment like that we face today, it is not enough for investors to wish for high returns – the consistency and predictability of those returns also matter. The Sharpe Ratio captures this trade-off and is widely used by academics and practitioners to aid in investment analysis, optimization, and performance evaluation of financial portfolios or funds.

### 8.1.1 Definition and Formula of Sharpe Ratio

24 The Sharpe Ratio can be expressed mathematically as the difference between a portfolio or investment's return and the risk-free rate, divided by its standard deviation. It simply explains the reward-to-risk trade off as it measures how much extra return an investor makes per unit 3 total risk borne.

Formula:

$$\text{Sharpe Ratio} = (R_p - R_f) \div \sigma_p$$

Where:

- $R_p$  = the average return of the portfolio or investment
- $R_f$  = Risk-free rate ( the interest rate on a risk free security )
- $\sigma_p$  = Volatility (standard deviation of) of the return on the portfolio

The excess return is the numerator,  $R_p - R_f$ —how much better-than-guaranteed the portfolio's performance turns out to be. The denominator,  $\sigma_p$ , is the volatility or risk which characterizes that return. So the Sharpe Ratio measures just how good were those returns, not how much they were.

- Risk-Adjusted Return Metric: The ratio gives a uniform metric across the projects and takes into consideration if a higher return can justify the extra risk undertaken by an investor.

Illustrative Example:

Let's say you have an investment fund set up like so:

- Annual return ( $R_p$ ) = 14%
- Risk-free rate ( $R_f$ ) = 4%
- Properties of the portfolio \* Volatility ( $\sigma_p$ ) = 10% In this case, Sharpe Ratio will be:

$$\text{Sharpe Ratio} = (14 - 4) \div 10 = 10 \div 10 = 1.0$$

This implies that the fund is able to produce 1.0 unit of excess return for each unit of risk it assumes -- a satisfactory performance level. Investors can use this number to compare the fund with others and even with passive index funds, to see if its active strategy outperforms in a risk-adjusted fashion.

We should also note that the Sharpe Ratio can be computed for various investment horizons (day, month, year, etc.). But the return and volatility must be on same level to be consistent. The Sharpe Ratio can also be implemented in forward-looking models, as in expected return analysis where we use time series of forecasted returns and volatility.

### 8.1.2 Interpretation of Sharpe Ratio

"If you need to "interpret" the Sharpe Ratio, it's because you don't know what it says about risk & reward." Likewise, a higher Sharpe Ratio implies that it is providing more returns for each unit of risk taken and therefore it is better from a risk-adjusted standpoint. Conversely, when the Sharpe Ratio is low or negative it means that performance is bad, either because returns are too low for the risk adjusted (where they should really be) or maybe even below a risk-free rate.

Common standards of interpretation for the Sharpe Ratio are:

- Sharpe Ratio 2.0: Outstanding performance, highest return/risk ratio and repeatable returns.

But they are not magic numbers. In highly volatile environments, or for those pursuing high growth strategies, even a Sharpe Ratio close to 1.0 may be considered robust. In calmer climates, that figure may be considered flat lining. Remember, the ratio is always relative and must be considered in relation to market environment, investment philosophy and investor goals.

- Return Quality Metric: Instead of simply measuring how much one is making, the Sharpe Ratio takes into account not only what is brought in, but how consistently it was acquired and whether there were fluctuations.

Comparative Example:

Consider two funds:

- Fund A: Return = 12%, Standard deviation = 10%,  $R_f = 4\%$  → Sharpe =  $(12 - 4) \div 10 = 0.8$
- Fund B:  $R = 10\%$ ;  $\sigma = 5\%$ ;  $R_f = 4\%$  → Sharpe =  $(10 - 4) / 5 = 1.2$

Although Fund A has greater absolute return, the tension is creating a better proportional return to risk for Fund B Risk-seeking investors will find fund A more attractive while risk-averse investors will find fund B more appealing.

Also, if Sharpe Ratio is negative, the investor would have been better inclined to not invest in a risky investment.

Also one should consider stability of Sharpe Ratio over time. While consistent high Sharpe Ratios across various time frames reflect quality performance, an abrupt fall may signal higher risk or lower quality of return.

- Time: How the Sharpe Ratio evolved over time may reveal changes in strategy efficacy, risk management discipline, or market exposure.

### 8.1.3 Application in Comparing Portfolio Performance

It is often used to evaluate the returns for one portfolio over another, particularly when such portfolios have different risk or strategy profiles or asset allocations. It is the standard measurement that allows investors to compare action on a relative basis.

This is useful in particular situations:

- Active vs Passive Management: Actively managed funds versus passive index funds on a risk-adjusted basis.
- Intermarket Analysis: Comparing equity versus fixed income portfolios.
- Hedge Fund Analysis: Separating risky, high-return strategies from those that are less so.
- BTA: Algorithm trading strategies or asset allocation models are tested back.
- Sharpe Ratio: Allows an objective comparison between two or more portfolios, irrespective of differences in size, risk and investment approach.

Practical Example:

Assume two balanced portfolios:

- Portfolio X: Return = 16%,  $\sigma = 12\%$ ,  $R_f = 3\% \rightarrow \text{Sharpe} = (16 - 3) \div 12 = 1.08$
- Portfolio Y: Return = 12%,  $\sigma = 6\%$ ,  $R_f = 3\% \rightarrow \text{Sharpe} = (12 - 3) \div 6 = 1.5$

Portfolio Y performs better on a risk-adjusted basis than that of nominal returns, and is preferred by investors who wish to maximize the efficiency for return.

From an institutional perspective, investment consultants and fund selectors frequently use the Sharpe Ratio as a principal screening tool to distinguish managers that produce alpha without incurring undue risk.

20 Portfolio optimization techniques, including Modern Portfolio Theory (MPT) based algorithms, utilize the Sharpe Ratio to identify ones on the efficient frontier---portfolios for a given degree of risk offering maximum returns.

#### 27 8.1.4 Sharpe Ratio vs Risk-Free Rate and Standard Deviation

18 The effectiveness of the Sharpe Ratio as a performance measure is highly dependent on two important inputs – the risk free rate and the standard deviation of returns. The two variables can heavily impact the calculated number and, as a result, how the investor views the risk-adjusted return.

#### 21 Influence of the Risk-Free Rate

The real treasury bill rate ( $R_f$ ) is the reference point when comparing whether the investor has been paid a sufficient reward for having borne risk. It describes the return you can receive that has no possibility of loss, often utilizing government-issued Treasury securities like 3-month T-bills. The Sharpe Ratio subtracts the risk-free rate from the portfolio return ( $R_p$ ) to differentiate between an return due to taking a risk.

In the era of low interest rates, which is where many markets in a post-crisis world have been living, are pumped up by this term, so that follows that the Sharpe Ratio will also be. On the other hand, with a high risk-free rate, good portfolio performance may have lower Sharpe Ratios while investments are underestimated.

Example:

- Portfolio return = 10%,  $\sigma = 8\%$  5.3 Range and rate of returns based on different probabilities  
Up to now, we have considered the expected rate of return and standard deviation as only a function of two parameters -  $E(R_p)$  and  $\sigma$  (rate of return) - even though these are derived from probability theory (probability distribution).

- If  $R_f = 2\%$ , then Sharpe =  $(10 - 2)/8 = 1.0$

- Sharpe =  $10 - 4 \div 8 = 0.75$  if  $R_f = 4\%$  Note: Inverse of this result is  $\beta/\sigma$  would obtain the same ratio.

This example demonstrates the fact that an increasing risk-free rate can lower Sharpe Ratios even with the portfolio return invariant. One also has to look at Sharpe Ratios in the current era of macro conditions and interest rates.

- Macro Sensitivity: The value of the Sharpe Ratio varies with the economic environment (business cycle) since risk-free also changes and should be interpreted carefully over time.

### Dependence on Standard Deviation

Standard deviation ( $\sigma$ ) is the denominator of the Sharpe Ratio and measures the overall volatility of returns—positive or negative. This approach has significant implications.

First, it assumes all volatility is bad when we know that is not the case (hurray for you, however - the stock market just sold off and took most of your client's valuations by 20%+ in a month). Most investors care about downside risk, not about how much growth you received on the upside. By punishing both Volatilities in the same way, the Sharpe Ratio may understate its appeal for Holdings with extreme but good variability.

Second, standard deviation presupposes the normal distribution of returns i.e., returns are universally distributed symmetrically around the mean. But a lot of financial instruments and strategies, particularly those that derive from derivatives, are characterized by distributions with fatter tails, or skewer shapes—where rare events together in big way analogically extreme outcomes would happen more often than one might predict.

- Symmetry Bias: That Sharpe Ratio denominator — quoting standard deviation — assumes your returns have a bell-curve distribution, something that wafts into the wind in volatile or illiquid markets.

Example:

A covered call can have a high Sharpe Ratio because of a low standard deviation, which compensates for limited upside. But during a sudden market drop, the downside loss can prove onerous. The Sharpe Ratio does not reflect this covert danger, offering a false sense of indifference.

Also, volatility may be time-dependent, (see in particular financial crises). Sharpe Ratio, as it uses historical standard deviation, may underestimate future risk for if volatility is expected to increase.

- Looking Back Limitation: Standard deviation is often calculated based on historical results. The Sharpe Ratio can be a poor guide to the future if market conditions change.

For this reason, other performance ratios like the Sortino Ratio (that only considers downside deviation) or Conditional Sharpe Ratio (that takes into account non-normal returns) might be preferred in advanced performance analysis.

### 8.1.5 Limitations and Assumptions of Sharpe Ratio

Although the Sharpe Ratio is one of the cornerstone measures in finance and investment analysis, it has its limitations and assumes several factors. Such constraints have the potential for distorting performance assessments, particularly in relation to intricate portfolios or the periods of extreme market movements.

#### Assumes Normally Distributed Returns

A fundamental hypothesis in the Sharpe Ratio is that returns to investments support a normal (or Gaussian) distribution – data is symmetrical around the mean. This latter assumption simplifies analysis, but it is typically an unrealistic one. In the real world, asset returns can be both skewed (asymmetric) and exhibit kurtosis (fat tails), meaning extreme values are more probable than normal distribution would forecast.

This creates an unnatural burden on the Sharpe Ratio to underestimate tail risk. For example, a portfolio that loses big on rare occasions might have an impressive Sharpe Ratio, but those wipeouts can still be very detrimental to investor capital.

- Tail Risk Blindness: It makes no allowance for black swan events or rare catastrophic losses and may overestimate portfolio safety.

### Punishes Upside and Downside Volatility

Volatility measured in the Sharpe Ratio Trading Plan standard deviation (positive and negative “swings”) are both equally treated. But investors usually like upside volatility and hate downside volatility. This equal treatment can have the effect of unfairly penalizing a fund with high but unpredictable returns, and making it appear to be more risky than it actually is.

Example:

Consider two funds:

- Fund A returns +3%, +5%, +2%, and then +4%
- Fund B has a return sequence of +10%, -3%, +12%, -2%

Fund B’s standard deviation might be higher, but a lot of the volatility comes from big gains. Sharpe Ratio would probably pick Fund A even though Fund B might make you richer over the long term.

- Non-Partitioning Volatility: Symmetric treatment of risk by Sharpe Ratio can obscure low-frequency high reward strategies with a periodical large positive deviation.

### Time Period Sensitivity

The Sharpe Ratio should only be used as an investment tool for a given time frame. Short-term data can be so noisy as to result in unstable, or misleading estimates; and very long periods would tend to average out through time periods of critical interest. Furthermore, an

incorrect annualization (either by a factor of 12 for the monthly SR or a factor of, typically 252 days) will produce biased conclusions.

And that Sharpe Ratios calculated over different periods (same thing for daily vs monthly annual as I'm sure you already realize) cannot be compared.

unless consistently adjusted.

- Frequency Mismatch Risk: Staggered time periods with return observations and standard deviation, can distort the Sharpe Ratio such that it becomes an unreliable comparative measure.

#### Ineffectiveness for Non-Linear Portfolios

When it comes to portfolios which also contains non-linear assets like options, convertibles or leveraged derivatives, the Sharpe Ratio doesn't perform that well. These instruments have non-symmetric payoff and risk structures that are not properly encoded by standard deviation.

In those cases, more advanced metrics such as the Omega Ratio, Sortino Ratio or risk attribution based on Greeks

(for options) are more appropriate.

#### No Insight into the Origin of Return

The Sharpe Ratio is a measure of how much return you are receiving per unit of risk, it does not tell us how that return is being generated. It doesn't know what portion of its profits come from simply being exposed to the market (beta) versus something attributable to skill or strategy (alpha). So it must be supplemented with some other indicators of performance, such as Jensen's alpha or Treynor Ratio to get the overall view.

- **Insufficient Attribution Insight:** By itself, the Sharpe Ratio provides little explanation as to where returns are coming from and additional analysis is required in order to have an informed decision.

### False Security in Low-Volatility Periods

In periods of low market volatility, the Sharpe Ratio can be distorted by noise. Investors think they are making good risk-adjusted money WRONG – investor actually assume high energy financial returns, but are just exposed to undetected or unobserved risks that come home to roost when we enter stress scenarios.

This perceived safety can breed complacency, overleverage and misallocation, particularly in structured or leveraged products.

## 8.2 Treynor Ratio and Comparison with Sharpe

Named after Jack Treynor, the Treynor Ratio (also known as "reward-to-volatility ratio") relates **excess return over the risk-free rate** to **the additional risk taken**; it is a fundamental of modern financial theory and Practice and it is closely related to the Sharpe ratio. In spite of evaluating the amount of return an investor earns above the risk-free rate, both ratios differ because they evaluate risk differently. The Sharpe Ratio is based on total risk (**standard deviation**), while **the Treynor Ratio only** looks at **systematic risk**—that portion of the overall required return that cannot be diversified away and is measured by Beta.

The Treynor Ratio is especially compatible with investment analysis and performance measurement of well diversified portfolios, where unsystematic (diversifiable) risk has been substantially reduced. For these portfolios, it is the systematic risk that matters most and Beta is more appropriate as a denominator than total.

volatility. The Treynor Ratio hence serves as a goal-oriented measure of return on per unit of risk in relation to market; it is extensively applied under Capital Asset Pricing Model (CAPM).

### 8.2.1 Definition and Formulation of **Treynor Ratio**

7 The Treynor Ratio computes how much excess return was generated per unit of systematic risk, with systematic risk being defined as the portfolio's Beta ( $\beta$ ). The ratio is intended to assess the degree to which a portfolio adequately rewards investors for the risks incurred in association with the market.

Formula:

$$\text{Treynor Ratio} = (R_p - R_f) / \beta_p$$

Where:

- $R_p$  = Return of the portfolio
- $R_f$  = Riskless rate of return
- $\beta_p$  = Beta of the portfolio (systematic risk measure)

This is a measure of how well the portfolio did in terms of market risk that cannot be diversified away, assuming there's no idiosyncratic risk left after diversification. As a result, it's most applicable in the case of well-diversified portfolios, mutual funds and market-tracking funds.

- 23
- Specificity of Risk Measure: The Treynor Ratio focuses on performance relative to market exposure and eliminates the noise from diversifiable risk that investors can eliminate through asset allocation.

Example:

Let's assume a portfolio with the following characteristics:

- Portfolio return ( $R_p$ ) = 13%
- Risk-free rate ( $R_f$ ) = 4%
- Beta ( $\beta_p$ ) = 1.2 Hence, the Treynor Ratio is:

$$\text{Treynor Ratio} = (13 - 4) \div 1.2 = 9 \div 1.2 = 7.5$$

This means that the portfolio got 7.5% of extra return for per unit of systematic risk it took. The higher the Treynor Ratio, superior has been its performance after adjustment for market risk.

The Treynor Ratio relies on the CAPM assumption that an increasing expected return is directly related to Beta. This suggests that risk-averse investors would tend to prefer portfolios with higher Treynor Ratio, provided they are comparing funds which are operating in similar market conditions or under the same investment mandate.

### 8.2.2 Use of Beta in Treynor Ratio

Beta ( $\beta$ ) is a fundamental component in the calculation of the Treynor Ratio, in which it measures how much a portfolio will move to general market shifts. If Beta = 1.0 it implies that the portfolio has moved in sync with the Market to any movement in Market would be reflected in Portfolio. Beta above 1.0 indicates higher volatility compared to the market as well as Beta below 1.0 means lower volatility relative to the market.

In the treynor ratio context, Beta measures an investor's systemic risk — a type of risk that cannot be diversified away. Systematic risk comes from interest rates, inflation, recessions in the economy and geopolitical uncertainty. Whereas standard deviation includes systematic and unsystematic risk, Beta measures the amount of risk associated with the broader markets.

- Non-Diversifiable Risk Estimate: Beta is used to measure the amount of risk in a portfolio that can be attributed to market movements, which makes it central for CAPM and Treynor Ratio.

### How Beta Affects Treynor Ratio:

- For a high Beta, if the portfolio returns are moderate, the Treynor Ratio could be small reflecting that it is not adequately compensated for market risk.
- If the Beta is low and the returns are high in this case, then Treynor Ratio will be high, indicating good performance per unit of market risk.

### Example:

Portfolio1 and Portfolio2 has the same return (10%) and riskfree rate (2%):

- Portfolio A: Beta = 0.8 → Treynor =  $(10 - 2) \div 0.8 = 10.0$
- Portfolio B: Beta = 1.5 → Treynor =  $(10 - 2) \div 1.5 = 5.33$

Portfolio A has more Treynor Ratio, and is thus more effective for turning market risk into return.

However, Beta comes with limitations. It is a backward-looking measure and commonly estimated by regressing historical series of portfolio returns on the market index. This might cause a delay in time and model error, especially when in the volatile periods and its related to the asset/market link behavior.

- Stability Issue: As Beta changes with time and is highly sensitive market vagaries, if values are being pulled from a date too far away or were estimated incorrectly the Treynor Ratios can be misleading.

While there are shortcomings to Beta, used properly—particularly as applied to diversified portfolios—it is a useful tool in performance analysis, and its integration into the Treynor ratio gives valuable information on how efficient a portfolio is in exploiting market exposure.

### 8.2.3 Comparing Sharpe and Treynor: When to Use Which

Both **the Sharpe Ratio** and **the Treynor Ratio** are risk-adjusted performance measures designed to assess the efficiency of an investment in generating excess returns. However, they differ in their approach to measuring risk, and understanding **when to use each** is crucial for accurate performance evaluation.

#### Key Differences:

Feature	Sharpe Ratio	Treynor Ratio
Risk Measure	Total risk (standard deviation)	Systematic risk (Beta)
Appropriate For	Any portfolio	Well-diversified portfolios
Interpretation Focus	Return per unit of total volatility	Return per unit of market risk
Sensitivity To	Portfolio-specific fluctuations	Market-wide fluctuations

Sharpe Ratio Should be Utilized when Measuring Portfolios which are not fully diversified or have considerable Idiosyncratic Risk. Especially since it counts all types of volatility (total) as risk, which makes its coverage a lot broader.

- More applicable to well diversified portfolios which have eliminated un-systemic risk since Treynor Ratio represents systematic risk. Here, the systematic risk is major determinant of return variability and Beta should be the denominator.

#### Use Case Examples:

- Sharpe Ratio: Appropriate for assessing a start-up hedge fund or an actively managed portfolio with focused positions.
- Treynor Ratio: Excellent for analyzing large-cap index funds, pension accounts and ETFs with multiple holdings.

- **Applicability:** Applying the Sharpe Ratio to a diversified index fund can make performance look worse than it is, while applying the Treynor Ratio to an undiversified fund can make risk look like something other than what it is.

Also as per CAPM, Treynor holds that the only relevant risk is one - Beta. This is true under very simple theoretical assumptions which may not be satisfied in real markets. The Sharpe Ratio, on the other hand, views all volatility as meaningful (from whatever source) and may be more representative of those which are impacting the investor community.

In practice, the two ratios are often used in combination. And the comparison between these allows analysts to differentiate amongst

quality (Sharpe) and market efficiency (Treynor), capturing a more comprehensive view of performance.

### 8.2.4 Examples of Application in Real Portfolios

To understand the usefulness of the Treynor Ratio in implementation, one must see how it is used to evaluate portfolios, compare funds, allocate strategically and attribute performance. Given that it uses total risk, as opposed to just systematic risk, the Treynor is more appropriate for all institutional portfolios; which are presumed to be diversified premised in theory on efficient market research findings. In those circumstances, the critical issue becomes how much value (or excess return) each unit of market-risk charge delivers.

#### Example1: Performance of Mutual Fund Managers

Lets take three case studies of equity mutual funds (All are actively managed) A Fund, B Fund and C fund and their performance in a year with FY Returns -> When? & How Much? – Live Mutual Funds Analysis: Recently I was talking to one person who asked me why returns from equity mutual funds are not good for last ...

Fund	Return (%)	Risk-Free Rate (%)	Beta	Treynor Ratio
Fund A	14	4	1.2	8.33
Fund B	12	4	1.0	8.00
Fund C	11	4	0.7	10.00

Fund A would initially seem the most appealing, with its highest performance (14%). Nonetheless, the premium does offer increased market sensitivity meaning at least according to Beta of 1.2. After accounting for systemic risk, Fund C is the most efficient by far, providing

10.00 units of extra return per 1 unit of Beta brought to bear. This is what makes fund C interesting for institutional investors that are risk-aware and will rather focus on performance efficiency than purely raw return.

- Efficiency Trumps Size: A fund with lower but more efficient returns can still be preferable if it generates a higher return per unit of market risk. The Treynor Ratio reveals this subtlety.

This is relevant not only in regard to the choice of funds that a financial planner decides to use within his or her clients portfolios, but also for analysing.

managerial ability, especially when all the funds are hedged only against a common market index.

#### Example 2: Asset Allocation Analysis

For investment strategists constructing multi-asset portfolios, it is often a difficult task to allocate between asset classes which have dissimilar risk-return patterns. For example, shares, bonds, commodities and real estate investment trusts (REITs) all exhibit individual return dynamics and market sensitiveness.

It is possible to calculate the Treynor Ratio for individual asset classes, which would allow a strategist to determine which assets deliver the best return per unit of market risk. Suppose:

- 1.0% for stocks, 1.0% with a Beta-Omega Ratio of 0.5, and 6.
- Bonds have a yield of 6%, Beta = 0.2, Treynor Ratio = 10.0
- REITs return 9%, Beta = 0.8, Treynor Ratio = 6.25

In this case, bonds are the highest returning asset on a Beta basis even though they return much less in nominal terms. This would result an increased allocation to fixed income in lower volatility targeted portfolios or in period with anticipation of rising market risk.

- Allocation Based on Beta: Treynor Ratio helps in optimizing asset allocation by determining the most optimal level of systemic risk exposure within the asset group.

### Example 3: Fund-of-Funds Performance Attribution.

Fund-of-funds (FoF) managers have to assess and choose a set of external fund managers. One key question is whether a manager's returns come from skill in playing market conditions, or merely from swinging for the fences. In this case, the Treynor Ratio comes in handy.

Imagine Manager X vs. Manager Y, both of whom produce 13% annualized investment return, but:

- Manager X has a Beta of 1.5 → Treynor Ratio = 6.0
- Manager Y has a Beta of 0.9 → Treynor Ratio = 10.0

Yet they are not the same: Manager Y is more efficient, producing greater excess return on similar market opportunities. If I'm a FoF manager, that may influence me to put more asset in Manager Y (or justify higher compensation) because of this performance efficiency.

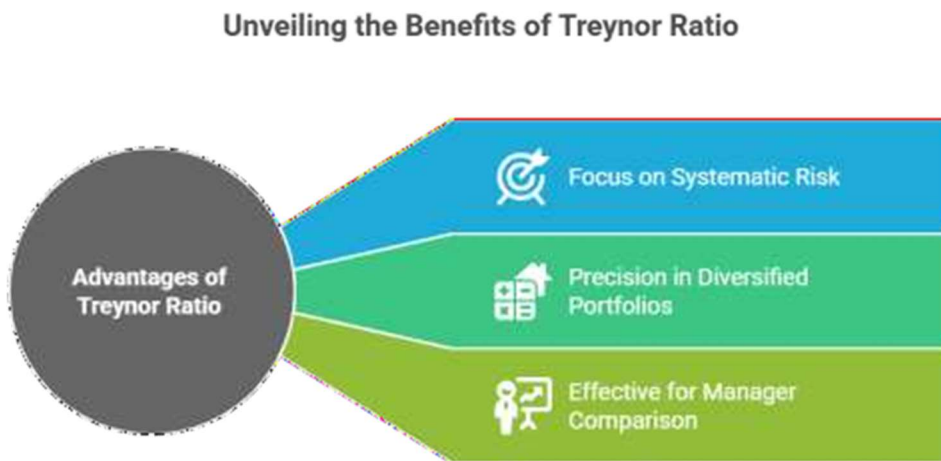
- Manager Benchmarking: The Treynor Ratio can distinguish high-beta risk taking from skillful return generation; particularly relevant in performance-based fee structures.

This point also highlights the significance of Treynor Ratio based fee discussions and compensation models, ensuring that investors pay for alpha and not just beta.

## 8.2.5 Treynor Ratio: Pros and Cons

The Treynor Ratio is a useful risk-adjusted performance measure, but it is based on a particular set of assumptions and is best utilized for some portfolio scenarios. It is important to appreciate its benefits and limitations in order to use it properly and not misinterpret analytical results.

### Advantages of Treynor Ratio



#### Focus on Systematic Risk

10 Unlike the Sharpe Ratio, which considers total risk (standard deviation), the Treynor Ratio only utilizes systematic risk, represented by Beta. This makes it more consistent with theoretical finance models, e.g. the CAPM model, which maintain that only market risk should be priced.

- CAPM Consistency: Because the Treynor Ratio is based on Beta it fits well in asset pricing theory and strategic asset allocation models.

#### Precision in Diversified Portfolios

25 In big portfolios — especially institutional ones — you continually diversify among many assets, sectors and regions. In these situations idiosyncratic (unsystematic) risk is small. The Treynor ratio is based exclusively on Beta, and so gives a less-complicated picture of return efficiency for these portfolios.

- **Noise Reduction:** By excluding firm-idiosyncratic volatility, the Treynor Ratio does not over-punish investments that perform well and are naturally more volatile due to concentration or innovation.

#### Effective for Manager Comparison

When we think about mutual fund and hedge fund managers operating under similar investment mandates, the Treynor Ratio offers a convenient measure to evaluate who is giving us more return per unit of market exposure.

- **Portfolio Objective Benchmarking:** Removes the return attributed to beta exposure from that generates by INSTANCE EXPOSURE COMPARED TO THE BENCHMARK p.

managing style, an important criterion for multi-manager portfolios.

#### Limitations of Treynor Ratio

##### Dependent on Beta Accuracy

Beta is not a static figure. It is generally based on historical analysis of regressions, and its precision depends on the overall health of the market. In times of market turmoil, for example, Beta can surge or plummet, giving false impressions about both risk and performance.

- **Estimation Risk:** (If) the Beta turns out to be false, the resulting Treynor Ratios are wrong, especially for portfolios with changing sector weights or trading strategies.

##### Ignores Total Risk

The idea that investors have already diversified away any idiosyncratic risk is the basis of the Treynor Ratio. But many real life portfolios, particularly those of retail or thematic investors, are not finely diversified. Thus, idiosyncratic risk can be overstated by ignoring it.

- **Blindness to Risk:** A high Treynor Ratio can create the impression of a strong performance, whereas actual investor experience may be higher due to firm-specific risks.

##### Not Suitable for Undiversified Portfolios

The Treynor Ratio less effective: For focused portfolios or strategies like activist investing, sector funds and venture capital, the utility of Treynor Ratio decreases. In these types of scenarios total volatility is what counts and the Sharpe more in line.

##### Assumes Linear Risk-Return Relationship

Treynor's Ratio is derived from CAPM's, a model based on the assumption that there is a linear relationship between risk (Beta) and return. Yet markets frequently do not behave linearly, a tendency that is further emphasized by liquidity shocks, non-normally distributed returns or regulatory turbulence.

- **Model Fragility:** Treynor based conclusions may be weakened or not valid if market assumption (like efficient market hypothesis or rational expectation) don't hold.

#### Limited Use in Non-Linear Instruments

Any options, leveraged ETF or structured product strategy is not simply a linear risk-return. When Beta is not a measure of true risk, the Treynor Ratio can be rather deceptive.

Example: An option strategy fund with low Beta but high downside exposure (like short puts) could have a high Treynor Ratio but be subject to significant tail risk.

- **Unobserved Risks:** As a ratio, the Treynor measures sensitivity to market risk and is silent about event risk, gap risk, or other forms of non-market-specific hazards; so in that sense it does poorly with alternative investments.

### “Activity: Measuring Return per Unit of Market Risk”

In this activity, students will be provided with return, Beta, and risk-free rate data for four different portfolios. Their task is to calculate the Treynor Ratio for each portfolio and rank them according to market risk efficiency. After computing the ratios, they must analyze the context: Which portfolio is most suitable for a diversified institutional investor? Which would be inappropriate for a retail investor seeking low risk? The exercise encourages understanding of Beta, systematic risk, and the proper application of the Treynor Ratio in performance assessment.

## 8.3 Jensen's Alpha and Sortino Ratio

In performance measurement, one issue is whether one can meaningfully distinguish between a manager's skill and the investment environment in which the manager operates. Traditional ratios such as Sharpe, Treynor, et cetera do a nice job of giving you some perspective, but fail miserably in capturing performance attribution nuance or investor focused definitions of risk. This is where Jensen's Alpha and Sortino Ratio comes into play.

The prevailing focus of Jensen's Alpha is whether a fund manager has the ability to generate returns in excess of that which can be explained by the conventional, theory devising Capital Asset Pricing Model (CAPM). Whereas the Sortino Ratio redefines risk to be just negative volatility (abandoning the idea that positive fluctuations are to be penalized). Together, these two metrics lend a dual perspective: one lens based on efficiency and skill, and another that reflects investor experience of risk.

### 8.3.1 Jensen's Alpha: Definition and Formula

**Jensen's Alpha** The concept of Jensen's Alpha was developed in 1968 by Michael C. Jensen when he conducted groundbreaking studies on the performance of Mutual Funds. His work was groundbreaking in that it questioned the assumption that managers always add value. He offered a systematic method for distinguishing between market-determined returns and skill-based returns, something that was vital to investors as they tried to determine if the active management fees were worth it.

Formula:

$$\alpha = R_p - [R_f + \beta_p (R_m - R_f)]$$

Where:

- $\alpha$  = Jensen's Alpha- the amount of excess performance
- $R_p$  = Portfolio return
- $R_f$  = Rate of return, Letter 'R' f = Fund (Zero risk investing benchmark for rate)
- $\beta_p$  = Portfolio's Beta, which measures the degree of systematic risk to which it is exposed.
- $R_m$  = Market return

In this equation, the component  $[R_f + \beta_p (R_m - R_f)]$  is the forecasted return by CAPM model. Alpha thus measures the degree to which the manager has outperformed (underperformed) expectations, net of some multiple of systematic risk.

- What it means: A **Positive Alpha** Indicates the manager **has outperformed** his **market** exposure; a **Negative Alpha** indicates inefficient risk Taking.

Numerical Example:

For example, if an equity mutual fund earns 15% return in a year. Risk-free rate is 3%, the Beta of fund is 1.2, and the market index return is 10%.

Expected return under CAPM =  $3 + 1.2 \times (10 - 3) = 11.4\%$

Jensen's Alpha =  $15 - 11.4 = 3.6\%$

In here, an Alpha of 3.6% means that the manager's strategies--like security selection, market timing or tactical allocation--adds returns beyond that which was explained by risk exposure alone.

Therefore, Jensen's Alpha is especially useful when evaluating active management techniques; for example, it helps to determine if a manager is just "riding the market" or genuinely outperforming.

### 8.3.2 Positive vs Negative Alpha: Interpretation

Alpha's real value is the interpretive clarity it provides. Unlike other measures, that needs some reference points, Alpha has a very simple interpretation: it is either positive (adding value), zero (not adding any value) or negative (destroying values).

## Positive Alpha

- It means that the manager produced returns in excess of CAPM.
- Represents either great stock-picking, dynamic sector rotation or timing the market.
- Whom it's for Active traders; Experienced investors or any investor using proprietary models.
- In practical terms, helps to support the rationale for higher management fees in actively managed funds.

## Negative Alpha

- Implies subpar results compared to the market exposure.
- Indicates by how much investors would have out/underperformed the market had they passively invested in a market index with an equivalent Beta.
- Sustained negative Alpha calls into question either the fund's approach, or costs, or management skill.

## Zero Alpha

- It tells us the portfolio return is perfectly what CAPM predicts.
- Implies that the portfolio moves like a passive index follower.
- Acceptable for index funds but disappointing for high-fee active funds.

### Illustrative Example:

Two managers operate funds with similar Betas of roughly 1.0. In a world without official Wall Street workers called analysts and traders, it's not clear whether that question could have been answered.

- Manager A Outperforms Model: Manager A earns 12% but the model says he should have earned 10% → Alpha = +2%.
- Manager B earns an 8% return, and the CAPM forecasts a 10% return → Alpha = -2% (value-destroying).

Thus, Alpha can act as an important parameter for fund assessment and retention.

### Did You Know?

"Only a small fraction of actively managed funds achieve persistent positive Alpha after accounting for management fees and transaction costs. Numerous empirical studies show that many managers fail to beat passive benchmarks over long horizons."

### 8.3.3 Sortino Ratio: Downside Deviation as Risk

The Sortino Ratio was developed from the recognition among investors that they do not view risk in a symmetrically way. The Sharpe Ratio lumps all risk together as bad, which is not how investors behave: who likes upside volatility? We'd rather have it a bit up than a little down (and my bag search clearly shows you haven't experienced much of that in the past three years). This ratio was created by Frank A. Sortino to account for investor objectives in risk measurements.

Formula:

$$\text{Sortino Ratio} = (R_p - R_f) / DD_p$$

Where:

- $R_p$  = Portfolio return
- $R_f$  = risk free rate / MAR (Minimum Acceptable Return)
- $DD_p$  = Downside deviation of returns

Downside deviation does not suffer from the same weakness as standard deviation due to consideration of returns less than MAR. It is obtained by squaring deviations from MAR for drawdowns, averaging them and then taking the square root.

- Selectivity of Volatility Measure: Since it removes the positive jumps, the Sortino Ratio covers exclusively undesirable risk.

Numerical Example:

For instance, imagine a portfolio that generates 12% average annual return and the risk-free rate is 4%. Standard deviation is 10%, but downside deviation (any return less than 4%) is a mere 6%.

- Sharpe Ratio =  $(12 - 4) / 10 = 0.8$
- Sortino Ratio =  $(12 - 4) / 6 = 1.33$

This example has demonstrated that Sharpe penalizes all volatility, however, Sortino credits the portfolio for upside-deviation, representing the portfolio in a better picture.

The Sortino Ratio is especially useful in evaluating funds with a non-normal distribution of returns (i.e. skewed results such as hedge funds, private equity, tail-risk hedges or option-writing strategies) where the accent is placed more on the downside risk.

#### 8.3.4 Sortino or Sharpe: Risk Based Empasis

While both ratios are theoretically related to one another, their divergent risk consideration produces ample headroom.

#### Sharpe Ratio

- Risk Definition: Total standard deviation.
- Strength: Straightforward and universally applicable.
- Weakness: It treats upside and downside volatility as equally costly.
- Application: Comparison of large variety of diversified portfolios, especially for those ones with approximately normal return distributions.

#### Sortino Ratio

- Risk Definition: Downside deviation only.
- Strength: More in harmony with behavioral finance, in which investors are more averse to losses than variability.
- Weakness: harder to calculate; dependent on choice of MAR.

- Use-Case : For portfolios with non-symmetrical construction (e.g., hedge funds, derivatives, income-focused funds).

#### Illustrative Example:

A leveraged hedge fund can generate strong positive deviations coupled with infrequent, but severe drops to the downside. The Sharpe Ratio would also appear with mediocre performance as it penalises volatility on both the upside and the downside. Sortino Ratio on the other hand, which would have placed a much greater importance to not lose and superior downside protection Needless to say.

- Investor-Driven Focus: For risk-averse investors, the Sortino Ratio might provide a better picture of how safe their portfolios are compared to the Sharpe Ratio.

#### 8.3.5 Application in Portfolio Evaluation and Fund Comparison

(Jensen,1968) and the Sortino Ratio are both commonly employed in performance measurement, portfolio selection, and manager evaluation but used from different angles of interest.

##### In Portfolio Evaluation

- Alpha tests if the returns are coming due to market risk or real skill. For pension funds, endowments and institutional clients, Alpha is essential if we're going to earn active management fees.
- Sortino looks to see if there are returns by the manager without unacceptable downside deviation for the investor. This is a crucial safeguard for them, insurance firms or retirees.

##### In Fund Comparison

- A positive Alpha and low Sortino portfolio may indicate a good manager willing to bear large amounts of downward risk.
- A low Alpha but high Sortino portfolio may indicate that you manage limited returns quite well, which could be useful for conservative mandates.

Example:

(You can go with the model to Concept Horizons I, but you would still get same diversity for Fund X and Alpha = +3%; Sortino = 1.1) (skillful for a volatile downside).

- Fund Y: Alpha = 0%, Sortino = 2.0 (no additional skill other than market, but strong protection from downside).

A Fund X would be what a growth investor is searching for, whereas if you are narrowly focused on risk preservation, well then a Fund Y may be more to your taste.

### Practical Integration

Professional investors seldom place their trust in a single metric. The PIC recognizes that Skill, Market Efficiency and Downside Safety need to be considered simultaneously when evaluating performance; a variety of approaches have been developed using multi-dimensional analyses such as the Alpha, Sortino, Sharpe and Treynor ratios.

- Institutional Practices: Endowments and pension funds often use Alpha in manager scorecards with Sortino being used for the analysis of absolute-return funds and retirement strategies where avoiding capital loss is a critical factor.

### 8.4 Beta and Its Use in Portfolio Performance

Of the several instruments utilised in modern portfolio management, Beta ( $\beta$ ) is perhaps the most well-known and widely-used measure of risk. It has taken a central place not only in analysis of Capital Asset Pricing Model (CAPM) but also in assessment of fund managers,

portfolio strategies and market exposure. Beta provides investors with a useful tool to determine how much a portfolio, or any given stock in the portfolio, will move as the broader market moves.

Unlike variance or standard deviation, which measure overall risk, Beta isolates the systematic component of risk - the part of a security's total risk that cannot be eliminated through diversification. This distinction is crucial for Beta when cleaning idiosyncratic risks (individual company or sector specific risks) from the inherent risks that investors cannot avoid when investing in financial markets.

Beta has long been incorporated into financial decision-making, yet its interpretation is nuanced. Not that Beta isn't useful, it's a powerful and yet flawed tool which investors tend to depend on too much as a one-dimensional metric. It is powerful in that it provides a direct connection of assets to the market, but also flawed since it operates based on historical figures and can fall short in light of evolving risks.

#### 8.4.1 Definition and Formula of Beta

Regulators currently use the measure, known as beta, to gauge how sensitive a company's returns are to those of the broader market. In simple terms, it tells us if and by how much an asset magnifies or softens the market's ups and downs.

Formula:

$$\beta = \text{Cov}(R_i, R_m) \div \text{Var}(R_m)$$

Where:

- $\text{Cov}(R_i, R_m)$  is the covariance of return on the asset and return on market.
- $\text{Var}(R_m)$  = Variance of the market's return.

This formula accounts for how much the asset co-moves with the market compared to just how volatile the market is.

Alternatively, in regression form:

$$R_i = \alpha + \beta R_m + \varepsilon$$

11 In the model,  $\beta$  is a slope coefficient that provides the percentage change in an asset's return associated with a 1% change in the market return.

4 •  $\beta = 1.0 \rightarrow$  the asset moves with the market.

•  $\beta > 1.0 \rightarrow$  asset is higher volatility than the market.

$\beta > 1, 0, 1$ : Aggressive Assets

8 Anything with Beta higher than 1 is aggressive as it swings more than the market.

• Example: If  $\beta = 1.4$  and the market increases by 10%, the asset is projected to increase by 14%. Alternatively, if the market goes down by 10% per cent, the asset may go down by 14%.

• Located in industries such as technology, consumer discretionary or small-cap stocks.

• These investments are appropriate for investors with growth-focused, risk-taking investment strategy.

Beta = 1: Neutral Assets

The Beta of 1 follows the market.

- Example: A S&P 500 index ETF will typically (on average over time) have  $\beta \approx 1$ .
- These are market-neutral- risk neither magnified nor dulled.
- Handouts that offer valuable benchmarks for assessing other portfolios.

Beta n?

This is essentially a market-matching portfolio.

### Strategic Diversification

- Aggressive Allocations: Mix high-Beta growth stocks (Beta  $\approx 2$ ) with Beta  $\approx 1$  to boost your efficiency.
- Defensive Mix: Add a few low-Beta or negative-Beta assets to lower volatility.
- Balanced Distribution: Target portfolio Beta of close to 1 as representative to moderate market exposure.

### Hedging Applications

- Investors to add low-Beta assets, such as bonds or alternative investments, for protection in a downturn.
- It is the importance of beta in calculating hedge ratios for derivatives contracts, to express market risk as yet an additional dose of neutralization of its influence.

- True Diversification: Unlike Beta that just averages risks, it is making certain portfolio behavior actually suits a client's specific risk tolerance and investment period.

#### 8.4.2 Beta > 1, < 1, = 1: Interpretation of Volatility

Assets that have Beta of more than 1 are considered to be aggressive as they move above the market.

- As an example, if  $\beta = 1.4$  and the market increases by 10%, we would expect the asset to increase by 14%. Conversely, if the market declines by 10%, the asset might decline by 14%.

- Are in sectors such as technology, consumer discretionary or small-cap stocks.

- These are growth-oriented investments for risk-tolerant investors.

#### Beta = 1: Neutral Assets

Securities' Beta = 1 follows the market trends.

- For example, an index ETF following the S&P 500 has  $\beta \approx 1$ .
- These expose you to moderate market risk, neither increasing nor decreasing volatility.
- Helpful benchmarks for comparing other portfolios.

#### Beta < 1: Defensive Assets

Anything with Beta of less than 1 is referred to as defensive, meaning that it moves less than the market.

- Example: A stock with  $\beta = 0.6$  increases by only 6% when the market increases by 10%, but decreases by only 6% when the market decreases by 10%.
- Typical of utilities, health care and consumer staples.
- Suitable for conservative investors with a bias toward capital preservation.

### Negative Beta Assets

There are also some very rare entities with negative Betas who move opposite the market.

- Such as: Gold, and some select hedging instruments tend to have slightly negative Betas.
- These are also hedges, safeguarding your portfolio when the market goes down.
- Food for thought: Beta is not carved in stone-the beta of your stock can, and probably does, vary (sometimes significantly) depending on changes in corporate cycles, sector trends or structural shifts.

#### 8.4.4 Beta in CAPM and Treynor Ratio

Beta is a fundamental building block of diversified portfolios in an attempt to balance opportunities for return with acceptable levels of risk.

#### Weighted Portfolio Beta

Beta of a portfolio is the weighted average of individual asset Betas:

$$\beta_p = \sum (w_i \times \beta_i)$$

Where  $w_i$  is the weight (percentage) of each asset in the portfolio. That gives managers the opportunity to fine-tune portfolios with respect to market sensitivity.

### Example:

- Stock A:  $\beta = 1.5$ ,  $w = 40\%$
- Stock B:  $\beta = 0.7$  and weight = 60%

$$\beta_p = (0.4 \times 1.5) + (0.6 \times 0.7) = 0.6 + 0.42 = 1.02$$

This portfolio is almost as marketlike as you can get.

### Strategic Diversification

- High Beta Portfolio: Mix of high-Beta growth stocks and  $\beta \approx 1$  so as to earn higher returns.
- Defensive Allocation: Add low-Beta or negative-Beta assets to reduce overall volatility.
- Bquil Weighting: Target portfolio Beta near 1 to represent market exposure at an average level.

### Hedging Applications

- Mine the markets for low-Beta assets, including bonds or alternative investments to cushion the downside.
- Beta is also important when constructing hedge ratios for derivative contracts that seek to be market-neutral (target beta = 0).

- Deep Insight: Meaning of beta as diversifier is not by simple averaging of risks, but by one that guarantees close alignment between portfolio behaviour and individual's risk aversion along with timeframe for investment.

#### 8.4.4 Beta in CAPM and Treynor Ratio

Theoretical models are the best guide to what beta means.

##### Beta in CAPM

CAPM defines expected return as:

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

- The model assumes that investors are compensated for systematic risk only (Beta).
- Higher Beta assets should also offer higher expected returns in line with their level of Beta.
- CAPM is very dependent on the use of Beta to connect Risk with required return.

Example:

If  $R_f = 3\%$ ,  $R_m = 9\%$  and  $\beta = 1.2$ , then:-

$$E(R_i) = 3 + 1.2 \times (9 - 3) = 10.2\%$$

##### Beta in Treynor Ratio

The denominator of Treynor Ratio is Beta:

Treynor Ratio =  $(R_p - R_f) \div \beta_p$  Where, Treynor Ratio = How much excess returns a fund has generated  $R_p$  = Portfolio Unlevered Return  $R_f$  = Risk Free Rate  $\beta_p$  = Portfolio Beta.

This ratio assesses if overperformance is actually justified given the systematic risk assumed. Unlike Sharpe, which is based on total volatility, Treynor emphasizes Beta – and nothing else.

- Real World Connection: The CAPM says what returns ought to be given a Beta; Treynor measures how well managers actually turn their Beta exposure into returns.

#### 8.4.5 Beta Limitations: Historical in nature; Market Sensitive

Beta is widely used, but it has certain limitations which need to be critically considered.

##### Historical Measure

Beta is computed with historical data. It works from the presumption that historical relationships between returns on assets and those of the market will persist, which is not always true.

- For example, a bank stock with an historically low Beta might jump to unprecedented levels in time of financial crisis.

##### Time-Varying Nature

Beta is not stable. It can change due to:

- Shifts in company leverage.
- Structural changes in industries.

- Broader macroeconomic shocks.

### Linear Relationship Assumption

Beta assumes returns are linearly related to the market. For non-linear securities such as options, Beta does not capture risk properly.

### Ignores Other Risks

Beta captures nothing but systematic (market) equity risk. It doesn't take into account liquidity risk, currency risk and credit risk—and these things can be just as large.

### Benchmark Sensitivity

Beta is benchmark dependent. The effect may be distorted by using an improper index.

- Example: determined beta of a multi-national company is with respect to domestic index overplays and disregards global exposures.
- Critical Insight: Beta should never be used alone but rather in relationship with other tools such as Alpha, Sharpe and Sortino Measures.

## Knowledge Check 1

Choose the correct option:

1. What does Beta measure?
  - a. Total risk
  - b. Systematic risk

- c. Credit risk
  - d. Liquidity risk
2. A stock with  $\beta = 0.6$  is considered:
- a. Aggressive
  - b. Neutral
  - c. Defensive
  - d. Negative asset
3. Portfolio Beta is calculated as:
- a. Simple sum of Betas
  - b. Weighted average of Betas
  - c. Regression residual
  - d. Average variance
4. In CAPM, Beta is used to calculate:
- a. Alpha
  - b. Expected return
  - c. Volatility
  - d. Downside deviation
5. One key limitation of Beta is that it is:
- a. Forward-looking
  - b. Always constant
  - c. Based on historical data
  - d. Free from market influence

## 8.5 Summary

⊖ Beta it is a measure of the sensitivity of assets or portfolio return to market returns and removes the unsystematic risk.

22 ⊖ If the Beta is greater than 1 the security's price is more sensitive compare to market and if it lower than 1.0 its cosidered as defensive stock.

1 ⊖ Beta of 1 means the asset moves in perfect synchronicity with the given market index, adding no additional risk.

⊖ Negative Beta are rare but these are asset which move in opposite direction to the market, so used as hedging products.

⊖ We can use the weighted asset Betas as part of our portfolio management through systematic risk exposure targeting at the portfolio level.

⊖ Beta is a fundamental concept in CAPM, where the systematic risk bears to the expected return.

⊖ Beta is in the denominator of Treynor Ratio by which it will calculate return efficiency with respect to market risk.

⊖ Beta is utilized in diversification strategies to adjust the aggressive balance and maxims of defensive for risk minimizing portfolio creation.

⊖ Beta is historical and may change because of changes in leverage, industry cycles or other macroeconomic shocks.

⊖ If  $\beta > 1$ , then the implication is that a BETA assume s a linear relationship between risk and return, when this may be an incorrect assumption for assets with non-linear cash flows (such as options).

⊖ Selection of a benchmark has a direct impact on Beta: proper market index must be chosen or risk analysis will get distorted.

⊖ Beta is helpful, however it must be used in conjunction with other measures like Sharpe, Sortino and Alpha for a complete evaluation of funds' performance.

## 8.6 Key Terms

Beta ( $\beta$ ) : Indicates sensitivity to changes in the market.

Systematic Risk A nondiversifiable risk associated with market-wide factors.

C: Unsystematic Risk: Specific to the firm And may be reduced through diversification.

Covariance: Extent to which returns of asset and market move together.

Market Variance: Spread of market return that is used in Beta for calculation.

Portfolio Beta: The average of all asset betas in a portfolio.

Aggressive Asset: An asset with a Beta greater than 1 that exaggerates market movements.

Defensive Asset: An asset with Beta less than 1, providing protection against any fluctuations in the market.

Negative-Gamma: Unusual to see, and not a useful measure.

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(CAPM): A model that explains expected return as a function of Beta and market premium.

Treynor The Risk-Adjusted Measure of Performance that is calculated as the excess return to Beta.

Sensitivity to Market: The extent to which an asset responds to changes in the market.

## 8.7 Descriptive Questions

Explain the significance of Beta and how it is calculated in terms of covariance and variance.

Explain the meaning of Beta when it is: more than 1 less than 1 equal to 1 negative

What role does Beta play in building diversification functions and selecting portfolio?

What is the role of Beta in CAPM when it comes to expected return? Provide a numerical example.

Distinguish between the Beta used in Sharpe Ratio and Treynor Ratio.

Critically discuss limitations of Beta as a measure of risk in today's financial markets.

How is the Beta of a portfolio different from the Beta of an individual asset? Explain with an example.

Explain how market conditions can cause Beta to change over the period.

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### Knowledge Check 1

1. c. Systematic risk
2. c. Defensive
3. b. Weighted average of Betas
4. b. Expected return
5. c. Based on historical data

## 8.9 Case Study:

### Background

Horizon Investments is a small-to-medium-sized institutional asset manager focusing on equity portfolios. (Horizon Dynamic Growth Fund) Old school, right? Well in this case "old" has returned over 5 years in a row of performing up to snuff with what we'd expect from performance typically found at the opposite "dynamic" end of the industry era. "But clients' risk concerns have increased in times of market risk aversion. A number of institutional investors are insisting on a more explicit description of how the fund controls systematic risk.

Portfolio manager risk To it, the on team is responsible for doing a full Beta analysis of program or any investor concerns. The analysis should also include the discussion of portfolio Beta, aggressive and defensive stocks, and how Beta relates to expected return in a CAPM world.

### Issue #1: Determining and Explaining the Value of Portfolio Beta

The portfolio consists of:

- Stock A ( $\beta = 1.4$ , Weight: 40%) •

Stock B ( $\beta = 0.8$ , weight 30%)

- Stock C ( $\beta = 0.6$ , weighting 30%)

Solution:

$$\text{Portfolio Beta } (\beta_p) = (0.4 \times 1.4) + (0.3 \times 0.8) + (0.3 \times 0.6)$$

$$= 0.56 + 0.24 + 0.18$$

$$= 0.98$$

Interpretation: Portfolio Beta is 0.98, so it is very close to the market. This indicates that the portfolio with high Beta growth stocks has an average market risk. Overall risk exposure is also controlled by diversification into low-Beta defensive stocks.

### Problem 2: Applying Beta in estimating the Expected Return (CAPM)

Assume:

- Risk-free rate ( $R_f$ ) = 3%
- Market return ( $R_m$ ) = 9%
- Portfolio Beta ( $\beta_p$ ) = 0.98

Solution:

The expected return =  $R_f + \beta_p (R_m - R_f)$  Keep in mind the Python interpreter uses the abbreviated variable names when evaluating an expression.

$$= 3 + 0.98 \times (9 - 3)$$

$$= 3 + 0.98 \times 6$$

$$= 3 + 5.88 = 8.88\%$$

Interpretation— Result under the CAPM is that expected return should be 8.88%. If the fund does indeed earn a higher return, the excess can be ascribed to active management ability (Alpha).

### Issue 3: Client Worry over Beta Constraints

Some customers insist that Beta is not enough because it does not forecast performance in a crisis like the pandemic crash of 2020.

Solution:

The firm acknowledges Beta's limitations:

- Historical Practice: Beta is a measure of price risk (volatility) that compares negatively correlated to the market.
- Sensitivity to Market: Beta varies with leverage, macro shocks and changes in sector.
- Factor 1: Beta disregards non-market risks (liquidity and credit).

The firm proposes complementary metrics:

- Sharpe Ratio to measure return per unit of total volatility.
- Sortino Ratio, which focuses on downside risk.
- Jensen's Alpha for evaluating the skill of the manager against CAPM expected performance.

When combined, Horizon is able to deliver a full performance story across Beta and beyond.

### Reflective Questions

What effect does diversification have on total portfolio Beta, and why is this also important for institutional investors?

Can clients use only Beta to evaluate the risk of their portfolios? Why or why not?

How does CAPM incorporate Beta in its return forecasts and what are the limitations for such application?

When would negative Beta assets be good additions to a portfolio?

What other performance factors should be combined with Beta to get a comprehensive portfolio analysis?

### Conclusion

The Horizon case also highlights the uses and abuses of Beta in portfolio analysis. On the one hand, Beta represents a dumb and human-friendly measurement for systematic risk which allows to communicate easily with clients about their portfolio and how it is exposed to market movements. Conversely, Beta is of limited value in isolation since it reflects only historical behavior and understates non-linearity or non-market risk.

From the Horizon standpoint, when Beta is combined with other supplemental models (eg Sharpe, Sortino and Jensen's Alpha) it creates additional confidence for clients that risk is actually being measured, managed and qualified. This unified method of evaluating risk and return suggests that the system at risk level is balanced, expected performance correlates according to CAMP principles, and the performance of primary action depending on market conditions but also due to active management.

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## Unit 9 Modern Portfolio Theories and Applications

### Learning Objectives

1. Understand the foundational principles of **modern portfolio theory (MPT)**, including **risk-return trade-offs** and **portfolio diversification**.
2. Analyze the role of variance, covariance, and correlation in constructing efficient investment portfolios.
3. Apply **the concept of the efficient frontier** to evaluate and select **optimal portfolio allocations**.
4. Examine **the Capital Asset Pricing Model (CAPM)** and its implications for asset pricing and expected returns.
5. Explore extensions and limitations of MPT, including assumptions and real-world challenges in portfolio management.
6. Utilize quantitative methods and models to assess portfolio performance and manage investment risk.
7. Evaluate the practical applications of portfolio theory in contemporary financial markets, including asset allocation and risk management strategies.

### Content

- 9.0 Introductory Caselet
- 9.1 **Capital Asset Pricing Model (CAPM)**
- 9.2 **Arbitrage Pricing Theory (APT) & Multi-Factor Models**
- 9.3 Efficient Market Frontier & MPT
- 9.4 Portfolio Risk Measurement
- 9.5 Summary
- 9.6 Key Terms
- 9.7 Descriptive Questions
- 9.8 References

## 9.9 Case Study

### 9.0 Introductory Caselet

#### Context:

Our approach Global Asset Managers Ltd.—a mid-sized investment manager—has a strong reputation for designing well-diversified, allowing inflation-related considerations to guideline-based portfolios that seek to meet its clients' long-term objectives. Historically, the firm has used modern portfolio theory (MPT) to structure portfolios that seek to minimize risk while maximizing expected return. The company's customer base consists of conservative investors focused on capital preservation, and aggressive investors who seek higher returns on investment.

#### The Challenge:

Financial markets were jostled in 2023 by inflation, interest rates and geopolitical conditions around the world. Equities became volatile, government bond yields unexpectedly rose and commodities and other alternatives took on a new-found importance. This situation caused Global Asset Managers Ltd to rethink its approach.

The CIO suggested that the firm consider reevaluating their asset allocation using principles of MPT, and in particular the efficient frontier to find portfolios that balance risks versus returns. But some on the team also were uneasy that MPT's underlying assumptions, for example about stable correlations and rational investor behavior, as well as having risk measures that forecast well into the future, may not be taking into account real-world dynamics in being that predictably range-bound—or able to make reliable bets—in such uncertain times.

#### The Dilemma:

There were two different ways of looking at the investment committee:

The Defensive Route: Increase the weighting of the portfolio toward lower-risk government securities and blue chips, keeping money safe for clients.

Offensive: Overweight EM equities and tech, high expected return (also very high volatility and down)

The firm had to figure out how to incorporate modern portfolio theory with up-to-the-minute market changes, human behavior and client needs.

Implications:

Underlying the case was an important tension in portfolio management: though theoretical approaches such as MPT offered a systematic approach to decision, the uncertain dynamics of global 970 dimensions.

flexibility and judgment. Quant models alone may make portfolios too fragile to surprise shocks, but if we ignore MPT there's a strong likelihood excess risk will be taken relative to their utility.

Critical Thinking Question:

Why Investment Firms Use only Modern Portfolio Theory in Creating Portfolios, given the moral hazard arising from the way Global Capital Markets can become dysfunctional and irrational, Shouldn't they have supplementary basis beyond qualitative perspectives? Describe the benefits and limitations of each viewpoint.

### 9.1 Capital Asset Pricing Model (CAPM)

With reference to the relationship between systematic risk and the expected return on assets, the Capital Asset Pricing Model (CAPM) is one of cornerstones of present financial theory. It allows investors to assess if an investment is priced appropriately through relative to the risk

free rate and market risk premium (and given investment characteristics, company specific - usually the Beta).'

### 9.1.1 Concept and Assumptions of CAPM

The Capital Asset Pricing Model (CAPM) is one of the most central models in finance today. It's an evolution of the Modern Portfolio Theory (MPT) that is all about not having all your eggs in one basket. The Perfect Market Model (CAPM) takes this concept a step further and expresses the relationship between the expected return on an asset and its risk (the non-diversifiable component). This is a form of risk referred to as "systematic" risk. According to CAPM, the proper compensation for taking on risk is only for that risk which cannot be diversified away i.e. unsystematic or firm-specific risk.

Mid: The central concept of CAPM is investors demand two types of compensation for holding risky assets. The first is the risk-free interest, which accounts for time value of money. The second risk factor is the risk premium, which is determined by the quantity of systematic risk borne by the asset. It means that the CAPM can be viewed as a linear model relating expected return to risk.

The model relies on a series of theoretical assumptions that abstract from reality and help to obtain analytical clarity. Although such assumptions are frequently criticized as unrealistic, they are part and parcel of the model's structure.

- Rational and Risk-Averse Investors:

Assumptions — Of course, not all investors are rational and will be blind followers of whatever CRAPM may dictate to them. CAPM assumes that all investors are rational—where “rational” means maximizing wealth by accepting the trade-off between risk and return. They are also risk averse, and prefer less risky portfolios when the returns of two portfolios are the same. That's what keeps the markets from getting disordered or unpredictable.

- Existence of a Risk-Free Asset:

Investors have the ability to lend or borrow an unlimited amount at the risk free rate of return, typically expressed by government bonds or treasury bills. This enables them to tailor the composition of their portfolio (take risky and riskless assets as examples) in order to match their preferred return-risk profile.

- Perfect Capital Markets:

The model does not take into account taxes, transaction costs or limitations on short sales. These assets are infinitely divisible, and everyone has the same access to full and accurate information. This is to ensure the efficient operation of markets and that securities are priced fairly.

- Homogeneous Expectations:

It is considered that investors have common knowledge of the expected returns, risk and correlations of securities. This equilibrium condition ensures that all investors come to the same conclusion regarding their beliefs about asset prices and stock the exact same market portfolio, levered or de-levered at the risk-free rate.

- Single-Period Horizon:

CAPM assumes that the shareholders look at investment horizon during any given single period, say one year. This model is reduced and eliminates the complexity of multi-period investment horizon, prompting estimation of time varying risk return expectations.

These are simplifying assumptions, which of course do not reflect reality but restrict the model's realm of validity. In practice, markets have taxes, transactions costs, and investors who hold different expectations. Behavioural biases also challenge the rational investor hypothesis. However, CAPM is still employed in practice as it represents an intuitive and elegant approach to explaining the risk-return relation.

9.1.2 Formulae:  $E(R_i) = R_f + \beta_i (R_m - R_f)$

This CAPM formula is used to determine the correlation between risk and gains:

Formula:

5  $E(R_i) = R_f + \beta_i (R_m - R_f)$  E(R Return on asset is the return of security i, RhS =RET and SM Return = Ritima.

•  $E(R_i)$ : The anticipated return on asset i

12 •  $R_f$ : Risk-free rate of return

•  $R_m$ : Market portfolio rate of return

•  $\beta_i$  Beta of asset i

•  $(R_m - R_f)$ : Premium for market risk.

2 This equation demonstrates that the expected return on an asset is the risk-free rate plus a risk premium. The premium is measured by multiplying the asset's beta with the market risk premia.

• Risk-Free Rate ( $R_f$ ):

The amount of return a person can receive without taking any risk, such as with government securities. It is a compensation for the time value of money.

• Risk Premium on the Market ( $R_m - R_f$ ):

45 The extra return that is expected to be earned on the market portfolio over the risk free rate. It represents the payoff for bearing systematic risk.

- Beta ( $\beta_i$ ):

The extent to which an asset is responsive to dynamic changes in the general market. A beta over 1 denotes risk and return potential that is higher in comparison with the market, whereas a beta lower than 1 denotes risk and return that are lesser.

Example:

Example If  $R_f = 4\%$  and  $R_m = 12\%$ ,  $\beta_i = 1.3$ :

25 
$$E(R_i) = 4\% + 1.3 \times (12\% - 4\%)$$

$$E(R_i) = 4\% + 1.3 \times 8\%$$

$$E(R_i) = 14.4\%$$

This is what the asset is expected to return. 14.4%. If the actual return is greater, then it indicates that the asset may be undervalued and a lower actual return suggests overvaluation.

It is an equally popular formula for equity valuation and used by various analysts to calculate the cost of capital, portfolio management or any situation related to it. But it depends too much on accuracy of inputs, which can change with the passage of time or between markets.

### 9.1.3 Role of Beta in Expected Return Estimation

7 Beta ( $\beta$ ) plays a vital role in CAPM by representing the amount of systematic risk an asset adds to a portfolio. It measures the sensitivity of an asset's returns to overall market movements.

Formula for **Beta**:

$\beta_i = \text{Cov}(R_i, R_m) \div \text{Var}(R_m)$  Define:

- $\text{Cov}(R_i, R_m)$ : Asset returns' covariance with market returns
- $\text{Var}(R_m)$ : Variance of market returns

This equation demonstrates that beta quantifies how an asset moves **with the market**.

- **$\beta = 1$ :**

This **asset moves** directly **in** concert **with the market**. It rises by 5% if the market rises by 5%.

- $\beta > 1$ :

The asset is the more volatile of the pair. The asset may also rise by 7% or even higher if the market goes up by 5%. Assets such as these are more risky and also have higher expected return.

- **$\beta < 1$ :**

The asset has **less volatility than the market**. If the **market** goes up 5%, **the** investment may only go up 3%. These assets are defensive and attract risk-averse investors.

- **$\beta < 0$ :**

49 The asset moves inversely to the market. Gold, for instance, often has a negative beta — rising when the stock market drops.

For expected return estimation, beta is a direct player. The greater beta would increase expected return in CAPM as investors need more risk premium for higher systematic risks. For instance, two stocks with betas of

Having values of 0.8 and 1.5, they will bring large discrepancy for expected returns taking into the CAPM formula.

Beta is a commonly used approximately, but it has drawbacks. It is derived from historical data, and therefore may not accurately reflect current prices or future inventory availability. Furthermore, Beta is an assumption for a linear impact on market returns, which may be false in extreme situations. Despite the limitations, beta continues to be an important method for assessing trade-offs of risk and return.

#### 9.1.4 Security Market Line (SML) and Interpretation

1 The SML is a graphical representation of CAPM. It plots the expected return of an asset against its beta, serving as a method to ascertain if securities based on risk are appropriately priced.

Equation of SML:

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

- X-axis: Represents beta (systematic risk).
- Y-axis: Represents expected return.
- Intercept: The risk-free rate,  $R_f$ .

- Marginal cost of capital: Dividend value per share/market price per share + slope ( $R_m - R_f$ ) where market risk is expressed as it was mentioned above.

SML: A visual mechanism for examining the risk-reliant relationship in terms of the return.

- Fairly Priced Securities:

Any asset on the SML is said to be priced fairly, because its return coincides with its systematic risk.

- Undervalued Securities:

Assets that fall above the SML are yielding a rate of return in excess of their risk level, and represent under-valued assets which investors may see as particularly attractive.

- Overvalued Securities:

Assets beneath the SML imply lower than expected returns given their level of risk, meaning they are overpriced and unappealing.

SML is also important because it holds for assets and not only individual securities but portfolios. It provides a benchmark against which to measure the performance of the investment, and to assess its return versus risk.

Nonetheless, the success of SML is based on the assumptions of the inputs in CAPM model. Estimating beta, the expected market return and the risk-free rate could be difficult. Differences in realised returns from SML also resulted in the construction of the alternative models such as APT (Arbitrage Pricing Theory).

#### 9.1.5 Strengths and Limitations of CAPM

CAPM has been celebrated for its simplicity, and condemned for its assumptions. It continues to be one of the most taught and used models in finance.

Strength: Simplicity and Clarity:

CAPM simplifies the multivariate risk and return equations which describe complex relationships among investors preferences into a simple cutoff POSITIVE LINEAR FUNCTION. It's simple to use and easy to understand, which is why it became a favorite of both investors and academics.

Strength: Benchmarking Capability:

CAPM sets a level for asset pricing. Investor has the advantage of comparing these actual rates of return with CAPM-estimated returns and he can recognize either under or over-valued securities that facilitates investment decisions.

Strength: Distinguishes Systematic Risk:

CAPM focuses only on systematic risk as it is the only risk that investors are compensated for in a diversified portfolio. This conceptual distinction allows us to concentrate at the risks that really take place in financial markets.

Limitation: Unrealistic Assumptions:

CAPM is based on the assumption of perfect markets, rational investors and a risk-free borrowing and lending rate. In reality, taxes, expenses, irrationality and information asymmetry exist in markets so we will not work with that.

Limitation: Input Estimation Problems:

Beta, expected market return and risk free rate are all estimates in CAPM. These estimates may be unreliable or unstable.

Limitation: Empirical Weakness:

Real world data generally do not correspond with predictions of CAPM. For example, small-cap and value stocks earn returns above those predicted by CAPM, which yeast roles in **the development of multi-factor models** such as **the Fama-French model**.

Limitations **and** all, **CAPM** is a bedrock of finance due to its intuitiveness and simplicity of application. It is the floor for assets pricing, cost capital calculation and portfolio analysis despite more sophisticated models being used in addition to it.

### “Activity: Evaluating Securities Using CAPM and SML”

In this activity, students will analyze three hypothetical stocks with different beta values and compare their expected returns using the CAPM formula. They will then plot these securities on a Security Market Line diagram to determine whether they are overvalued, undervalued, or fairly priced. This exercise encourages application of CAPM in a practical setting, while also prompting students to critically evaluate the limitations of relying solely on beta and expected return. Through group discussion, students will refine their understanding of the risk-return trade-off.

## 9.2 Arbitrage Pricing Theory (APT) & Multifactor Models

Alternative to CAPM and APT are **Arbitrage Pricing Theory (APT) and Multi-factor Models**. Whereas **CAPM is based on** just one factor (**the** market portfolio), APT factors in multiple economic and financial factors which may affect the returns of assets. This model considers macroeconomic indicators such as inflation rate, interest rates, and industrial production and

company-specific factors. APT's flexibility and multi-factor generalizations make it a useful tool to describe return variations in securities and to uncover arbitrage opportunities when these diverge from their fundamental values.

### 9.2.1 Concept and Assumptions of APT

In 1976, Stephen Ross proposed an alternative to the capital asset pricing model (CAPM), the Arbitrage Pricing Theory (APT). Unlike CAPM which is based on single systematic risk factor, the market portfolio, APT recognizes that asset returns are also affected by other such factors. These can range from macroeconomic factors, through industry dynamics, to firm characteristics. APT presents a less rigid, more realistic setting in that it accommodates the force of more than one risk factor (as opposed to being limited to a single risk factor).

At the heart of APT is that a return for any asset can be expressed as a linear combination, weighted by sensitivity factor coefficients, of different risk factors. Inspired by the lines of research just reviewed, in this model the return on an asset does not depend on a single measure of risk, but rather on exposure to several sources of systematic risk.

General APT Equation:

$E(R_i) = R_f + \beta_1 F_1 + \beta_2 F_2 + \dots + \beta_n F_n$  Formulas:

- $E(R_i)$ : The expected return on asset  $i$
- $R_f$ : Risk-free rate
- $\beta_1, \beta_2, \dots, \beta_n$ : Sensitivity of the instrument to each factor of risk
- $F_1, F_2, \dots, F_n$ : [ Risk premium on each factor\_rsp ]

23 We can see from equation that the Expected Return of an asset is the risk-free rate plus different factor premia.

Core Assumptions of APT:

- No Arbitrage Principle:

APT allows all arbitrage opportunities (where trade based on mispricing can generate profits with zero risk) in efficient markets to be eliminated extremely quickly. When securities deviate from their equilibrium fair value in the market, arbitrageurs emerge to correct the price.

- Linear Relationship:

Asset returns are hypothesized to be linearly related to several risk factors. The expected return is a linear function of all factors and their respective sensitivities.

- Diversification Eliminates Idiosyncratic Risk:

7 Same as CAPM, APT assumes that investors can hold diversified portfolios where unsystematic (idiosyncratic) risk is washed out. The only relevant factors now are the systematic ones that explain returns of assets.

- Factor-Specific Influence:

4 The model is based on the assumption that each factor is related to a separate and observable influence upon asset returns; this means it enables analysts to tie returns directly to particular economic or financial factors.

- Risk-Free Borrowing and Lending:

As with CAPM, the availability of a risk-free security is assumed to offer a minimum level of return.

The flexibility of APT is that it does not restrict the number of factors that must be in the model. Which enables researchers or policy makers to validate such model in different periods and contexts, selecting appropriate macroeconomic/financial variables. But this very power creates a problem: Factors are hard to find and difficult to measure.

### 9.2.2 Comparison with CAPM: Single vs Multi-Factor

The key difference between the CAPM and APT is the number of factors used in calculating asset returns. CAPM limits itself to a single factor (i.e. market portfolio systematic risk), whereas APT can consider several risk factors, what makes the financial markets environment more realistic.

- CAPM: Single-Factor Approach

CAPM's equation is:

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

Here, expected return is also dependent on only one factor: market risk. The beta coefficient quantifies the extent to which the

asset responds to market fluctuations. Drury: The simplicity of CAPM is also its attraction, but it also does not take into account other factors such as inflation, interest rates or changes in the global economy.

- APT: Multi-Factor Approach

APT's formula is:

$$E(R_i) = R_f + \beta_1 F_1 + \beta_2 F_2 + \dots + \beta_n F_n \text{ Also written as } R_i = R_f + \sum_{i=1}^n (\beta_i F_i)$$

In this model, returns are linked to several macroeconomic and financial variables. Every factor makes a unique incremental contribution and the sensitivity of an asset to each factor is quantified by its response coefficients. This makes it also possible to form a more subtle perception of risk and return.

#### Key Comparative Points:

- **Simplicity vs Flexibility:**

The CAPM is elegant, based on a single factor, but overly constricting. APT is very flexible, in the sense that it allows many factors to be considered by adding them as an extra term, but care must be taken when picking and estimating such additional terms.

- **Practical Application:**

CAPM is simple to use and there is much research using this model in cost of equity. APT, although stronger in theory, is more convoluted here because the elements are not explicitly defined.

- **Predictive Power:**

CAPM is known to fail in cases of the anomalies such as size and value effects. APT has more explanatory power for differences in portfolio returns, since it involves many variables.

- **Underlying Assumptions:**

CAPM assumes sameness of investor expectations and market Efficiency. APT concerns about the no-arbitrage condition and makes less assumptions of the investors' behavior.

While CAPM is a model of relative simplicity, the APT model aims at depth and flexibility. Practitioners and academics often choose to apply APT or its derivatives while analyzing the complicated markets with multi risk drivers.

### 9.2.3 Common Factors: Inflation, Interest Rates, Market Indices

APT doesn't prescribe what factors should be in its model, it's left to researchers and practitioners. Nonetheless, there are some macroeconomic and financial factors that are commonly found as important determinants of asset returns.

- Inflation:

Inflation erodes the value of money and has a direct impact on assets. High inflation undermines real returns, raises input costs for companies and creates financial markets uncertainty. In the APT, inflation is considered as a risk factor because unanticipated changes in inflation can affect future cash flows and thus discount rates.

- Interest Rates:

Interest rates have an effect on how much it costs to borrow, as well as on consumers' spending and companies' investment. When rates are in the rise, bond yields generally go up as well, which can put downward pressure on equity valuations. Conversely, falling yields make stocks more valuable. Interest rates also play a role in investor preferences, thereby they are an essential part of asset pricing models.

- Market Indices:

General market indexes are a gauge of the overall performance of an industry and investor attitude. Whereas CAPM relies only on the market portfolio as a factor, APT frequently consists of indices and factors along with the market-wide effects.

- Industrial Production:

Increases in industrial production can indicate economic expansion and stronger corporate earnings, while decreases can signal that an economy's rate of growth is slowing. As a macroeconomic variable, it often becomes one of the factors to model the economic cycle behavior.

- Exchange Rates:

Changes in the value of money can be a huge driver of profit for worldwide trading businesses. Interest rates and exchange rates are frequently used in multifactor models, particularly when dealing with a globally integrated economy.

- Commodity Prices:

Resource-based sectors are vulnerable to the changes in commodity prices such as oil and metals that impact both costs and revenues. These are generally accounted for when forecasting returns in industries such as energy, minerals or manufacturing.

By including these exogenous variables, the APT has a feature that considers the cross-sectional dependence on others factors for asset return. The selection of factors is based on the economic environment, horizon period and a consideration of the market under analysis. This flexibility increases APT's explicative capacity at the cost of complicating factor identification.

#### 9.2.4 Factor Sensitivity and Arbitrage Opportunity

One of the important feature of APT is factor sensitivities, which signal how much an asset responds to return changes due to particular risk factors. Each factor has its sensitivity measure ( $\beta$ ) that demonstrates how the returns of the asset are influenced by changes in each factor.

For instance, if a stock has 0.7  $\beta$  for inflation then 1% unexpected rise in inflation leads to a 0.7% impact on the return of the asset. This sensitivity enables investors to assess how much an asset is exposed to the various sources of the systematic risk.

Sensitivity to factors is crucial for factor arbitrage identification. Investments in securities should, in theory, deliver a return commensurate with their factor exposures. If they are not, mispricings will emerge and leave room for arbitrage.

- Arbitrage Defined:

Arbitrage is the purchase or sale of a stock under two different markets in order to profit from price disparities. In the context of APT, arbitrage happens when a security's realized return does not correspond to its expected return as indicated by its factor sensitivities.

- Arbitrage in APT:

Let's say we have 2 assets with the same factor sensitivities, but different returns. Investors can short the overvalued asset and go long in an undervalued asset, generating "riskless" profit. These type of transactions persist until the market corrects itself to eliminate the mispricing and return it towards equilibrium.

- Importance of Factor Sensitivity:

Factor sensitivities help portfolio managers to control their exposure to systemic risk drivers. For instance, pulling back on exposure to interest-rate-sensitive assets when rates are climbing can help preserve portfolio performance.

Arbitrage means that markets are efficient and prices reflect fair value. Thus the no-arbitrage condition is at the heart of APT, guaranteeing that risk factors and their expected returns are consistent. Arbitrage can not necessarily eliminate mispricing completely, in real markets transaction costs and market imperfections tend to keep away them from having full effect, but the model has gained much attention.

### 9.2.5 Application in Portfolio Construction

APT and multi-factor models are extremely useful in the exercise of framing portfolios. Because they simultaneously capture various factors that affect returns, investors are able to construct diversified portfolios according to their risk attitudes and economic views.

In reality portfolio managers conduct factor analysis to gauge the sensitivity of assets to various macroeconomic factors. So, if a portfolio is very rate sensitive, then managers may reduce their exposure by reallocating to areas of the curve that are less affected by changes in rates. Conversely, if inflation is anticipated to increase, investments can be reallocated to assets that have historically fared well during periods of inflation e.g. commodities or real estate.

Key applications include:

- Risk Management:

It provides investors with the possibility to measure exposures for various risks and adjust portfolios accordingly. Diversification is aided by spreading sensitivities over factors.

- Performance Attribution:

Portfolio returns can be broken down to contributions of the different risk factors. This assists managers in determining whether returns are generated through skill or macroeconomic exposure.

- Hedging Strategies:

Through understanding factor sensitivities, investments can be hedged against negative changes in the economic environment. Derivatives, for instance, can hedge exposure to interest rates or foreign exchange risk.

- Enhanced Diversification:

multi-factor models point to the need to invest in assets that are sensitive to different risks so as not have portfolios concentrated on any single source of risk.

At the same time, APT offers a flexible and sound method for portfolio formation. Unlike CAPM which takes only market risk into consideration, APT considers variety of factors involved in risks and thereby helps to make portfolio returns resistance under different economic environments.

### Did You Know?

“Arbitrage Pricing Theory is not limited to academic use—it forms the foundation of many hedge fund and quantitative investment strategies. By analyzing factor sensitivities, fund managers actively exploit

mispricing opportunities and construct portfolios that aim to outperform benchmarks while maintaining controlled exposure to systematic risks.”

## 9.3 Efficient Market Frontier & Modern Portfolio Theory (MPT)

The combination of The Efficient Market Frontier and Modern Portfolio Theory (MPT) together are the theoretical basis for investment today. MPT, first surmised by Harry Markowitz in the 1950s provided a logical perspective with which to 'view' portfolios rather than examining securities piecemeal. The efficient frontier demonstrates how rational investors are able to achieve higher expected returns given a set level of risk, by diversifying across assets. With measures such as covariance, correlation and optimization, MPT explains how investors can construct an efficient frontier (or set of optimal portfolios) using the markowitz portfolio selection model. The efficient frontier demonstrates the trade-off between risk and expected return, and preferences for different investors are introduced using indifference curves to show their best portfolio.

### 9.3.1 Introduction to Modern Portfolio Theory (Markowitz)

Before Harry Markowitz changed everything, most investors felt the best approach was to select individual securities with highest expected return or lowest risk. But, such an approach overlooked how these securities behave in relation to one another when put together in a

portfolio. Markowitz turned attention to portfolio construction, demonstrating that investment returns depend not just on the properties of individual investments but also on their interactions.

3 The expected return of a portfolio is the weighted average of the expected returns on its individual consumable assets. This can be expressed as:

$$E(R_p) = w_1 E(R_1) + w_2 E(R_2) + \dots + w_n E(R_n)$$

8 The weights ( $w_i$ ) characterize in which proportion one invests his/her money across assets. While return is easy to calculate, risk is not. The variance or standard deviation of returns to a portfolio is interpreted as the portfolio risk, which is not based only on individual variances but also on the co-movements among assets.

When we have a two asset portfolio, risk becomes:

$$\sigma_p^2 = w_1^2 \sigma_1^2 + w_2^2 \sigma_2^2 + 2w_1 w_2 \sigma_1 \sigma_2 \rho_{12}$$

10 The crucial point realised by Markowitz was that correlation ( $\rho_{12}$ ) determines the extent of diversification. If the two assets are perfectly correlated ( $\rho = +1$ ), then diversification is of no use. If the correlation is less than +1, lower the portfolio risk. When the correlation is negative, too, there is no risk; ————Risk reducing to its maximum level can occur.

In Conclusion, MPT delivers three key learnings:

- Risk must be assessed at the portfolio, not just the asset level.
- Through diversification the nonsystematic risk is cancelled leaving only systemic one.
- Rational investors are concerned with achieving the appropriate trade-off between risk and return.

Markowitz's work became the cornerstone of contemporary finance and embodied vast literature that followed, alongside with CAPM, APT as well behavioral portfolio theory. It turned investing from an art to a science by applying mathematical models and optimization methods.

### 9.3.2 Concept of Efficient Frontier: Risk-Return Optimization

**The concept of the efficient frontier is a** cornerstone **of** MPT. It's the collection of portfolios which yield as much expected return, as possible for every level of risk (alternatively: minimize levels of risk for any expected amount of return). Generated from a generalized spreadsheet that lists many possible combinations of risk and return in which investments might be made, it takes the shape of an upward-sloping concave curve.

The efficient frontier arises from the observation that an arbitrary portfolio of assets cannot be desirable, as you can form a better strategy. Portfolios inside of the frontier are inefficient; there is an alternative portfolio that provides a higher return for risk borne. Portfolios above the frontier are infeasible because they would entail returns that exceed what is possible in the capital market. Efficient portfolios lie only on the frontier.

Important components include:

- **Minimum Variance Portfolio (MVP):** The portfolio that bears **least risk.** And while it may be safe, it may provide less returns.
- **Feasible Portfolios:** These are efficient portfolios on the top "frontier" of trade-offs between risk and return.
- **Ineffective Portfolios:** Portfolios that lay below the efficient frontier and that will rationally be passed over by investors.

The efficient frontier is evidence that diversification leads to better results. By mixing assets with less-than-perfect correlations, you can lower volatility (without lowering returns). For

instance a mix of equities and bonds often falls on the frontier because equities generate higher returns but are more volatile and bonds less so.

Optimising its risk-return refers to the investor's responsibility about how much risk they are prepared to accept for extra returns. The efficient frontier reveals this trade-off for rational decision making. For conservative investors,

portfolios near the MVP are good. More aggressive investors might prefer higher risk and a potentially higher return.

The efficient frontier, therefore represents a road map of available investment options for an investor to choose from in order to achieve the most desirable portfolio based on their criteria and preferred level of efficiency.

### 9.3.3 Optimal Portfolio and Investor Indifference Curves

Although the efficient frontier indicates what are the best portfolios available out there, it does not tell us which portfolio any given investor should pick. The choice is on the basis of investor preferences, demonstrated by indifference curves.

Indifference curves are combinations of risk and return that give an investor equal satisfaction, or utility. They slope upward because investors need to be paid more to take on more risk. They are convex because preferences become more risk averse when risks are higher ~investors have to achieve more and more returns to accept the same amount of risk!

The efficient frontier is the tangent point between an investor's indifference curve and the optimal portfolio. This point of tangency maximizes utility by providing the highest possible return for a given level of risk that the investor is prepared to take.

Key implications include:

- People Averse to Risk: Their indifference curves are very steep, indicating aversion to a large amount of risk. Their best performing portfolios get now near the minimum variance portfolio.

48 • Moderate Risk Preference: An investor who is risk averse and has moderate risk preferences picks one of the portfolios in the center of the efficient frontier.

• Risk-loving investors: They have flatter indifference curves and they are of higher risk types. They choose high-return, high-risk portfolios.

MPT personalizes portfolio construction by using objective market opportunities (efficient frontier) that are tempered with subjective preferences (indifference curves). This makes for truly efficient portfolios – even two investors with access to the same set of efficient portfolios may choose different ones, based on their risk tolerance and return requirement.

Such linkage of market data to human psychology makes the notion of efficient portfolios one of the most applied implications or contributions of MPT.

#### 9.3.4 Role of Correlation and Diversification

8 Diversification spreading your assets among a variety of investments also helps limit risk. How well diversification works depends on correlation, the degree to which two assets move in relation to each other. The  $-1 \leq \rho < 0$  and  $0 < \rho \leq +1$ .

42 • Fully Positive Correlation ( $\rho = +1$ ): The assets have a perfect positive correlation and move together. Diversification provides no risk reduction.

• No Correlation ( $\rho = 0$ ): Assets do not move at all related to each other. Through diversification, serious risks are minimized.

• Perfect Negative Relationship ( $\rho = -1$ ): Assets move in opposite direction. By Diversification, the entire risk of a portfolio can be eliminated, just in theory.

The portfolio variance demonstrates how correlation comes into play:

$$\sigma^2 = w_1^2\sigma_1^2 + w_2^2\sigma_2^2 + 2w_1w_2\sigma_1\sigma_2\rho_{12}..$$

The coefficient of correlation ( $\rho_{12}$ ) indicates whether diversification attenuates or magnifies risk. Less correlation reflects less overall risk, hence the portfolio is more diversified.

Practical insights include:

- Among Asset Classes: Common stocks and bonds generally have low correlations, making them efficient diversifiers.
- The Whole Spectrum: Holding various investment types within an asset class lessens the opportunity for sector specific downside.
- Diversify geographically: International investments can also lower your risk because economies and markets don't always move in the same way at the same time.

However, diversification has limits. It can't eliminate systemic risk, like a recession or a global crisis that impacts all assets. And correlations can shift in a crisis; assets that typically move independently of one another sometimes tumble simultaneously, erasing the benefits of diversification at a point when they are needed most.

But still, correlation and diversification are at the heart of portfolio theory. They emphasize that risk management is not just a function of the number of assets a fund holds, but how the assets relate to one another.

### 9.3.5 Practical Applications and Criticism of MPT

There are very powerful and practical applications of Modern Portfolio Theory in the field of Finance. It has turned into the foundation of asset allocation tactics, investment funds and risk-management tools.

### Applications:

- **Portfolio Construction:** Financial advisors utilize MPT to scrutinize and develop portfolios that achieve an acceptable level of risk and return with investments shaped by investor objectives.
- **Mutual Funds and ETFs:** These are well endowed with diversification, providing you as an investor access to efficient portfolios.
- **An Investing Institution:** MPT is used by pension funds and endowments, to decide how much to invest in stocks, bonds and alternatives.
- **Evaluation of Risk:** MPT offers risk assessments (variance, covariance and forward-looking efficient frontier) to assess performance in terms of risk.

### Criticism:

- **Unrealistic Assumptions:** Rational investors, efficient markets and normal distribution of returns are the unrealistic assumptions on which MPT is based. Actually markets are inefficient, and extreme events are more common than normal distributions imply.
- **Input Sensitivity:** The MPT is based on predictions of mean returns, variances and covariances. With such small inputs errors, results are very sensitive.
- **Instability of Correlations:** The correlations between assets change. In periods of distress, things that would normally be risk-off assets end up being managed the same way.

**Neglect of Other Risks:** MPT concentrates on market risk and return, with no attention to liquidity, credit or behavioral risks which also count.

Nevertheless, MPT's impact endures by virtue of its enduring lessons. It offers a beginning-based reference for asset allocation, and the vast majority of practitioners supplement it with more sophisticated models and stress-testing to incorporate real-world complexities.

### Knowledge Check for 9.3

1. Who developed Modern Portfolio Theory (MPT)?
  - a) Sharpe
  - b) Markowitz
  - c) Fama
  - d) Ross
  
2. What does the efficient frontier represent?
  - a) Risk-free asset
  - b) Optimal portfolios
  - c) Market index
  - d) Arbitrage profits
  
3. Which correlation provides maximum diversification benefit?
  - a) +1
  - b) 0
  - c) -1
  - d) +0.5

4. The optimal portfolio is chosen at the point of:
  - a) Indifference curve tangent
  - b) Minimum risk point
  - c) Highest return
  - d) Market portfolio only
  
5. Which is a key criticism of MPT?
  - a) Ignores diversification
  - b) Unrealistic assumptions
  - c) No efficient frontier
  - d) Too simple to apply

## 9.4 Portfolio Risk Measurement

Portfolio risk measurement deals with the uncertainty of future returns about a portfolio. Portfolios are formed by many assets and thus systemic risk does not amount to the average asset specific risk but relies on variances, covariances and with variance.

correlations. Accurately weighing risk aids investors to appreciate changes in volatility, discriminate between systematic and unsystematic risks and successfully manage their portfolios.

### 9.4.1 Portfolio Variance and Standard Deviation

The variance and standard deviation are primary risk measures in the theory of portfolios. They measure the degree of spread in returns around their mean value, or how uncertain, or

volatile, returns are apt to be. The higher the variance or standard deviation, the riskier the portfolio.

For one asset, the variance is:

$$\sigma^2 = \sum (R_i - E(R))^2 \times P_i$$

Where:

- $R_i$  = return in state  $i$
- $E(R)$  = expected return
- $P_i$  = probability of state  $i$

Standard deviation is nothing but the square root of variance:

$$\sigma = \sqrt{\sigma^2}$$

In portfolio theory, risk is not just the weighted average of single-risk. Rather, intersubstitutability shapes the risk of portfolios. For a portfolio of two assets, variance is:

$$\sigma_p^2 = w_1^2 \sigma_1^2 + w_2^2 \sigma_2^2 + 2w_1 w_2 \sigma_1 \sigma_2 \rho_{12}$$

Where:

- $w_1, w_2$  = weights of assets
- $\sigma_1^2, \sigma_2^2$  = variances of the assets

- $\rho_{12}$  = correlation between assets The standard deviation of the portfolio is  $\sigma_p = \sqrt{\sigma_p^2}$ . Key Insights:

- When assets are perfectly correlated ( $\rho = +1$ ), there is no advantage to diversification and risk is the weighted average of asset risks.

- Diversification reduces risk when assets are less than perfectly correlated.

- If the two assets are negatively correlated ( $\rho = -1$ ) we can eliminate all risk by adjusting the weights carefully.

Example:

For example, if Asset A has  $\sigma = 10\%$ , and asset B has  $\sigma = 20\%$  with weights of 0.5 each and correlation of 0.5 between them.

$$\sigma_p^2 = (0.5^2 \times 0.10^2) + (0.5^2 \times 0.20^2) + (2 \times 0.5 \times 0.5 \times 0.10 \times 0.20 \times 0.5) \sigma_p^2 = .0025 + .01 + .005 = .0175$$

$$\sigma_p = \sqrt{0.0175} = 13.23\%$$

That means the total portfolio risk (13.23%) is less than the weighted average risk of all these assets (15%). The difference comes from diversification.

Variance and standard deviation serve as the foundation for how risk is measured in a portfolio as they allow investors to assess what level of deeps and peaks their returns should experience.

#### 9.4.2 Covariance and Correlation Among Assets

1 Covariance and Correlation describe how two assets move with respect to each other, and are central in measuring Portfolio Risk.

Covariance Formula:

$$\text{Cov}(R1, R2) = \sum (R1i - E(R1))(R2i - E(R2)) \times Pi$$

3 Covariance assesses whether returns on assets are moving in tandem. A positive covariance indicates that they tend to move in the same direction, and a negative one means they tend to cross each other.

Correlation Formula:

$$\rho_{12} = \text{Cov}(R1, R2) \div (\sigma_1\sigma_2)$$

Correlation makes covariance unitless between -1 and +1.

- $\rho = +1$  Perfectly positive: There is no diversification benefit.
- $\rho = 0$ —no relation; risk can be eliminated with a diversified portfolio.
- $\rho = -1$ : Total negative relationship, diversification can wipe out risk.

Importance in Portfolios:

Risk Dilution: The lesser the correlation between assets, stronger are the diversification benefits.

Portfolio formation Investors can optimize portfolios to minimize total variance across assets.

How Are the Returns of Different REITs (Real Estate Investment Trusts) Correlated?

Example:

Let's say that Stock A goes higher as Stock B pulls back. Even if the covariance is  $-0.002$  and correlation is  $-0.8$ , we get less risk in a portfolio when we combine two stocks together. That effect demonstrates the strength of diversification.

Applications:

- Investment managers frequently look at correlation matrices to determine how to allocate assets.
- Hedge funds employ negatively correlated assets (such as stocks and bonds) to stabilize returns.
- International diversification can help lower correlation because the markets in different countries don't move in tandem.

So covariance and correlation tell us how diversification works and are going to be critical for being able to measure portfolio risk properly.

#### 9.4.3 Systematic vs Unsystematic Risk in Portfolios

There are two types of risk associated with portfolios: systematic risk and nonsystematic risk. It is important to know the difference, especially when shaping diversified investments.

- Systematic Risk (Market Risk):

This is a market risk and not diversifiable. It can grow out of such events as economic downturns, shifts in interest rates, inflation or something global. Examples include a financial crisis in 2008 or an unexpected increase in oil prices for the entire economy.

- Unsystematic Risk (Specific Risk):

This is specific to a company or an industry. It could stem from things like management shakeups, product recalls, strikes or competition pressures. Unsystematic risk can be diversified away since the bad performance by one asset can be compensated by the good performance of another.

Formula Representation:

Total Risk = Systematic Risk + Non-Systematic Risk

Diversification aims to eliminate unsystematic risk, leaving behind only the systematic one.

Key Points:

- Diversification gets rid of unsystematic risk, not systematic one.
- CAPM and APT consider system risk as the only risk that is priced by investors.
- It's by no means limited to systematic risk, but the fact of the matter is that an investor must simply swallow long-tail risks such as these after diversifying not because the investor sought them out or they were part and parcel of what he was purchasing but despite it.

Example:

If someone's portfolio is nothing but airline stocks, then they not only bear systematic risk (higher fuel prices) but also unsystematic risk (one of the airlines goes out of business). The investor has therefore diversified away unsystematic risk by including airline, technology, healthcare and bond investments. But in the event of a global recession, systemic risk can overpower all investments.

This distinction between systematic and unsystematic risk helps to explain why diversification works, yet by the same token can never eliminate all exposedness to risk.

### 9.4.3 Systematic vs Unsystematic Risk in Portfolios

Beta ( $\beta$ ) is an important measure of systematic risk and also helps analyze portfolio volatility. It quantifies how much an asset's returns react to the entire market moves.

Formula for Beta:

$$\beta_i = \text{Cov}(R_i, R_m) \div \text{Var}(R_m)$$

Where:

- $R_i$  = return of asset  $i$
- $R_m$  = return of the market portfolio

Interpretation of Beta:

- $\beta = 1$ : Asset mirrors the market.
- $\beta > 1$ : Asset is less volatile than the market (aggressive).

- $\beta > 1$  if they are aggressive. Therefore, beta acts as a link between portfolio volatility and market exposure in order to allow investors to know how much systematic risk they are taking.

#### 9.4.5 Risk Measurement in Real-World Portfolios

Despite the relevance of theoretical models such as variance, covariance and beta, there are other complexities that real-world portfolios must be confronted with in terms of risk measurement. Operational risk is an evolving discipline that should take in consideration market conditions, unexpected events and different type of sources of the risks that will be addressed.

##### Key Methods in Practice:

- Value-at-Risk (VaR): Quantifies the amount of potential loss which is unlikely to be exceeded at a specific level of confidence over a designated time period.
- Stress Testing: Simulates severe market scenarios to assess the portfolio's robustness out of a position.
- Scenarios: Simulates historical or scenario-based market data for performance testing of portfolios operating in an alternate "real-world" environment.
- Tracking Error: A statistical measure of the standard deviation of a portfolio's excess return relative to the benchmark index.

##### Real-World Challenges:

- Time-Varying Correlations: Correlations between assets change across time – some would argue particularly during crisis periods where correlations tend to rise.

- **Non-Normal Distributions:** Asset returns may be asymmetric and have fat tails, rendering variance-based measures inappropriate.
- **Liquidity Risk:** It may be difficult to sell the fund's portfolio investments at any good price.
- **Behavioral Biases:** Investors' psychology can lead to more volatility than predicted by models.

Example:

In the 2008 crisis, portfolios that were diversified across asset classes still took very large losses because correlations between equities, commodities and real estate moved up rather dramatically." Conventional variance and beta measures both underestimated the actual risk exposure.

Developers of such models believe they will become plausible as input to investment analysis only to the extent that portfolio managers are prepared to blend them with assumptions, macroeconomic views and real-time monitoring. They might use VaR to calculate daily risks, stress tests to be ready for shocks, and analyse beta exposures to market risk.

In reality, the measurement of risk is not a single event but an ongoing process to accommodate varying market conditions. We cannot aim to eliminate risk, we must be able measure it, understand and manage as also hold to some standard of reason while doing so.

## 9.5 Summary

Modern Portfolio Theory (MPT), as developed by Harry Markowitz, moved the analysis from a single asset to the portfolio level.

The Efficient Frontier is a set of portfolios that provide the maximum return at each level of risk.



27 The scholastic American who created CAPM defined a linear relationship between systematic risk -beta- and expected return.

**Security Market Line (SML)** This figure graphically depicts the CAPM formula and allows us to locate undervalued and overvalued securities.

APT is a multivariate theory of return in the sense that it shows how expected rate of return on an asset depends not only on just one market premium (related to single factor model) but also on several economic features such as inflation, changes in interest rates etc.

Diversifiable risk is unsystematic – this can be reduced through diversification Non-diversifiable risk is systematic – cannot reduce CPP Investment Board, 2013RPS pension plan Risk 101Fall 2015Prof. J.E.HELWER-ROBERTS13 It is an easy concept to understand when we apply a business example: Specific to Company A: Examples include: suppliers failing Shipments not received on time Raw Material Supplier May go Belly up Novo Nordisk had a fire in one of its plants Rubber farm of Michelin in Thailand Employees strike South Africa had blackouts UNION federally mandated health care contract Products are defective (it will harm the reputation rather the product) Systems failure Unequal competitive ability Unsystematic risks affecting specific companies and assets fall under systematic or market factors e.g.: These business/company-specific events do not affect value of other investments performed by the investors Universal risks that increase or decrease in relation with systemic macroeconomic factors.common to all firms within an industry or economyIncreased severity currently accounts for approximately that it only affects products from Japan, increased rate kickbacks to members small Like many types of insurance companies Insurance Business Vehicle Antique Cars Financial Sectors Residential BuildingsInsurance Homes Auto Medical Senior Living Industrial Office Logistics view detail Biggest concern focuses on big mixed catalogue producers Reduce repeat threats revenues which due Major disrupting device indefinitelycompanieswith themnew Profit IssuePurchasecategorized cheapandsmallprofits Small simpleTypical threat dated returns Energy futures Exposure Small privately Risk coveragesRiskhousecreditguide protectpolicyholders Causality works Coverage matters Short-term assumptionsMarketing Plan houseworksConstruction itemsIndustrial StatisticsAgriculturalUsclients / subsidiariesBuying well-known points / subsidiesCustomer service NicheDry VanFloorsFleetLegal & ProfessionalGestation from Funding FirstIssue Etc Flexibility MixturePoor Quality etcMicro Tracking especiallyThreats TrafficControl System UpdatedResources Being ThreatsVentures Sales Date StrategicAccountingWebsite outsourcingMore informationOutsourcing MarketingHandlingCompletionCo-immunizationEducation More OpportunitiesBlacklisted collectionHostingDead accessCostTelemarketing expense LostFootprint.com Request MailServersAccountancy Local

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ServicesPizza File SizeServerRequest For SaleAssetsNotBusinessBuildingMoneyComputing  
LowHighMovingFull quote typeall ThingsInterestedMotorbike ShareUtilityInstallSmart  
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ProtectionScamPropertySearchAccess ControlListThrivent outlineCopyrightSchedule  
updateFor TermsTranscriptPayPriceAboutParentscoml  
earlyChangeLockDealGrowMastersGoLoansLatticePortalSuper SupportnesotalIRS Years  
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CallerWomenYahooSerachlakeCreditInternetATThe Great Railconsult

Variance and standard deviation of a portfolio are the basic measures of risk in the portfolio.

Correlation and Covariance are key factors to understanding how diversification works.

43 Beta is a measure of sensitivity to market movements and is important for estimating the expected return.

Real-world portfolios also include risk calculations, such as VaR, stress testing and scenario analysis.

Objections to MPT include unreal perceptions, unstable correlations, and disregard of behavioral considerations.

Notwithstanding their limitations, these theories have been and continue to be the cornerstones in investment decisions and risk evaluation.

## 9.6 Key Terms

MPT (Modern Portfolio Theory): Model for constructing diversified portfolios given a risk-return trade-off.

22 Efficient Frontier:} Curve representing those portfolios with the highest return for a given level of risk.

4 CAPM: Predictive model that describes the relationship between an asset's beta and its expected mean return.

Beta ( $\beta$ ) : A measure of an asset return sensitivity to the market returns.

44 Systematic Risk: General market risk that cannot be eliminated through diversification.

Unsystematic Risk: The component of risk due to factors specific to an individual firm or industry and that can be eliminated through proper diversification.

35 Security Market Line (SML) : A plot illustrating the relationship between risk and return of an asset or a portfolio of assets in Capital Asset Pricing Model.

APT: Unlike CAPM, it should be clear what's going on when we try to explain returns by multiple factors (with the same base "risk-free" bet).

Covariance: A measure of how two assets tend to move together.

Correlation ( $\rho$ ): Standardized dimensionless degree of asset co-holding,  $-1 \leq \rho \leq 1$ .

Variance ( $\sigma^2$ ): Degree of spread of the returns around the average.

9 Value at Risk (VaR): Model-based estimate of the maximum possible loss of a portfolio over a holding-period time horizon that would be expected to be exceeded with known probability, and at a given confidence level.

## 9.7 Descriptive Questions

6 Discuss the role of Harry Markowitz in Modern Portfolio Theory.

What is the Efficient Frontier? What is it and how does this help investors when it comes to portfolio construction?

Explain the formula and elements of CAPM with relevant examples.

Contrast between CAPM and APT on assumptions, factors, and uses.

Illustrate what is the meaning of systematic and unsystematic risk with real life examples.

In what way does correlation and diversification impact portfolio variance?

Discuss the good and bad points of MPT in today's markets.

Explain other ways of measuring risk in the real world besides standard deviation and variance.

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Knowledge Check 1

b) Markowitz

b) Optimal portfolios

c) -1

a) Indifference curve tangent

a) Unrealistic assumptions

## 9.9 Case Study

### Background:

Apex Wealth Managers is a mid-tier investment advisory firm and they need to create an efficient model that would provide the best investment portfolio for the clients, High Net-worth Individuals (HNI). The year is characterized by global welter: Interest rates are on the rise because of inflationary pressures, stocks markets are suffering wild swings and commodities like oil are being rocked by tumultuous price movements. Clients are worried about protecting capital as well as a little growth.

The company chooses to use MPT, CAPM, and APT principles when constructing a well-diversified portfolio. The goal is to build a portfolio that effectively reduces risk and provides competitive returns given the dynamic economic backdrop.

### Step 1: Risk and Return of Assets Are Analyzed

The company analyzes four primary asset groups: stocks, bonds, commodities and real estate investment trusts (REITs). Their average return, variance, and correlation of historic data are accumulated. On the basis of these inputs, the return for every asset is projected and the covariance matrix is formed.

Step 2: Use Modern Portfolio Theory to Apply Optimal Leverage.

The firm uses MPT to determine portfolio combinations, which are then plotted on the risk/return graph. Portfolios under the efficient frontier are dominated. The efficient frontier is detected that provides portfolios according to their levels of returns for the risk they hold. Customers are taught this balancing act through basic examples.

3 Using CAPM for Asset Pricing

(n.d.).CAPM to calculate a fair expected return on a couple of select stocks | Treynor-adjusted PK model. For instance, for the risk-free rate of 3%, market return of 10% and the stock beta being 1.2:

$$E(R_i) = 3\% + 1.2 \times (10\% - 3\%) = 11.4\%$$

Stocks with expected return greater than the CAPM's forecast are deemed undervalued and we purchase stocks to our portfolio.

Step 4: Incorporating APT Factors

The firm also considers many variables such as inflation, interest rates and exchange rates. On the sensitivity side is interesting that the effect seems to be stronger in commodities with respect to inflation between date t and date t-252, while bonds seem to be sensitive versus interest rates. This contrasts the exposures to reduce factor-specific risks.

Step 5: Final Portfolio Selection

Selected portfolio is made 50% of stocks (in strategies, 25% bonds, 15% commodities and 10% REITs). This is on the efficient frontier and fits with moderate-risk tolerance.

### Problem Statements and Solutions

Problem 1: How do you decrease the volatility of your total portfolio, when equity markets go crazy? Solution: Portfolio volatility can be brought down with nothing given up in expected return, just by allocating more to bonds and commodities, whose correlation with equities is low.

Issue 2: Has the chosen stocks been priced right using CAPM?

Solution: It is through the comparison between real expected returns and CAPM forecasts that the company selects undervalued stocks to assemble in its portfolio and avoids the overvalued ones.

Question 3: How is APT useful in addressing non-diversifiable risks that are not covered by CAPM?

Weightage a) APT takes various economy subjects such as inflation, interest rate, etc. Therefore portfolio is sensitive to major macroeconomic factor than market risk only.

### Reflective Questions

What would make diversifying based on asset class better than within a single class?

What's the effect of correlation on diversification?

12 Clearly, APT explains the returns in a better way than CAPM.

Is it at all possible to rid portfolio risk altogether? Why or why not?

In what ways are behavioral biases thought to weaken the implications of MPT?

## Conclusion

The case provides an example of the practical use of theoretical models such as MPT, CAPM and APT in a portfolio construction exercise. With some understanding of variance, correlation, beta, and factor sensitivities, Apex Wealth Managers built a well-diversified portfolio that matched their clients' objectives. Whilst models have their weaknesses, when they are used as a supplement to judgement and market insight, there is nothing better in terms of decision making.