

BCU
6th Semester
Investment Management
Module No.3: Risk & Return

Syllabus : Risk and Return Concepts: Concept of Risk –Types of Risk-Systematic risk –Unsystematic risk – Calculation of Risk and returns. Portfolio Risk and Return: Expected returns of a portfolio – Calculation of Portfolio Risk and Return. (Problems on Calculation of Risk and Returns on Portfolio)

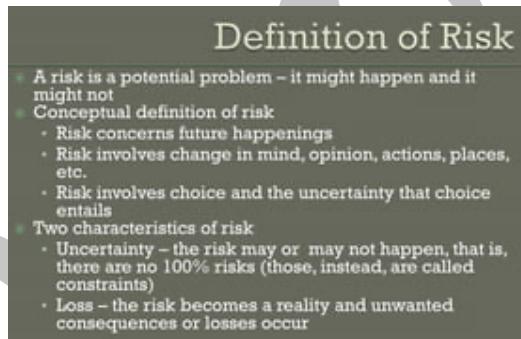
Introduction :

Risk is defined in financial terms as the chance that an outcome or investment's actual gains will differ from an expected outcome or return. Risk includes the possibility of losing some or all of an original investment. Quantifiably, risk is usually assessed by considering historical behaviours and outcomes. In finance, standard deviation is a common metric associated with risk. Standard deviation provides a measure of the volatility of asset prices in comparison to their historical averages in a given time frame.

Overall, it is possible and prudent to manage investing risks by understanding the basics of risk and how it is measured. Learning the risks that can apply to different scenarios and some of the ways to manage them holistically will help all types of investors and business managers to avoid unnecessary and costly losses.

Risk in the context of finance and investment, refers to the uncertainty regarding the financial returns or outcomes of an investment, and the potential for an investor to experience losses or gains different from what was initially expected. It is a fundamental concept that underpins nearly all financial decisions and strategies. The essence of risk is the variability of returns, which can be influenced by a myriad of factors, including economic changes, market volatility, political instability, and specific events affecting individual companies or industries.

Risk definition :



The term “risk” is defined as “*the possibility that events will occur and affect the achievement of strategy and business objectives.*” It is often considered in terms of severity. In some instances, risk could relate to the anticipation of an expected event that does not occur.

Risk is defined as the probability or uncertainty of losses rather than expected profit from investment due to a fall in the fair price of securities such as bonds, stocks, real estate, etc. Each type of investment is exposed to risk like the market risk i.e., the loss on the invested amount or the default risk i.e., the money invested is never returned back to the investor

Concept of Risk :

The term 'risk' is commonly used in the investment sector. In everyday life, the word risk frequently connotes an unexpected negative outcome. When you say it is risk to drive on a certain route, you are implying that driving on that route could result in an accident. The term risk in the context of investments, on the other hand,

has a different meaning. It not only denotes the possibility of a negative outcome but also the likelihood of a less positive outcome. As you are aware risk and return are interrelated. A person purchases a financial asset with the intent of receiving a profit. The investment decision would be based on an 'anticipated return,' which may be realized or not. The risk associated with an investment decision is the possibility of an "unexpected" negative or "adverse" return. Almost every decision involves some level of risk. When a manufacturing manager chooses equipment, a marketing manager creates an ad campaign, or a finance manager manages a portfolio of assets, they are all dealing with uncertain cash flows.

The financial analysis includes assessing risks and incorporating their likely effect into financial decisions. The variability in return from security is described as a risk in theory. On the other hand, security that generates consistent returns over time and the returns are assured based on some type of guarantee usually sovereign guarantee is referred to as a "risk-less security" or "risk-free security," whereas security that generates inconsistent returns over time is referred to as a "risky asset." Take a look at the following options, for

example: Rs.1000, 12% 2020 Government of India Loan.

Rs.100, 14.5% 2005 TISCO Non-Convertible Debentures.

The Government Loan would have zero risk because the government system does not collapse, and interest and principal repayments are guaranteed. In the case of TISCO debentures, here are protective covers in the shape of corporate assets and sustained solid financial performance, but there is a risk of poor performance and default. For many investors, investment risk is a major source of anxiety. When a secondary market fails to respond to rational expectations, the risk component of such markets is rather large, and most investors are unaware of the true risk involved in the investment process.

Risk aversion is a characteristic that many small investors have in the secondary market. Small investors, in particular, look to the market for a certain return, and when their expectations are not satisfied, it has a detrimental impact on their morale. As a result, these investors prefer to put their money into assets that will give them a small return on average rather than securities that may give them a large return on average but fluctuate wildly. There are also risk-taking investors in the financial system. Speculators are risk-takers who choose to invest in securities that provide large returns even though the certainty of such returns is relatively low. In the market, they are also known as risk-takers. A secondary market requires both risk-takers and risk-averse investors.

In figure-3.1(i), an investor given the following investment options would surely pick investment 'B' over investment 'A'. Whereas in figure 3.1(ii), Investment 'A' provides a predictable income stream. Comparing Figures 3.1 (i) and 3.1 (ii), we find Investment 'B' is predictable in the figure 3.1(i) but variable in figure 3.1 (ii). The risk of a security is defined as the volatility in the flow of income to investors. Despite the danger in the second case, the investor's preference would still be for investment 'B' because it provides a better return almost every time. This can be interpreted as the investor is compensated with higher return for taking greater risk.

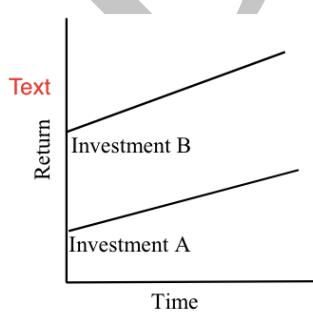
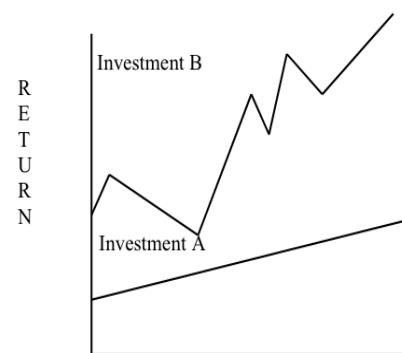
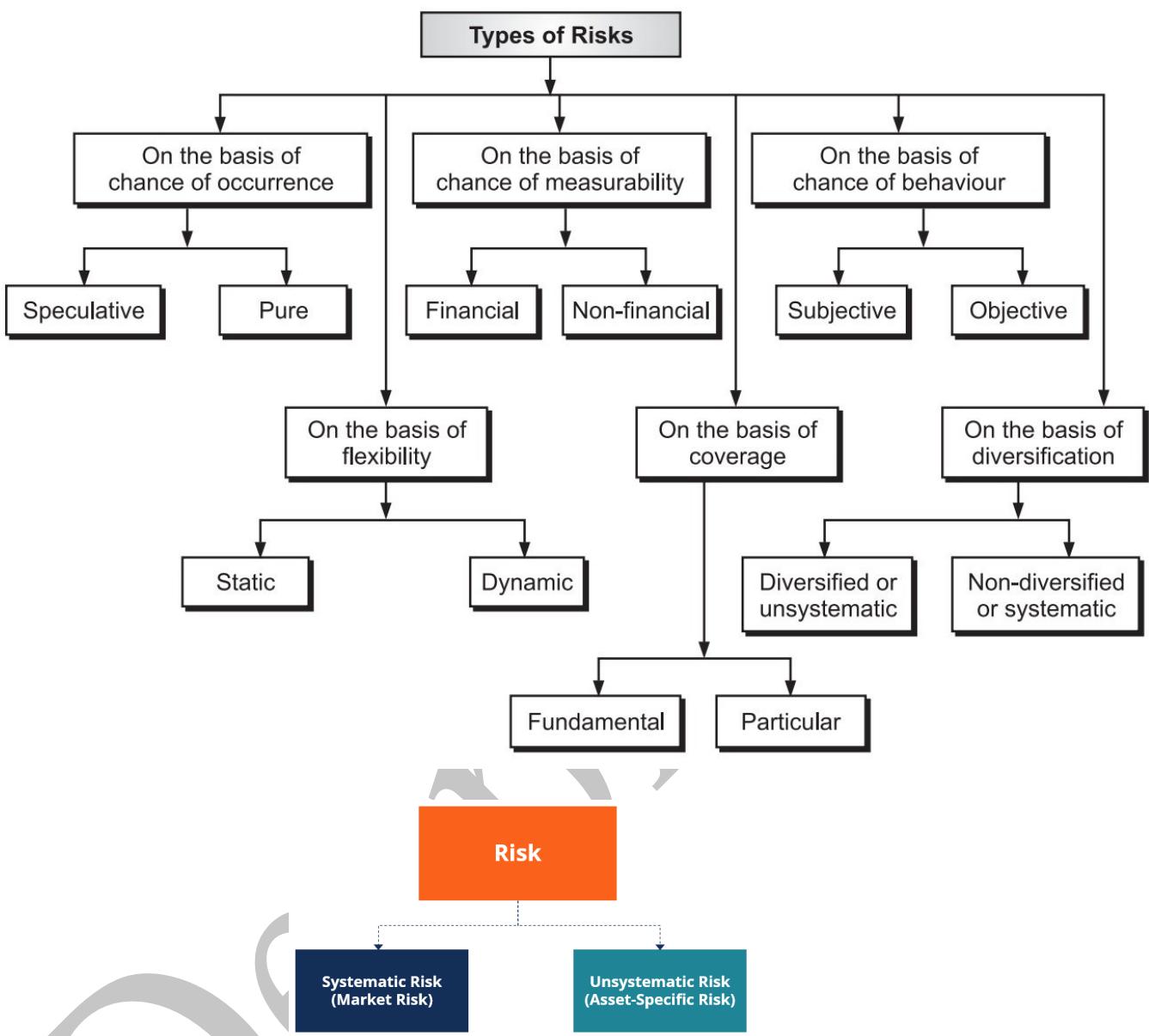


Figure 3.1 (i) Consistent Return



3.1(ii) Fluctuating Return



The first three types of risk in investments, namely market risk, interest rate risk, and inflation risk, are external to the firm and therefore cannot be managed. These are all pervasive and have an impact on all businesses. The business and financial risk, on the other hand, are controlled and internal to a certain corporation. Based on this analysis, the risk may be classified into systematic and unsystematic risk.

i) Systematic Risk. The portion of return variability induced by factors impacting all enterprises is referred to as systematic risk. Diversification will not be able to mitigate such a risk.

The following are some examples of systemic risk:

- ¬ The government changes the interest rate policy.
- ¬ The corporate tax rate is increased.
- ¬ The government resorts to massive deficit financing.
- ¬ The inflation rate increased.
- ¬ The Central Bank of the Country promulgates a restrictive credit policy.
- ¬ Government fails to attract FIIs

1. Market Risk (Systematic Risk): <https://youtu.be/TE8uxeBmzRc?si=9lv-o1kpuzPqd-ps>

Market risk, also known as systematic risk, encompasses the risk inherent to the entire market or market segment. It is the uncertainty that any financial instrument might face due to fluctuations in market variables such as interest rates, foreign exchange rates, stock prices, and commodity prices. Market risk cannot be eliminated through diversification because it affects all investments to some degree. This type of risk is influenced by geopolitical events, economic recessions, and changes in fiscal policy. Investors manage market risk through hedging strategies and asset allocation.

Market Risk is the risk of an investment losing its value due to various economic events that can affect the entire market. The main types of market risk include:

- **Equity Risk:** This risk pertains to the investment in the shares. The market price of the shares is **volatile** and keeps on increasing or decreasing based on various factors. Thus, equity risk is the drop in the market price of the shares.
- **Interest Rate Risk:** **Interest rate risk** applies to the debt securities. Interest rates affect the debt securities negatively i.e., the **market value** of the debt securities increases if the interest rates decrease.
- **Currency Risk:** Currency risk pertains to foreign exchange investments. The risk of losing money on foreign exchange investments because of movement in the exchange rates is currency risk. For example, if the US dollar depreciates to Indian Rupee, the investment in US dollars will be of less value in Indian Rupee.

2. Credit Risk (Default Risk)

Credit risk, or default risk, refers to the possibility that a borrower will fail to meet their obligations in accordance with agreed terms. This risk is of particular concern to lenders, bondholders, and creditors. Credit risk assessment models evaluate the likelihood of default. To mitigate credit risk, lenders often require collateral or use credit derivatives and diversify their lending portfolio across various sectors and borrowers.

The issuer of the bond may face financial difficulties due to which it may not be able to pay the interest or principal to the bond investors, thus, defaulting on its obligations. It also applies for loans given by banks and financial institution to borrowers. The banks invest their money on borrowers by giving them loans and earns interest as return. However, if the borrower defaults during the loan repayment, it is a bad **debt** for the financial institutions and is a source of huge risk for them.

3. Liquidity Risk

Liquidity risk involves the risk that an entity will not be able to meet its short- term financial obligations due to the inability to convert assets into cash without significant loss. It affects both individuals and institutions and can be subdivided into asset liquidity risk and funding liquidity risk. Asset liquidity risk is the difficulty in selling assets quickly at their fair value, while funding liquidity risk relates to the challenge in obtaining funds to meet obligations. Management strategies include maintaining adequate cash reserves and having access to reliable funding sources. Another important point to note is that there are some assets that cannot be easily liquidated. Thus the investors demand more return for such investments as a compensation for holding them for a long time and not being able to use them as and when required.

4. Operational Risk

Operational risk is associated with failures in internal processes, people, and systems, or from external events. This includes everything from business disruptions, system failures, fraud, and cyberattacks to legal risks and natural disasters. Unlike market or credit risk, operational risk is more difficult to quantify and manage because it encompasses a wide range of unpredictable factors. Organizations address operational risk through robust internal controls, continuous monitoring, and having effective disaster recovery and business continuity plans.

5. Country and Political Risk

Country risk involves the uncertainties that international investing brings, including economic, political, and social instability in the country where the investment is made. Political risk refers more specifically to the risk of loss from changes in government policy, expropriation of assets, and civil unrest. These risks can affect the overall investment climate and specific asset values. Investors mitigate these risks through geopolitical analysis, diversification, and sometimes, by purchasing political risk insurance.

6. Interest Rate Risk

Interest rate risk is the risk that an investment's value will change due to a change in the absolute level of interest rates, in the spread between two rates, in the shape of the yield curve, or in any other interest rate relationship. This type of risk particularly affects bonds, as their prices are inversely related to interest rates. Managing interest rate risk involves adjusting portfolio duration, diversifying across different types of rates, and using interest rate derivatives.

7. Reinvestment Risk

Reinvestment Risk is the risk of losing higher returns on the principal or income because of the low rate of interest. Consider a **bond** providing a return of 7% has matured, and the principal has to be invested at 5%, thus losing an opportunity to earn higher returns.

8. Inflation Risk

Inflation Risk is the risk of loss of purchasing power because the investments do not earn higher returns than inflation. Inflation eats away the returns and lowers the purchasing power of money. If the return on investment is lower than the inflation, the investor is at a higher inflation risk which reduces their **investment risk tolerance** capacity.

9. Horizon Risk

Horizon Risk is the risk of shortening of investment horizon due to personal events like loss of job, marriage or buying a house, etc. Preferences and needs of investors keep changing as per the changes in financial conditions or the state of the economy. An investment made for a particular purpose might lose its value due to certain sudden emergency. The investor has to cut short the timing of holding the investment, thus losing the return that they could have earned from it had they kept it longer.

10. Longevity Risk

Longevity Risk is the risk of outliving the savings or investments, particularly pertain to retired or nearing retirement individuals. They might end up living longer than their own saving can sustain them or support them. This proves to be a huge risk because they usually do not have a steady source of income and their savings might be over due to lack of opportunity of getting replenished.

II) Unsystematic Risk.

The unsystematic risk is the variation in the return of an investment owing to factors that are specific to the firm and not to the market as a whole. Unsystematic, or unique risk, is a type of risk that can be completely mitigated through diversification.

The following are some examples of unsystematic risk:

- Workers declare a strike in a company.
- The R&D expert of the company leaves.
- A formidable competitor enters the market.
- The company loses a big contract in a bid.
- The company makes a breakthrough in process of innovation.
- The government increases custom duty on the material used by the company.
- The company is not able to obtain an adequate quantity of raw material used by the company.

Total risk is equal to systematic risk + non-systematic risk because the two components are additive. In most cases, systemic risk is calculated by comparing the stock's performance to the market's performance under

various scenarios. For example, if the stock appreciates more than other stocks in the market during a good period and depreciates more than other stocks in the

(vi) On the Basis of Diversification: Diversified and Non-diversified Risk

The most commonly risks used in investment decisions are diversified and non-diversified risk. The diversified risk is called as unsystematic risk, and non-diversified risk is known as systematic risk. In simple words, the risk which is very much inherent in the system, and cannot be separated from the system (system may be an organisation, industry, class of securities etc.) is called systematic or non-diversified risk. A risk the level of which can be reduced or managed by diversifying investment is called diversified risk, such risks are not rooted in the system, therefore also known as unsystematic risks.

Interest rates, recession, taxation policy, and wars all represent sources of systematic risk because they affect the entire market and cannot be avoided through diversification. Systematic risk can be mitigated only by means of hedging. Systematic risk underlies all other investment risks. If there is inflation, investor can invest in securities in inflation resistant economic sectors. If interest rates are high, investor can sell stocks and move into bonds. However, if the entire economy under performs, then the best that one investor can do find investments opportunities that at-least cover minimum cost of operations.

Every security or holding of assets have inherent bearing of risk which cannot be avoided through diversification. However, other risks, such as unsystematic could be reduced through diversification. The mechanism of diversification has been presented in Figure 10.2 given below.

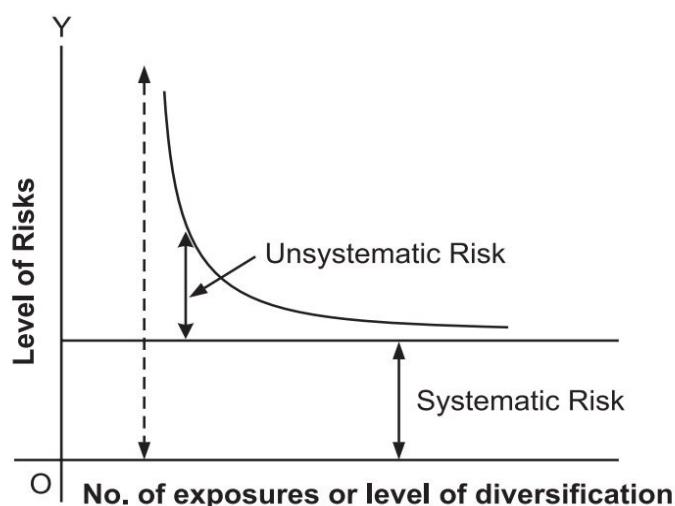


Figure 10.2: Systematic and Unsystematic Risks

Figure 10.2 explains the relationship between level of risk and level of diversification. The horizontal line parallel to x-axis shows the in-build/ inherent/ systematic risk of

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a company which cannot be diversified. Y-axis states the level of risk or total risk. The arc above the horizontal line moving downwards shows the declining level of unsystematic risk by increasing the number of exposures, or level of diversification.

In investment decisions, both Systematic and Un-systematic risks play important role. Systematic risk includes: (a) market risk, (b) interest rate risk, (c) inflation rate risk (purchasing power risk).

(a) **Market Risk** is caused by investors reaction to tangible as well as intangible events. The stock prices fluctuate due to various reasons. The frequency of change in prices may be high or short in time, or remain unchanged over a period. A general rise in stock prices is referred to as bullish trend, and vice-versa situation is referred as bearish trend. An investor can record these changes from the share price indices of stock-markets. There are various factors which influence market risk ranging from economic to political, entrepreneurial to social. The causes of these phenomenon are varied, but its magnitude depends upon investors' attitude. The initial reaction signals a fear of loss, but following a herd instinct builds a situation that seems all investors will take exit, such emotional instability of investors collectively leads to a snowballing overreaction. The market risk is the major constituent of systematic risk.

(b) **Interest Rate Risk** refers to the uncertainty of future market values and of the size of future income, caused by fluctuations in the general level of interest rates. The interest rate risk particularly affects debt securities. An increase in interest rate causes decline in the prices of debt security, and vice-versa. It means there is inverse relationship between interest rate and prices of debt securities. For example, a debt security of face value of ₹100 issued with a coupon rate of 10% when the prevailing interest rate in the market was also 10%. Subsequently, the interest rate in the market increases to 12.5%, now at this situation, no investor will buy debt security yielding 10% interest rate as it is not sufficient to cover up the cost to be increased due change in general level of prices i.e., 12.5%. This will cause decline in the price of the debt security up to a level which could yield same amount of interest at 12.5% i.e., ₹80. Thus, an investor will ready to buy such debt only at ₹80 in order to earn return equal to market interest rate. From above, the following formula can be drawn for determining value of debt security after change in market interest rate.

$$\text{Debt Price} = \frac{\text{Coupon Rate of Debt Security}}{\text{Market Interest Rate}} \times \text{Face Value of Bond}$$

$$\text{Debt Price} = \frac{10\%}{12.5\%} \times 100 = 80$$

In addition to the direct, systematic effect on debt securities, there are indirect effects on common stocks. First, higher interest rates make the purchase of shares less attractive. Higher interest rate reduces the margin of investors who made investments in equities from the interest earned from debts. Secondly, many firms, especially public institutions, are heavily financed their business

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operations with debt securities, an increase in interest rate amounts to increase in cost of capital, and reduces their earning capacity. A decline in earnings for shareholders tends to decline share price of the company.

- (c) **Purchasing Power Risk (or Inflation Risk)** refers to the impact of inflation on an investment. A general increase in price level of goods and services called inflation. The immediate impact of inflation is that it postpones the consumption. In investment management, investment in securities is also considered as consumption. Thereby mean that an increase in inflation rate declines the purchasing power of investors, and vice-versa. Rational investors should include, in their estimate of expected return, an allowance for purchasing power risk. Inflation risk impacts both debt securities and equity market in same direction.

Unsystematic Risk are, generally, indicated by leverages of a firm. Unsystematic risk includes the following types of risk: (a) Business risk, and (b) Financial risk.

- (a) **Business Risk** is a function of the operating conditions faced by a company and a variability in operating income caused by the operating conditions of the economy. An increase in business operating income lower down the business risk, and on contrary a high fluctuation in operating income over a future period amounts to uncertainty, thus, increase business risk. Since this risk is largely associated with internal investments and return thereon, therefore known as operating risk of the company. The operating income is the resulted outcome of operating revenue over operating variable expenses and operating fixed expenses. Larger the portion of fixed operating expenses in a firm's total expenses means more operating risk. The business risk of firm is calculated with the help of operating leverage, as shown below.

$$\text{Operating Risk} = \text{Degree of Operating Leverage}$$

$$\text{Degree of Operating Leverage} = \frac{\text{Percentage change in operating income}}{\text{Percentage change in sales}}$$

You may refer chapter on Leverages for detail discussion on degree of operating leverage.

- (b) **Financial Risk** is associated with financing activities of a firm. As we have made discussion in earlier chapters that a company may have two types of securities in its capital structure, *viz.*, equity capital and debt securities. As the number of debt securities increases in total capital the fixed charge, i.e., interest on such debt securities, also increases. Since, payment of interest on debt securities is mandatory therefore, amount remaining after such fixed charges also come down and reduces the EPS of equity share. The financial risk of a company may be measured with degree of financial leverage.

$$\text{Financial Risk} = \text{Degree of Financial Leverage}$$

$$\text{Degree of Financial Leverage} = \frac{\text{Percentage change in EPS}}{\text{Percentage change in EBIT}}$$

In case when $DOL > 1$, it reveals existence of operating risk, similarly a situation where $DFL > 1$, it also an indication of financial risk.

The total risk in a firm, from investment management point of view, is sum of systematic and unsystematic risk, as shown below.

$$\text{Total Risk} = \text{Systematic Risk} + \text{Unsystematic Risk}$$

10.4 Returns or Income

The prime objective of making investment in any security is either to yield income on that investment in form of dividend/ interest or appreciation in the investment value. Return is the motivating force and the principal reward in the investment. An appreciation in the investment can also be considered as capital gain on investment. A rate of return on investment provides a basis of comparison among given alternative investment opportunities. There are two types of returns are, commonly, discussed under investment management, first, realised return and second, expected return. The realized return is the actual outcome on investment, on the other hand expected return is the probable return on investment over future period. The expected return is calculated for both purposes i.e., annual return, as well as capital growth in investment over a given future period.

The term yield is often used in connection with return. Yield refers to the income component in relation to the price paid for a security, as well as change in price of the investment (at the time of selling such security) in relation to the price at which it was bought. In order to compute total return, one has to consider probable decrease or increase in the principal amount of investment along with annual income on such investment, thus,

$$\text{Total Return} = \text{Income} + \text{Change in Price of Investment } (+/-)$$

Return on equity (in percent value) will be computed as given below:

$$\text{Return} = \frac{\text{Income}}{\text{Price paid for security}} + \frac{\text{Change in price of a security over a period}}{\text{Price paid for security}}$$

$$\text{Or, } \text{Return } (\%) = \frac{\text{Income} + \text{Change in price of security over a period}}{\text{Price paid for security}} \times 100$$

$$\text{Or, } \text{Return} = \frac{D_1}{P_0} + \frac{(P_1 - P_0)}{P_0}$$

$$\text{Or, } \text{Return } (\%) = \frac{D_1 + (P_1 - P_0)}{P_0} \times 100$$

Where,

$R(\%)$ = Rate of return, i.e., yield.

D_1 = Dividend received at the end of year, denoted by 1.

P_0 = The value of investment made in year '0'.

Ms P_1 = The value of investment in year '1', to be considered as the year in which security will be realised/sold.



Defining Return

Income received on an investment plus any **change in market price**, usually expressed as a percent of the **beginning market price** of the investment.

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



Return Example

The stock price for Stock A was **\$10** per share 1 year ago. The stock is currently trading at **\$9.50** per share and shareholders just received a **\$1 dividend**. What return was earned over the past year?



Return Example

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$$R = \frac{\$1.00 + (\$9.50 - \$10.00)}{\$10.00} = 5\%$$

Types Of Return

- **Capital gains** – Any good investment will rise in value as time passes by. Thus the assets will be valued higher if they are sold later on as compared to its purchase price, giving capital gain.
- **Dividends** – they are a steady source of income for investors who invest in shares of companies giving regular dividends which are a part of the profits set aside for investors.
- **Interest** – Borrowers like individuals or corporates borrow money for meeting expenses or capital requirements. The lenders give the funds to get interest on the principal amount which is a return on investment for the lenders.
- **Rental income** – Any property rented out can earn rent on a regular basis, which is also a return in the real estate property.
- **Return from currency trading** – Profits earned from trading in exchange rates by using the differences in exchange rate of different currencies is also a form of return for those who do currency trading.

How To Manage?

Although there are risks in investment, these risks can be managed and controlled. Various ways of managing the risks include:

1. **Diversification:** Diversification includes spreading investment into various assets like stocks, bonds, and real estate, etc. This helps the investor as he will gain from other investments if one of them does not perform, thus reducing the **investment risk levels**. Diversification can be achieved across different assets and also within the assets (e.g., investing across various sectors when investing in stocks).

- Investing Consistently (Averaging):** By investing consistently i.e., investing small amounts at regular intervals of time, the investor can average his investment. He will sometimes buy high and sometimes buy low and maintain the initial cost price of the investment. However, if the investment rises in the market price, he will gain on the whole investment.
- Investing for the Long Term:** As per the **investment risk analysis**, long-term investments provide higher returns than short-term investments. Although there is short-term volatility in the prices of securities, however, they generally gain when invested over a longer horizon (5,10, 20 years).

Portfolio Risk and Return: <https://www.slideshare.net/slideshow/risk-and-return-108155791/108155791>

Portfolio risk is a chance that the combination of assets or units, within the investments that you own, fail to meet financial objectives. Each investment within a portfolio carries its own risk, with higher potential return typically meaning higher risk.

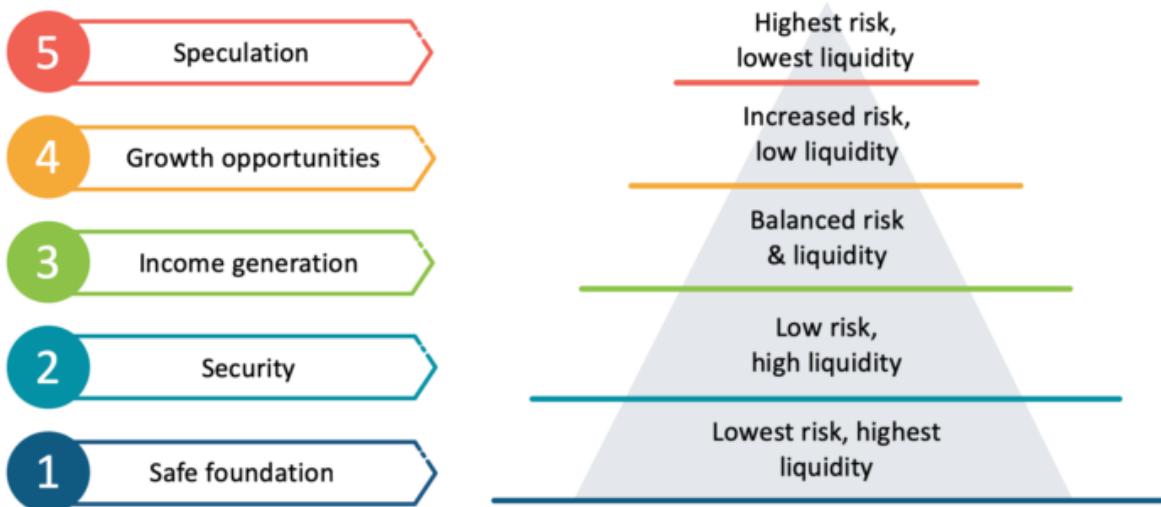
In theory, portfolio risk can be eliminated by successful diversification: holding combinations of investments that do not depend on the same circumstances to return a profit. In reality, though, it is more probable that risks will be minimised and not eliminated entirely.

Portfolio risk is just one of the risks that traders should be wary of. Most risks apply to individual investments, but it is also important to ensure that your portfolio as a whole doesn't end up working against you.

Calculation of Risk and returns:

Risk and return calculations can be used to measure the risk of an investment and its potential return. Risk is the difference between expected and actual returns, and is measured by standard deviation. Returns with a higher standard deviation are riskier.

Risk Levels of Investors Portfolio



Portfolio Risk and Return :

Portfolio risk is the risk that a portfolio of investments may not meet all financial goals. Portfolio risk is usually higher for investments with higher potential returns, but not always. For example, a portfolio of all equities has higher risk and potential returns. However, diversification can help reduce risk and increase returns. Diversification involves holding investments that don't depend on the same circumstances.

For example, you can combine assets with low correlations

Portfolio

- A grouping of financial assets such as stocks, bonds, etc
- A good portfolio consists of financial assets that are not strongly positively correlated
- A portfolio should contain some high-risk and some low-risk securities

Total Stock Return

$$\text{Total Stock Return} = \frac{(P_1 - P_0) + D}{P_0}$$

P_0 = Initial Stock Price

P_1 = Ending Stock Price (Period 1)

D = Dividends

Portfolio

- A diversified portfolio should consist of securities that are not perfectly positively correlated.
- For an individual, a portfolio of almost 7 different securities is considered good.
- For a company, a portfolio containing 20-25 securities is suitable.

Example

- Ali purchased a stock for Rs. 6,000. At the end of the year the stock is worth Rs. 7,500. Ali was paid dividends of Rs. 260. Calculate the total return received by Ali.

$$\begin{aligned}\text{Total Return} &= \frac{[260 + (7,500 - 6,000)]}{6,000} \\ &= 0.293 \\ &= 29.3\%\end{aligned}$$

Expected Return

- The investor cannot be sure of the amount of return he/she is going to receive.
- Expected return is the weighted average of possible returns, with the weights being the probabilities of occurrence.
- Formula

$$E(R) = \sum X * P(X)$$

Where X will represent the various values of return, $P(X)$ shows the probability of various return

Example

- Suppose, if you knew a given investment had a 50% chance of earning return of Rs. 10, a 25% chance of earning a return of Rs. 20 and there is a 25% chance of bearing a loss of Rs. 10. What is your expected return?

Return (X)	P(X)	$E(X) = X * P(X)$
10	0.50	5
20	0.25	5
-10	0.25	-2.5
TOTAL		7.5

Real Rate of Return

- Also called Inflation adjusted return
- Inflation adjusted return reveals the return on an investment after removing the effects of inflation.

$$\text{Inflation - Adjusted Return} = \frac{(1 + \text{Return})}{(1 + \text{Inflation Rate})} - 1$$

Example

- Return on Investment R = 7%, Inflation rate IR = 3%, Inflation Adjusted Return =?

□ Solution:

$$\begin{aligned}\text{Inflation Adjusted Return} &= [(1+R)/(1+IR)] - 1 \\ &= [(1+0.07)/(1+0.03)]-1 \\ &= 1.03883 - 1 \\ &= 0.0388 \\ &= 4\% \text{ approximately}\end{aligned}$$

$$\text{Inflation Adjusted Return} = R - IR = 7\% - 3\% = 4\%$$

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