MBA II Semester
Financial Management
Unit – 2

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TIME VALUE OF MONEY

- The time value of money (TVM) is the idea that money available at the present time is worth more than the same amount in the future due to its potential earning capacity. This core principle of finance holds that, provided money can earn interest, any amount of money is worth more the sooner it is received.
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- Which would you prefer – Rs.1,000 today or Rs.1,000 ten years from today? Common sense tells us to take the Rs.1,000 today because we recognize that there is a time value to money. The immediate receipt of Rs.1,000 provides us with the opportunity to put our money to work and earn interest. In a world in which all cash flows are certain, the rate of interest can be used to express the time value of money.
- Most financial decisions, personal as well as business, involve time value of money considerations.

Time Preference for Money

- **Time preference for money** is an individual's preference for possession of a given amount of money *now*, rather than the same amount at some future time.
- Three reasons may be attributed to the individual's time preference for money:
  - risk
  - preference for consumption
  - investment opportunities

Required Rate of Return

- The time preference for money is generally expressed by an interest rate. This rate will be positive even in the absence of any risk. It may be therefore called the **risk-free rate.**
- An investor requires compensation for assuming risk, which is called **risk premium**.
- The investor's **required rate of return** is:

  Risk-free rate + Risk premium.

Time Value Adjustment

- Two most common methods of adjusting cash flows for time value of money:
  - **Compounding**—the process of calculating **future values** of cash flows and
  - **Discounting**—the process of calculating **present values** of cash flows.

INTEREST

INTEREST : - Money paid (earned) for the use of money.

Interest can be calculated in two ways:

1. **SIMPLE INTEREST**
2. **COMPOUND INTEREST**

SIMPLE INTEREST

- Simple interest is interest that is paid (earned) on only the original amount, or principal, borrowed (lent). The amount of simple interest is a function of three variables: the original amount borrowed (lent), or principal; the interest rate per time period; and the number of time periods for which the principal is borrowed (lent).

The formula for calculating simple interest is

$$I = P_o \times i \times n$$

$$I = 15000 \times .08 \times 3 = 3600$$

$$I = 240000 \times .12 \times 2 = 57600$$

Where

I = simple interest in Amount

P_o = Principal, or original amount borrowed (lent) at time period 0

i = interest rate per time period

n = number of time periods

SIMPLE INTEREST

For example,

- Assume that you deposit Rs.100 in a savings account paying 8 percent simple interest and keep it there for 10 years.
- At the end of 10 years, the amount of interest accumulated is determined as follows:
- Interest = Rs.100x(0.08)x(10) = Rs.80

COMPOUND INTEREST

- **COMPOUND INTEREST:-** Interest paid (earned) on any previous interest earned as well as the original amount or principal borrowed (lent).

$$CI_n = P_o \times (1 + i)^n$$

CI one year = 100 x (1.+0.08) =100 x 1.08

CI=108

CI After 2 years = $100\ (1+0.8)^2$

CI after 2 Years = 100 x 1.08 x 1.08 = 116.64

CI after 3 Years = 100 x 1.08 x 1.08 x 1.08 = 125.97

Where

CI_n = Compound Amount with Interest

P_o = Principal, or original amount borrowed (lent) at time period 0

i = interest rate per time period

n = number of time periods

Future Value

- **Compounding** is the process of finding the future values of cash flows by applying the concept of compound interest.
- The general form of equation for calculating the future value of a lump sum after *n* periods may, therefore, be written as follows:

$$F_n = P(1+i)^n$$

- The term $(1 + i)^n$ is the **compound value factor** (*CVF*) of a lump sum of Re 1, and it always has a value greater than 1 for positive *i*, indicating that *CVF* increases as *i* and *n* increase.

$$F_n = P \times \mathrm{CVF}_{n,i}$$

FUTURE VALUE (Terminal value or Compound Value)

- Consider a person who deposits Rs.100 into a savings account. If the interest rate is 8 percent, compounded annually, how much will the Rs.100 be worth at the end of a year?
- Setting up the problem, we solve for the future value (which in this case is also referred to as the compound value) of the account at the end of the year (FV1).

$$FV1 = P_o (1 + i)$$

$$= Rs.100 \times (1 + .08) =$$

$$= Rs.108$$

FUTURE VALUE (Terminal value or Compound Value)

- Interestingly, this first-year value is the same number that we would get if simple interest were employed. But this is where the similarity ends. What if we leave Rs.100 on deposit for two years?
- The Rs.100 initial deposit will have grown to Rs.108 at the end of the first year at 8 percent compound annual interest. Going to the end of the second year, Rs.108 becomes Rs.116.64, as Rs.8 in interest is earned on the initial Rs.100, and Rs.0.64 is earned on the Rs.8 in interest credited to our account at the end of the first year. In other words, interest is earned on previously earned interest – hence the name compound interest.

Therefore, the future value at the end of the second year is

$$FV_2 = FV1(1 + i) = P_o \times (1 + i) \times (1 + i)$$

$= P_o (1 + i)^2 = Rs.108(1.08) = Rs.100(1.08)(1.08) = Rs.100(1.08)2 = Rs.116.64$

At the end of three years, the account would be worth

$FV3 = FV2(1 + i) = FV1(1 + i)(1 + i)$

$= P_o (1 + i)^3 = Rs.116.64(1.08) = Rs.108(1.08)(1.08) = Rs.100(1.08)3 = Rs.125.97$

FUTURE VALUE (Terminal value or Compound Value)

- In general, **FVn, the future (compound) value of a deposit at the end of n periods, is**

$$FV_n = P_o \times (1 + i)^n$$

Where:

FV_n = Future value after $_n$ years / periods

P_o = Principal or original amount borrowed (lent).

i = Interest rate

^{n} = Number of years

or

FVn = P_o (FVIF i,n)

where we let FVIFi,n (i.e., the future value interest factor at i% for n periods) equal (1 + i)n.

FV Factor of Re.1 @ 8% for 10 Years = 2.15892

FV of Rs. 5000 @ 8% for 10 Years = 2.15892 x 5000 = 10794.6

FUTURE VALUE TABLE

FUTURE VALUE OF $1

Periods	RATE PER PERIOD																
	0.25%	0.50%	0.75%	1.00%	1.50%	2.00%	2.50%	3.00%	4.00%	5.00%	6.00%	7.00%	8.00%	9.00%	10.00%	11.00%	12.00%
1	1.00250	1.00500	1.00750	1.01000	1.01500	1.02000	1.02500	1.03000	1.04000	1.05000	1.06000	1.07000	1.08000	1.09000	1.10000	1.11000	1.12000
2	1.00501	1.01003	1.01506	1.02010	1.03023	1.04040	1.05063	1.06090	1.08160	1.10250	1.12360	1.14490	1.16640	1.18810	1.21000	1.23210	1.25440
3	1.00752	1.01508	1.02267	1.03030	1.04568	1.06121	1.07689	1.09273	1.12486	1.15763	1.19102	1.22504	1.25971	1.29503	1.33100	1.36763	1.40493
4	1.01004	1.02015	1.03034	1.04060	1.06136	1.08243	1.10381	1.12551	1.16986	1.21551	1.26248	1.31080	1.36049	1.41158	1.46410	1.51807	1.57352
5	1.01256	1.02525	1.03807	1.05101	1.07728	1.10408	1.13141	1.15927	1.21665	1.27628	1.33823	1.40255	1.46933	1.53862	1.61051	1.68506	1.76234
6	1.01509	1.03038	1.04585	1.06152	1.09344	1.12616	1.15969	1.19405	1.26532	1.34010	1.41852	1.50073	1.58687	1.67710	1.77156	1.87041	1.97382
7	1.01763	1.03553	1.05370	1.07214	1.10984	1.14869	1.18869	1.22987	1.31593	1.40710	1.50363	1.60578	1.71382	1.82804	1.94872	2.07616	2.21068
8	1.02018	1.04071	1.06160	1.08286	1.12649	1.17166	1.21840	1.26677	1.36857	1.47746	1.59385	1.71819	1.85093	1.99256	2.14359	2.30454	2.47596
9	1.02273	1.04591	1.06956	1.09369	1.14339	1.19509	1.24886	1.30477	1.42331	1.55133	1.68948	1.83846	1.99900	2.17189	2.35795	2.55804	2.77308
10	1.02528	1.05114	1.07758	1.10462	1.16054	1.21899	1.28008	1.34392	1.48024	1.62889	1.79085	1.96715	2.15892	2.36736	2.59374	2.83942	3.10585
11	1.02785	1.05640	1.08566	1.11567	1.17795	1.24337	1.31209	1.38423	1.53945	1.71034	1.89830	2.10485	2.33164	2.58043	2.85312	3.15176	3.47855
12	1.03042	1.06168	1.09381	1.12683	1.19562	1.26824	1.34489	1.42576	1.60103	1.79586	2.01220	2.25219	2.51817	2.81266	3.13843	3.49845	3.89598
13	1.03299	1.06699	1.10201	1.13809	1.21355	1.29361	1.37851	1.46853	1.66507	1.88565	2.13293	2.40985	2.71962	3.06580	3.45227	3.88328	4.36349
14	1.03557	1.07232	1.11028	1.14947	1.23176	1.31948	1.41297	1.51259	1.73168	1.97993	2.26090	2.57853	2.93719	3.34173	3.79750	4.31044	4.88711
15	1.03816	1.07768	1.11860	1.16097	1.25023	1.34587	1.44830	1.55797	1.80094	2.07893	2.39656	2.75903	3.17217	3.64248	4.17725	4.78459	5.47357
16	1.04076	1.08307	1.12699	1.17258	1.26899	1.37279	1.48451	1.60471	1.87298	2.18287	2.54035	2.95216	3.42594	3.97031	4.59497	5.31089	6.13039
17	1.04336	1.08849	1.13544	1.18430	1.28802	1.40024	1.52162	1.65285	1.94790	2.29202	2.69277	3.15882	3.70002	4.32763	5.05447	5.89509	6.86604
18	1.04597	1.09393	1.14396	1.19615	1.30734	1.42825	1.55966	1.70243	2.02582	2.40662	2.85434	3.37993	3.99602	4.71712	5.55992	6.54355	7.68997
19	1.04858	1.09940	1.15254	1.20811	1.32695	1.45681	1.59865	1.75351	2.10685	2.52695	3.02560	3.61653	4.31570	5.14166	6.11591	7.26334	8.61276
20	1.05121	1.10490	1.16118	1.22019	1.34686	1.48595	1.63862	1.80611	2.19112	2.65330	3.20714	3.86968	4.66096	5.60441	6.72750	8.06231	9.64629
21	1.05383	1.11042	1.16989	1.23239	1.36706	1.51567	1.67958	1.86029	2.27877	2.78596	3.39956	4.14056	5.03383	6.10881	7.40025	8.94917	10.80385
22	1.05647	1.11597	1.17867	1.24472	1.38756	1.54598	1.72157	1.91610	2.36992	2.92526	3.60354	4.43040	5.43654	6.65860	8.14027	9.93357	12.10031
23	1.05911	1.12155	1.18751	1.25716	1.40838	1.57690	1.76461	1.97359	2.46472	3.07152	3.81975	4.74053	5.87146	7.25787	8.95430	11.02627	13.55235
24	1.06176	1.12716	1.19641	1.26973	1.42950	1.60844	1.80873	2.03279	2.56330	3.22510	4.04893	5.07237	6.34118	7.91108	9.84973	12.23916	15.17863
25	1.06441	1.13280	1.20539	1.28243	1.45095	1.64061	1.85394	2.09378	2.66584	3.38635	4.29187	5.42743	6.84848	8.62308	10.83471	13.58546	17.00006

Present Value

- **Present value** of a future cash flow (inflow or outflow) is the amount of current cash that is of equivalent value to the decision-maker.

- **Discounting** is the process of determining present value of a series of future cash flows.

Discount Rate (capitalization rate)

- Interest rate used to convert future values to present values.

Present Value of a Single Cash Flow

- The following general formula can be employed to calculate the present value of a lump sum to be received after some future periods:

$$P = \frac{F_n}{(1+i)^n} = F_n\left[(1+i)^{-n}\right]$$

- PV = 1 x $\frac{1}{(1+i)^n}$
- The term in parentheses is the **discount factor** or **present value factor** (*PVF*), and it is always less than 1.0 for positive *i*, indicating that a future amount has a smaller present value.

$$PV = F_n \times \mathrm{PVF}_{n,i}$$

Present Value Tables

Formula: $PV = 1 / (1 + i)^n$

n / i	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091	0.9009	0.8929	0.8850	0.8772	0.8696
2	0.9803	0.9612	0.9426	0.9246	0.9070	0.8900	0.8734	0.8573	0.8417	0.8264	0.8116	0.7972	0.7831	0.7695	0.7561
3	0.9706	0.9423	0.9151	0.8890	0.8638	0.8396	0.8163	0.7938	0.7722	0.7513	0.7312	0.7118	0.6931	0.6750	0.6575
4	0.9610	0.9238	0.8885	0.8548	0.8227	0.7921	0.7629	0.7350	0.7084	0.6830	0.6587	0.6355	0.6133	0.5921	0.5718
5	0.9515	0.9057	0.8626	0.8219	0.7835	0.7473	0.7130	0.6806	0.6499	0.6209	0.5935	0.5674	0.5428	0.5194	0.4972
6	0.9420	0.8880	0.8375	0.7903	0.7462	0.7050	0.6663	0.6302	0.5963	0.5645	0.5346	0.5066	0.4803	0.4556	0.4323
7	0.9327	0.8706	0.8131	0.7599	0.7107	0.6651	0.6227	0.5835	0.5470	0.5132	0.4817	0.4523	0.4251	0.3996	0.3759
8	0.9235	0.8535	0.7894	0.7307	0.6768	0.6274	0.5820	0.5403	0.5019	0.4665	0.4339	0.4039	0.3762	0.3506	0.3269
9	0.9143	0.8368	0.7664	0.7026	0.6446	0.5919	0.5439	0.5002	0.4604	0.4241	0.3909	0.3606	0.3329	0.3075	0.2843
10	0.9053	0.8203	0.7441	0.6756	0.6139	0.5584	0.5083	0.4632	0.4224	0.3855	0.3522	0.3220	0.2946	0.2697	0.2472
11	0.8963	0.8043	0.7224	0.6496	0.5847	0.5268	0.4751	0.4289	0.3875	0.3505	0.3173	0.2875	0.2607	0.2366	0.2149
12	0.8874	0.7885	0.7014	0.6246	0.5568	0.4970	0.4440	0.3971	0.3555	0.3186	0.2858	0.2567	0.2307	0.2076	0.1869
13	0.8787	0.7730	0.6810	0.6006	0.5303	0.4688	0.4150	0.3677	0.3262	0.2897	0.2575	0.2292	0.2042	0.1821	0.1625
14	0.8700	0.7579	0.6611	0.5775	0.5051	0.4423	0.3878	0.3405	0.2992	0.2633	0.2320	0.2046	0.1807	0.1597	0.1413
15	0.8613	0.7430	0.6419	0.5553	0.4810	0.4173	0.3624	0.3152	0.2745	0.2394	0.2090	0.1827	0.1599	0.1401	0.1229
16	0.8528	0.7284	0.6232	0.5339	0.4581	0.3936	0.3387	0.2919	0.2519	0.2176	0.1883	0.1631	0.1415	0.1229	0.1069
17	0.8444	0.7142	0.6050	0.5134	0.4363	0.3714	0.3166	0.2703	0.2311	0.1978	0.1696	0.1456	0.1252	0.1078	0.0929
18	0.8360	0.7002	0.5874	0.4936	0.4155	0.3503	0.2959	0.2502	0.2120	0.1799	0.1528	0.1300	0.1108	0.0946	0.0808
19	0.8277	0.6864	0.5703	0.4746	0.3957	0.3305	0.2765	0.2317	0.1945	0.1635	0.1377	0.1161	0.0981	0.0829	0.0703
20	0.8195	0.6730	0.5537	0.4564	0.3769	0.3118	0.2584	0.2145	0.1784	0.1486	0.1240	0.1037	0.0868	0.0728	0.0611

Example

- Suppose that an investor wants to find out the present value of Rs 50,000 to be received after 15 years. Her interest rate is 9 percent. First, we will find out the present value factor, which is 0.275. Multiplying 0.275 by Rs 50,000, we obtain Rs 13,750 as the present value:

$$PV = 50{,}000 \times PVF_{15,\ 0.09} = 50{,}000 \times 0.275 = \text{Rs } 13{,}750$$

PRESENT VALUE (PV)

- **PRESENT VALUE (PV)**:- The current value of a future amount of money, or a series of payments, evaluated at a given interest rate.

$$PV_0 = FV_n \left(\frac{1}{1+i} \right)^n$$

Where :

PVo = Present Value

FVn = Future Amount of money

i = Interest rate

n = Number of years

OR

$$P\,V_0 = F\,V_n(PVIF_{i,n})$$

Compounding More Than Once a Year:

- If interest is compounded more than once a year, the effective interest rate will be higher than the nominal rate.
- The general formula for solving for the future value at the end of n years where interest is paid m times a year is

$$FV_n = PV_0(1 + [i/m])^{mn}$$

- To illustrate, suppose that now interest is paid quarterly and that you wish to know the future value of Rs. 100 at the end of one year where the stated annual rate is 8 percent. The future value would be
- FV_1 = Rs. $100(1 + [0.08/4])^{(4)(1)}$
- = Rs. $100(1 + 0.02)^4$ = **Rs. 108.24**

Sinking Fund

- **Sinking fund** is a fund, which is created out of fixed payments each period to accumulate to a future sum after a specified period. For example, companies generally create sinking funds to retire bonds (debentures) on maturity.
- The factor used to calculate the annuity for a given future sum is called the *sinking fund factor* (*SFF*).

$$A = F_n \left[\frac{i}{(1+i)^n - 1} \right]$$

Present Value of an Annuity

- The computation of the present value of an annuity can be written in the following general form:

$$P = A\left[\frac{1}{i} - \frac{1}{i(1+i)^n}\right]$$

- The term within parentheses is the **present value factor of an annuity** of Re 1, which we would call *PVFA*, and it is a sum of single-payment present value factors.

$$P = A \times \text{PVAF}_{n,i}$$

Capital Recovery and Loan Amortisation

- **Capital recovery** is the annuity of an investment made today for a specified period of time at a given rate of interest. Capital recovery factor helps in the preparation of a **loan amortisation** (**loan repayment**) **schedule**.

$$A = P\left[\frac{1}{\mathrm{PVAF}_{n,i}}\right]$$

$$A = P \times \mathrm{CRF}_{n,i}$$

Present Value of an Uneven Periodic Sum

- Investments made by of a firm do not frequently yield constant periodic cash flows (annuity). In most instances the firm receives a stream of uneven cash flows. Thus the present value factors for an annuity cannot be used. The procedure is to calculate the present value of each cash flow and aggregate all present values.

Present Value of Perpetuity

- **Perpetuity** is an annuity that occurs *indefinitely*. Perpetuities are not very common in financial decision-making:

$$\text{Present value of a perpetuity} = \frac{\text{Perpetuity}}{\text{Interest rate}}$$

Present Value of Growing Annuities

- The present value of a constantly growing annuity is given below:

$$P = \frac{A}{i-g}\left[1-\left(\frac{1+g}{1+i}\right)^{n}\right]$$

- Present value of a constantly growing perpetuity is given by a simple formula as follows:

$$P = \frac{A}{i-g}$$

Value of an Annuity Due

- **Annuity due** is a series of fixed receipts or payments *starting at the beginning of each period* for a specified number of periods.
- **Future Value of an Annuity Due**

$$F_n = A \times \text{CVFA}_{n,i} \times (1+i)$$

- **Present Value of an Annuity Due**

$$P = A \times \text{PVFA}_{n,i} \times (1+i)$$

What Is a Security?

The term "security" refers to a fungible, negotiable financial instrument that holds some type of monetary value. It represents an ownership position in a publicly-traded corporation via stock; a creditor relationship with a governmental body or a corporation represented by owning that entity's bond

Securities are fungible and tradable financial instruments used to raise capital in public and private markets.

Securities can be broadly categorized into two distinct types: equities and debts. However, some hybrid securities combine elements of both equities and debts.

There are primarily three types of securities: equity—which provides ownership rights to holders; debt—essentially loans repaid with periodic payments; and hybrids—which combine aspects of debt and equity.

Security Valuation

Security valuation is important to decide on the portfolio of an investor. All investment decisions are to be made on a scientific analysis of the right price of a share. Hence, an understanding of the valuation of securities is essential. Investors should buy underpriced shares and sell overpriced shares. Share pricing is thus an important aspect of trading. Conceptually, four types of valuation models are discernible.

(i) Book value,

(ii) Liquidating value,

(iii) Intrinsic value,

(iv) Replacement value as compared to market price.

Security Valuation

(i) Book Value:

Book value of a security is an accounting concept. The book value of an equity share is equal to the net worth of the firm divided by the number of equity shares, where the net worth is equal to equity capital plus free reserves. The market value may fluctuate around the book value but may be higher if the future prospects are good.

(ii) Liquidating Value (Breakdown Value):

If the assets are valued at their breakdown value in the market and take net fixed assets plus current assets minus current liabilities as if the company is liquidated, then divide this by the number of shares, the resultant value is the liquidating value per share. This is also an accounting concept.

Security Valuation

(iii) Intrinsic Value:

Market value of a security is the price at which the security is traded in the market and it is generally hovering around its intrinsic value. There are different schools of thought regarding the relationship of intrinsic value to the market price. Market prices are those which rule in the market, resulting from the demand and supply forces. Intrinsic price is the true value of the share, which depends on its earning capacity and its true worth. According to the fundamentalist approach to security valuation, the value of the security must be equal to the discounted value of the future income stream. The investor buys the securities when the market price is below this value.

Thus, for fundamentalists, earnings and dividends are the essential ingredients in determining the market value of a security. The discount rate used in such present value calculations is known as the required rate or return. Using this discount rate all future earnings are discounted back to the present to determine the intrinsic value.

Security Valuation

According to the technical school, the price of a security is determined by the market demand and supply and it has very little to do with intrinsic values. The price movements follow certain trends for varying periods of time. Changes in trend represent the shifts in demand and supply which are predictable. The present trends are the offshoot of the past and history repeats itself according to this school.

According to efficient market hypothesis, in a fairly large security market where competitive conditions prevail, market prices are good proxies for intrinsic values. The security prices are determined after absorbing all the information available to market participants. A share is thus generally worth whatever it is selling for in the market.

Generally, fundamental school is the basis for security valuation and many models are in use, based on these tenets.

Security Valuation

(iv) Replacement Value:

When the company is liquidated and its assets are to be replaced by new ones, their prices being higher, the replacement value of a share will be different from the Breakdown value. Some analysts take this replacement value to compare with the market price.

Ordinary Shares or Equity Shares

Features

- Claim on Income
- Claim on Assets
- Right to Control
- Voting Rights
- Pre-Emptive Rights
- Limited Liability

Ordinary Shares–Pros and Cons

- Advantages
  1. Permanent Capital
  2. Borrowing Base
  3. Dividend Payment Discretion
- Disadvantages
  1. Cost
  2. Risk
  3. Earnings Dilution
  4. Ownership Dilution

Debentures–Features

- Interest Rate
- Maturity
- Redemption
- Sinking Fund
- Buy-back (call) provisions
- Indenture
- Security
- Yield
- Claim on Assets and Income

Types of Debentures

- Non – Convertible Debentures
- Fully – Convertible Debentures
- Partly – Convertible Debentures

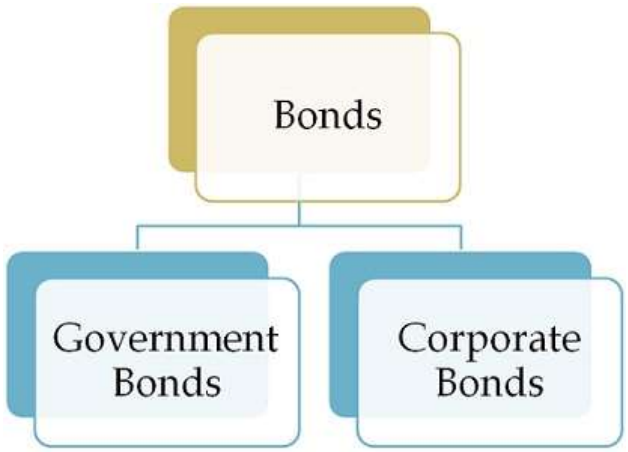
Debentures–Pros and Cons

- Advantages
  1. Less Costly
  2. No ownership Dilution
  3. Fixed payment of interest
  4. Reduced real obligation
- Disadvantages
  1. Obligatory Payment
  2. Financial Risk
  3. Cash outflows
  4. Restricted Covenants

Bond

Definition:

- Bonds can be defined as the negotiable instrument, issued in relation to borrowing arrangement, that indicates indebtedness. It is a debt instrument, in which the bond investor extends credit to the issuer, which in turn commits to repay the loan amount on the specified maturity date, along with interest throughout the life of the bond. The issuer can be the municipal corporation, government or company.



Bond Market in India

- In India, bonds are issued by the Government as well as the private-sector entities, to raise money for a specific purpose. They are essentially interest-bearing debt certificates.
- **Corporate & PSU Bonds :** Corporate Bonds are issued by Public Sector Undertakings (PSUs) and private corporations. These bonds are issued for a wide range of tenor normally; say for a period of 1 year to 15 years or even more. As compared to Government Securities which are nearly free of default risk; corporate bonds may turn out to be risky.
- The Indian bond market comprises of both Government and Private sector bonds but is mainly dominated by government bonds. Government bonds are considered highly secure and enjoy excellent liquidity.

Characteristics of a Bond

1. A bond is generally a form of debt which the investors pay to the issuers for a defined time frame. In a layman's language, bond holders offer credit to the company issuing the bond.
2. Bonds generally have a fixed maturity date.
3. All bonds repay the principal amount after the maturity date.
4. Bonds are like a loan which carries an interest rate (coupon) and must be repaid on a specified date.
5. Bonds have a specified maturity period upon completion of which the borrower (Government or Private Corporation) will return the money to the bond holder.

Bond Terminology

1. Par Value

The par value is also known as the face value of the bond, which is the amount that is returned to the investor when the bond matures. For example, if a bond is bought at issuance for Rs. 1,000, the investor bought the bond at its par value. At the maturity date, the investor will get back the Rs. 1,000.

2. Discount

Bonds do not necessarily trade at their par values. They may trade above or below their par values. Any bond trading below its face value is said to be trading at a discount.

3. Premium

Bonds may trade at a premium, that is, more than its face value . For example, a bond trading at Rs.1,080 is said to be trading at an Rs. 80 premium per bond.

Bond Terminology

4. Coupon Rate and Coupon

The coupon rate is the interest rate that the issuer of the bond promises to pay the bondholder. If the coupon rate is 5%, the issuer of the bonds promises to pay Rs. 50 in interest on each bond per year (5% x 1,000).

5. Maturity

The maturity of a bond is the length of time until the bond comes due and the bondholder receives the par value of the bond. For example, medium-term notes generally mature in one to less than ten years, while long-term bonds mature in ten years or longer.

6. Maturity Date

Maturity Date is the date at which the bond gets matured, and the principal amount is paid to the bondholder.

7. Redemption Value

Redemption Value is the value paid to the bondholder, at the time of expiry of the term for which bond is issued.

Different Types of Bonds

There are different types of bonds that you can invest in.

(i) Government Bonds:

Known popularly as 'Sovereign Debt', government bonds are issued by the Central Government to raise money from the general public. It is a risk-free investment that offers stable returns and is suitable for investors with a low-risk appetite.

(ii) Municipal Bonds:

Municipal bonds are issued by the State government or the local government agencies to raise money to fund government activities. These bonds are also considered a safe investment option as they are backed by the State Government.

(iii) Corporate Bonds:

Large financial corporations and financial institutions issue corporate bonds. They yield higher returns, but the risk factor is also high. The maturity period on these bonds can go up to around twelve years. It is essential that you do a background check on the company or ascertain its reliability before investing any money.

Different Types of Bonds

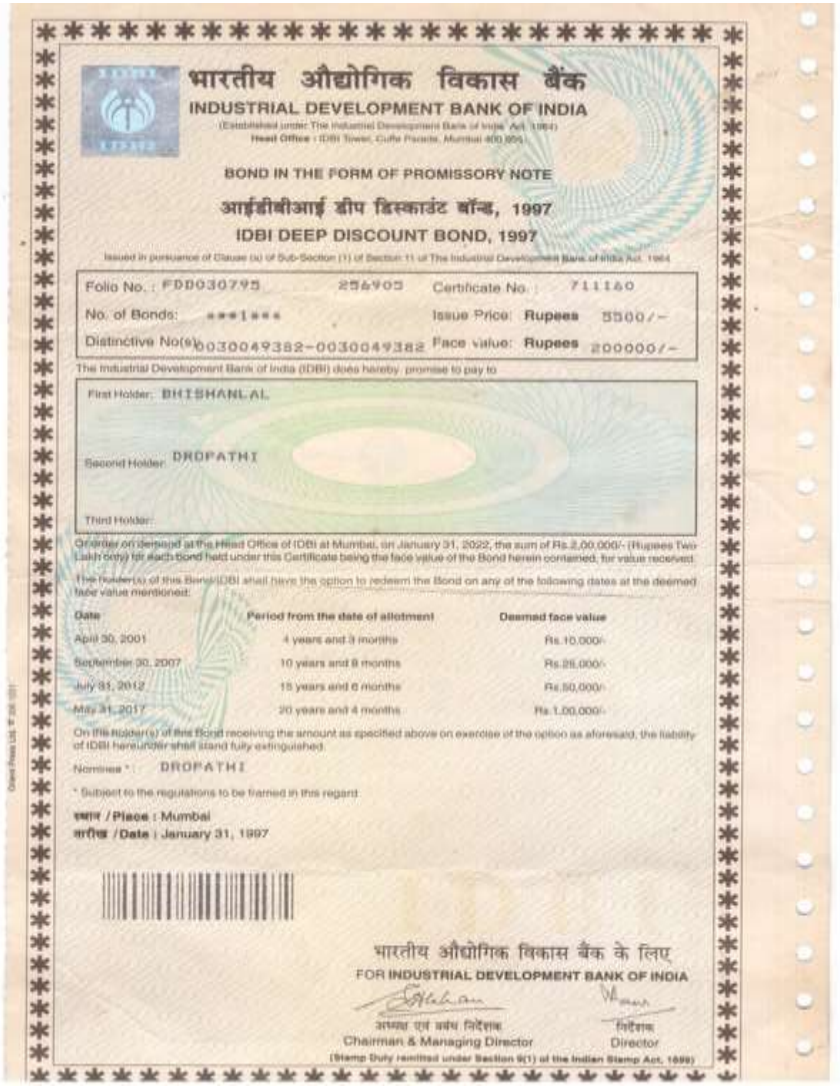
(iv) Public Sector Bonds:

These bonds are issued by Public sector corporations, where the share of the Central Government is more than 50%. These bonds are implicitly guaranteed by the Union Government and are considered a safe investment option.

(v) High Yield Bonds:

These bonds are issued by companies who have just entered the market and are yet to establish themselves in the market. These bonds offer high returns but have a high-risk factor too. They are meant for investors with a high-risk appetite.

Certificate of a Bond issued by IDBI



भारतीय औद्योगिक विकास बैंक

INDUSTRIAL DEVELOPMENT BANK OF INDIA

(Established under The Industrial Development Bank of India Act, 1964)

Head Office : IDBI Tower, Cuffe Parade, Mumbai 400 005

BOND IN THE FORM OF PROMISSORY NOTE

आईडीबीआई डीप डिस्काउंट बॉन्ड, 1997

IDBI DEEP DISCOUNT BOND, 1997

Issued in pursuance of Clause (a) of Sub-Section (1) of Section 11 of The Industrial Development Bank of India Act, 1964

Folio No. : FDD030795 256905 Certificate No. 711160

No. of Bonds: ***1*** Issue Price: Rupees 5500/-

Distinctive No(s) 0030049382-0030049382 Face value: Rupees 200000/-

The Industrial Development Bank of India (IDBI) does hereby promise to pay to

First Holder: BHISHANLAL

Second Holder: DROPATHI

Third Holder:

On order on demand at the Head Office of IDBI at Mumbai, on January 31, 2022, the sum of Rs.2,00,000/- (Rupees Two Lakh only) for each Bond held under this Certificate being the face value of the Bond herein contained, for value received.

The holder(s) of this Bond/IDBI shall have the option to redeem the Bond on any of the following dates at the deemed face value mentioned:

Date	Period from the date of allotment	Deemed face value
April 30, 2001	4 years and 3 months	Rs.10,000/-
September 30, 2007	10 years and 8 months	Rs.25,000/-
July 31, 2012	15 years and 6 months	Rs.50,000/-
May 31, 2017	20 years and 4 months	Rs.1,00,000/-

On the holder(s) of the Bond receiving the amount as specified above on exercise of the option as aforesaid, the liability of IDBI hereunder shall stand fully extinguished.

Nominee * : DROPATHI

* Subject to the regulations to be framed in this regard

स्थान / Place : Mumbai

तारीख / Date : January 31, 1997

भारतीय औद्योगिक विकास बैंक के लिए

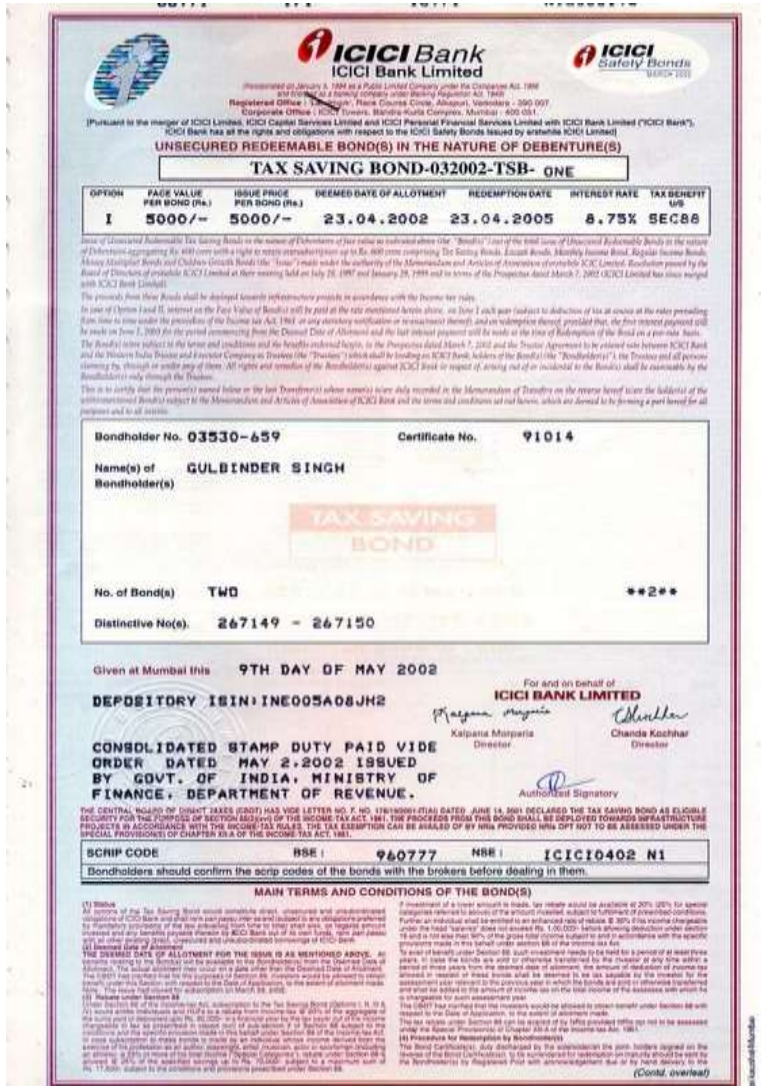
FOR INDUSTRIAL DEVELOPMENT BANK OF INDIA

अध्यक्ष एवं प्रबंध निदेशक
Chairman & Managing Director

निदेशक
Director

(Stamp Duty remitted under Section 9(1) of the Indian Stamp Act, 1899)

Certificate of a Tax Saving Bond issued by ICICI Bank Ltd.



ICICI Bank
ICICI Bank Limited

ICICI Safety Bonds

UNSECURED REDEEMABLE BOND(S) IN THE NATURE OF DEBENTURE(S)

TAX SAVING BOND-032002-TSB- ONE

OPTION	FACE VALUE PER BOND (Rs.)	ISSUE PRICE PER BOND (Rs.)	DEEMED DATE OF ALLOTMENT	REDEMPTION DATE	INTEREST RATE	TAX BENEFIT U/S
I	5000/-	5000/-	23.04.2002	23.04.2005	8.75%	SEC88

Bondholder No. 03530-659 Certificate No. 91014

Name(s) of Bondholder(s) GULBINDER SINGH

No. of Bond(s) TWO **2**

Distinctive No(s). 267149 - 267150

Given at Mumbai this 9TH DAY OF MAY 2002

For and on behalf of ICICI BANK LIMITED

Kalpana Morparia, Director — Chanda Kochhar, Director

Authorised Signatory

DEPOSITORY ISIN: INE005A08JH2

CONSOLIDATED STAMP DUTY PAID VIDE ORDER DATED MAY 2.2002 ISSUED BY GOVT. OF INDIA. MINISTRY OF FINANCE. DEPARTMENT OF REVENUE.

THE CENTRAL BOARD OF DIRECT TAXES (CBDT) HAS VIDE LETTER NO. F. NO. 178/19/2001-ITA(i) DATED JUNE 14, 2001 DECLARED THE TAX SAVING BOND AS ELIGIBLE SECURITY FOR THE PURPOSES OF SECTION 88(2)(xvii) OF THE INCOME-TAX ACT, 1961. THE PROCEEDS FROM THIS BOND SHALL BE DEPLOYED TOWARDS INFRASTRUCTURE PROJECTS IN ACCORDANCE WITH THE INCOME-TAX RULES. THE TAX EXEMPTION CAN BE AVAILED OF BY NRIs PROVIDED NRIs OPT NOT TO BE ASSESSED UNDER THE SPECIAL PROVISION(S) OF CHAPTER XX-A OF THE INCOME-TAX ACT, 1961.

SCRIP CODE	BSE :	960777	NSE :	ICICI0402 N1

Bondholders should confirm the scrip codes of the bonds with the brokers before dealing in them.

MAIN TERMS AND CONDITIONS OF THE BOND(S)

(Contd. overleaf)

Features of a Bond

- Face Value
- Interest Rate—fixed or floating
- Maturity
- Redemption value
- Market Value

Bond with Maturity

Bond value = Present value of interest + Present value of maturity value:

$$B_0 = \sum_{t=1}^{n} \frac{\text{INT}_t}{(1+k_d)^t} + \frac{B_n}{(1+k_d)^n}$$

Perpetual Bonds

- **Perpetual bonds**, also called *consols*, has an indefinite life and therefore, it has no maturity value. Perpetual bonds or debentures are rarely found in practice.

Perpetual Bonds

- Suppose that a 10 per cent Rs 1,000 bond will pay Rs 100 annual interest into perpetuity. What would be its value of the bond if the market yield or interest rate were 15 per cent?
- The value of the bond is determined as follows:

$$B_0 = \frac{\text{INT}}{k_d} = \frac{100}{0.15} = \text{Rs } 667$$

Bond Returns

Bonds and debentures are terms used interchangeably, Both represent long term fixed income securities. The cash flow stream (in form of interest and principal) as well as the time horizon (i.e. the date of maturity) are well specified and fixed

Bond returns can be calculated in various ways

- Coupon rate
- Current yield
- Spot interest rate
- Yield to maturity (YTM)
- Yield to call (YTC)

Current Yield

- Current yield is the annual interest divided by the bond's current value.
- **Example:** The annual interest is Rs 60 on the *current* investment of Rs 883.40. Therefore, the current rate of return or the **current yield** is: 60/883.40 = 6.8 per cent.
- Current yield does not account for the capital gain or loss.

Yield to Maturity

- The **yield-to-maturity** (*YTM*) is the measure of a bond's rate of return that considers both the interest income and any capital gain or loss. *YTM* is bond's internal rate of return.
- A perpetual bond's yield-to-maturity:

$$B_0 = \sum_{t=1}^{n=\infty} \frac{\text{INT}}{(1+k_d)^t} = \frac{\text{INT}}{k_d}$$

Preference Shares

- Similarity to Ordinary Shares:
  1. Non payment of dividends does not force company to insolvency.
  2. Dividends are not deductible for tax purposes.
  3. In some cases it has no fixed maturity dates.
- Similarity to Debentures:
  1. Dividend rate is fixed.
  2. Do not share in residual earnings.
  3. Usually do not have voting rights.

Preference Shares–Features

- Claim on Income and Assets
- Fixed Dividend
- Cumulative Dividend
- Redemption
- Sinking Fund
- Call Feature
- Participation Feature
- Voting Rights
- Convertibility

Preference Shares–Pros and Cons

- Advantages
  1. Risk less Leverage advantage
  2. Dividend postponability
  3. Fixed dividend
  4. Limited Voting Rights
- Disadvantages
  1. Non-deductibility of Dividends
  2. Commitment to pay dividends

Valuation of Shares

- A company may issue two types of shares:
  - ordinary shares and
  - preference shares
- Features of Preference and Ordinary Shares
  - Claims
  - Dividend
  - Redemption
  - Conversion

Valuation of Preference Shares

- The value of the preference share would be the sum of the present values of dividends and the redemption value.
- A formula similar to the valuation of bond can be used to value preference shares with a maturity period:

$$P_0 = \sum_{t=1}^{n} \frac{\text{PDIV}_1}{(1+k_p)^t} + \frac{P_n}{(1+k_p)^n}$$

Value of a Preference Share-Example

Suppose an investor is considering the purchase of a 12-year, 10% Rs 100 par value preference share. The redemption value of the preference share on maturity is Rs 120. The investor's required rate of return is 10.5 percent. What should she be willing to pay for the share now? The investor would expect to receive Rs 10 as preference dividend each year for 12 years and Rs 110 on maturity (i.e., at the end of 12 years). We can use the present value annuity factor to value the constant stream of preference dividends and the present value factor to value the redemption payment.

$$P_0 = 10 \times \left[\frac{1}{0.105} - \frac{1}{0.105 \times (1.105)^{12}} \right] + \frac{120}{(1.105)^{12}}$$

$$= 10 \times 6.506 + 120 \times 0.302 = 65.06 + 36.24 = \text{Rs}101.30$$

Note that the present value of Rs 101.30 is a composite of the present value of dividends, Rs 65.06 and the present value of the redemption value, Rs 36.24.The Rs 100 preference share is worth Rs 101.3 today at 10.5 percent required rate of return. The investor would be better off by purchasing the share for Rs 100 today.

Valuation of Ordinary Shares

- The valuation of ordinary or equity shares is relatively more difficult.
  - The rate of dividend on equity shares is not known; also, the payment of equity dividend is *discretionary*.
  - The earnings and dividends on equity shares are generally expected to grow, unlike the interest on bonds and preference dividend.

Dividend Capitalisation

- The value of an ordinary share is determined by capitalising the future dividend stream at the opportunity cost of capital

$$P_0 = \frac{\mathrm{DIV}_1 + P_1}{1 + k_e}$$

- Single Period Valuation:
  - If the share price is expected to grow at *g* per cent, then P_1:

$$P_1 = P_0(1+g)$$

  - We obtain a simple formula for the share valuation as follows:

$$P_0 = \frac{\mathrm{DIV}_1}{k_e - g}$$

Risk

- The probability of loss is the essence of risk.

Or

The variability of returns from those that are expected.

- Risk implies the extent to which any chosen action or an inaction that may lead to a loss or some unwanted outcome.
- 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.
- 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.
- A high standard deviation indicates a lot of value volatility and therefore a high degree of risk.

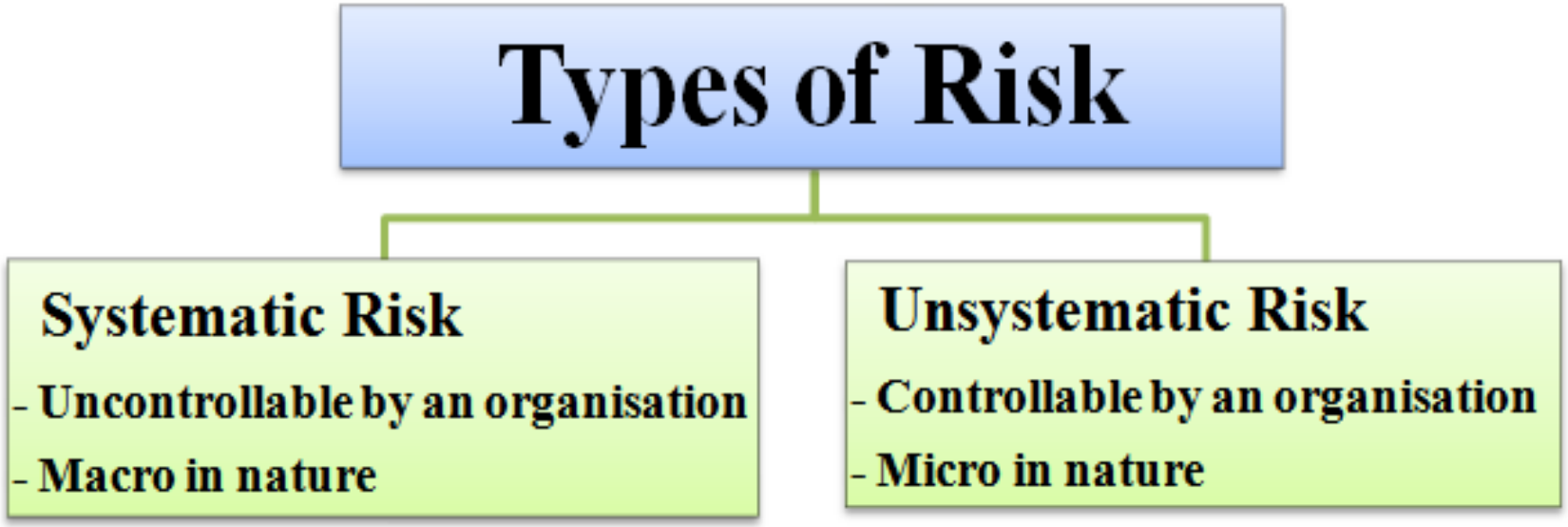
Types of Risks

In finance, different types of risk can be classified under two main groups:

1. Systematic risk.
2. Unsystematic risk.

The meaning of systematic and unsystematic risk in finance:

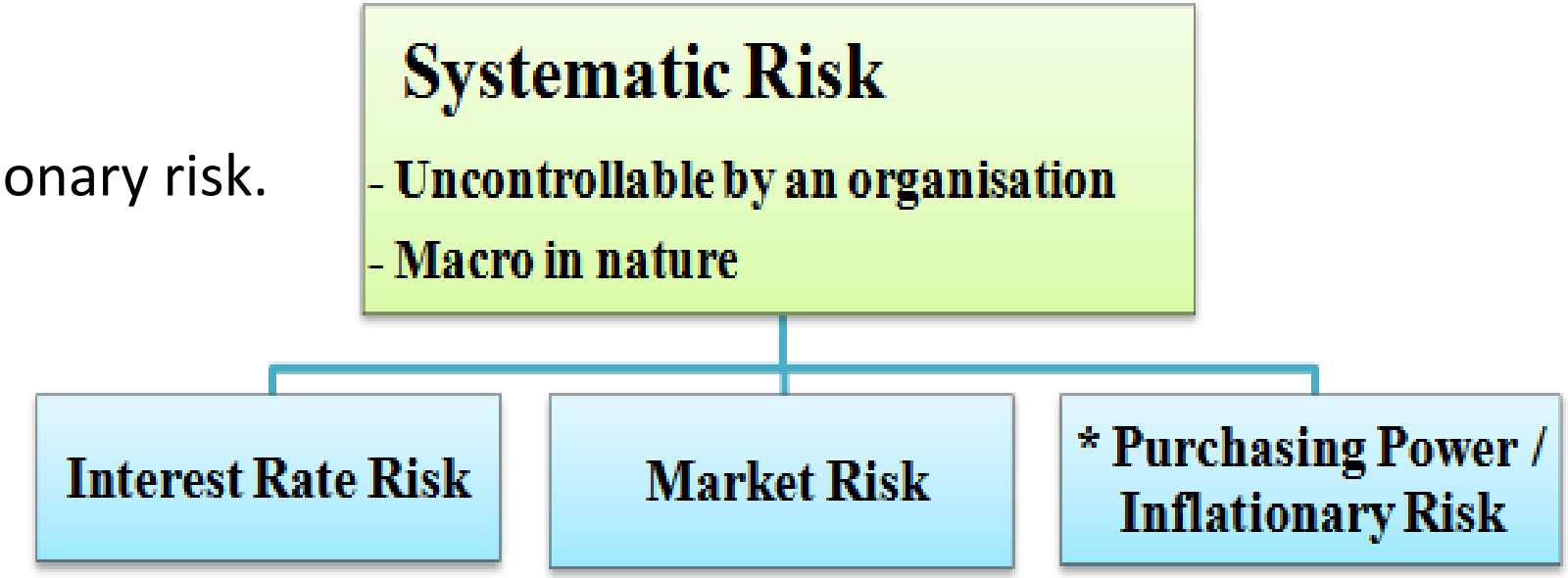
- Systematic risk is uncontrollable by an organization and macro in nature.
- Unsystematic risk is controllable by an organization and micro in nature.



A. Systematic Risk

- Systematic risk is due to the influence of external factors on an organization. Such factors are normally uncontrollable from an organization's point of view.
- It is a macro in nature as it affects a large number of organizations operating under a similar stream or same domain. It cannot be planned by the organization.
- **The types of systematic risk are depicted and listed below:**

a. Interest rate risk,
b. Market risk and
c. Purchasing power or inflationary risk.



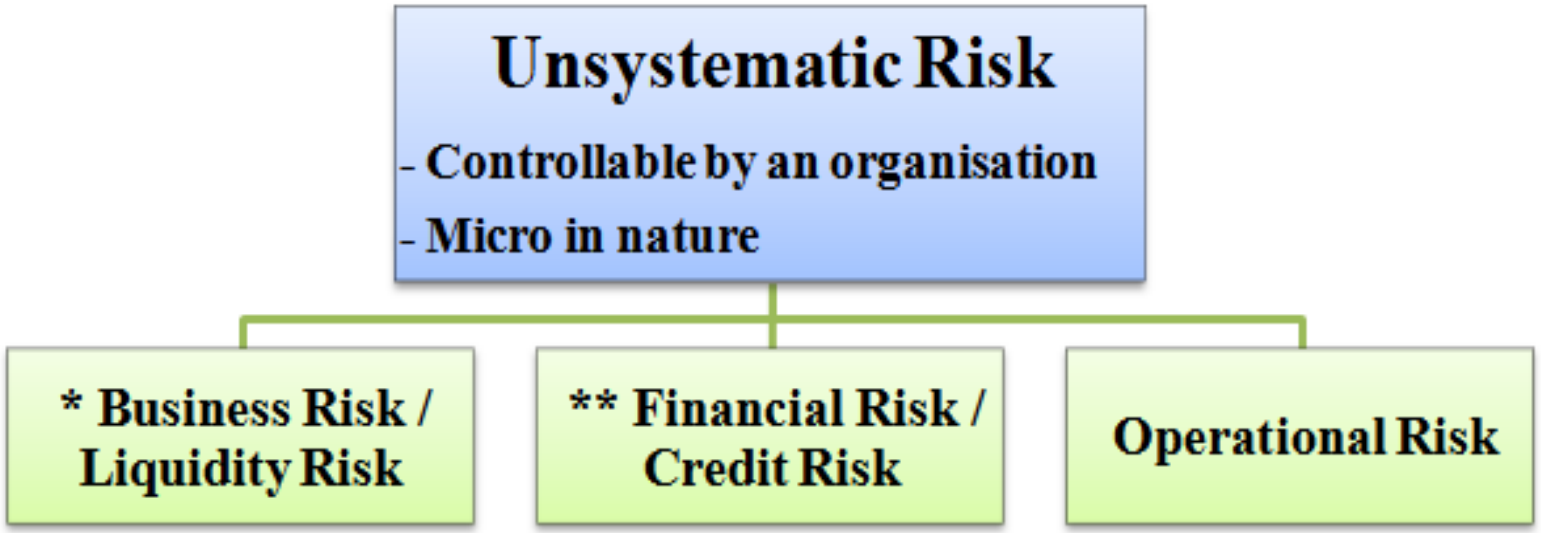
* Note: In context of types of risk in finance, purchasing power risk and inflationary risk are same.

B. Unsystematic Risk

- Unsystematic risk is due to the influence of internal factors prevailing within an organization. Such factors are normally controllable from an organization's point of view. Also known as unique risk and asset-specific risk, diversifiable risk.
- It is a micro in nature as it affects only a particular organization. It can be planned, so that necessary actions can be taken by the organization to mitigate (reduce the effect of) the risk.

The types of unsystematic risk are depicted and listed below:

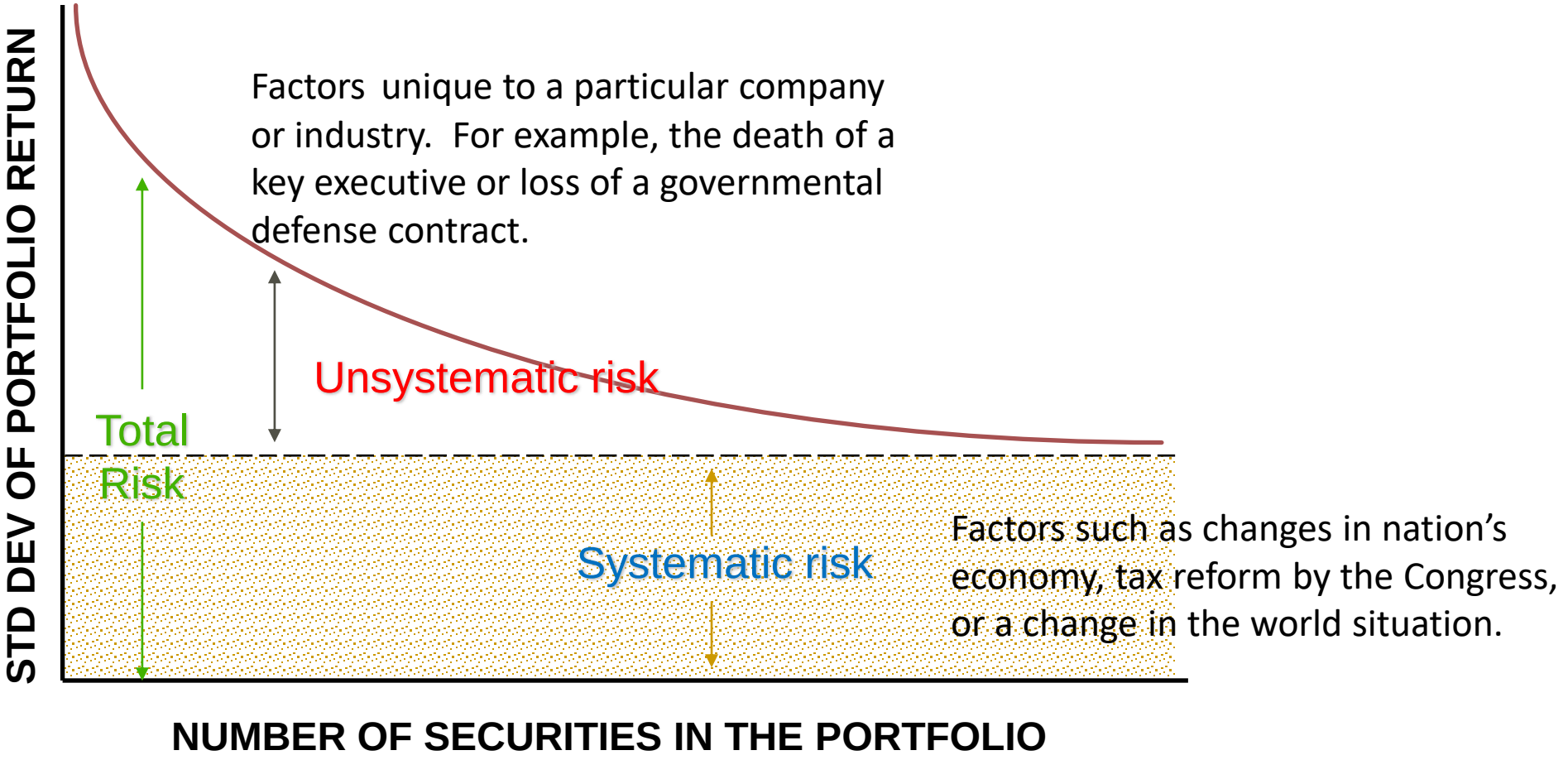
a. Business or liquidity risk,
b. Financial or credit risk and
c. Operational risk.



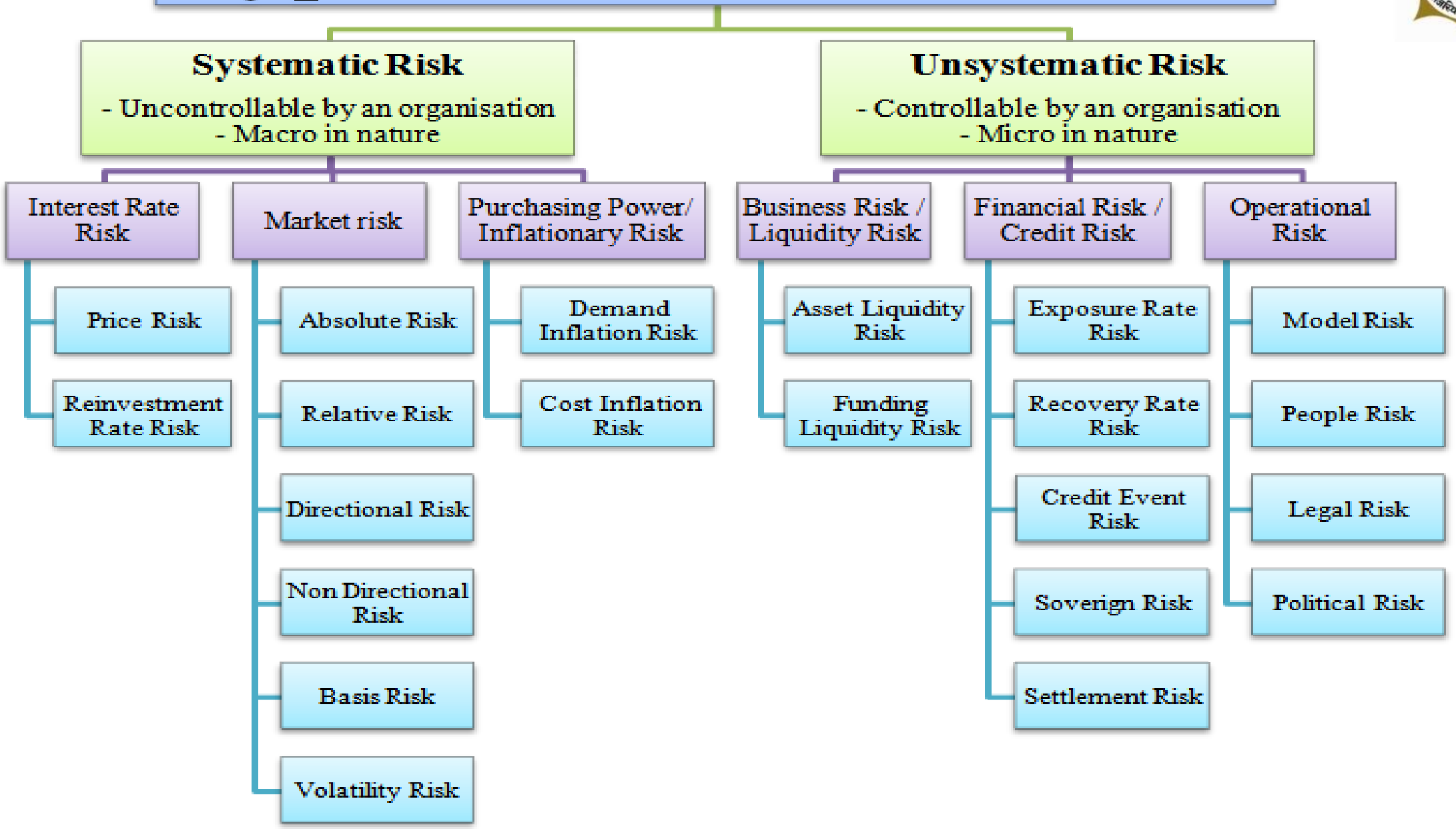
Total Risk

- Total risk = systematic risk + unsystematic risk
- The standard deviation of returns is a measure of total risk
- For well-diversified portfolios, unsystematic risk is very small. Consequently, the total risk for a diversified portfolio is essentially equivalent to the systematic risk

Total Risk = Systematic Risk + Unsystematic Risk



Types of Risk in Finance



Risk – Return Relationship

- A fundamental idea in finance is the relationship between risk and return.
- The greater the amount of risk an investor is willing to take, the greater the potential return.
- Risks can come in various ways and investors need to be compensated for taking on additional risk. For example, a Deposits with Bank is considered one of the safest investments and when compared to an investment in equity shares of a company, provides a lower rate of return.
- A company is much more likely to go bankrupt than the bank. Because the default risk of investing in a equity shares of a company is higher, investors are offered a higher rate of return.

Portfolio Risk and Return

i. Portfolio Return:

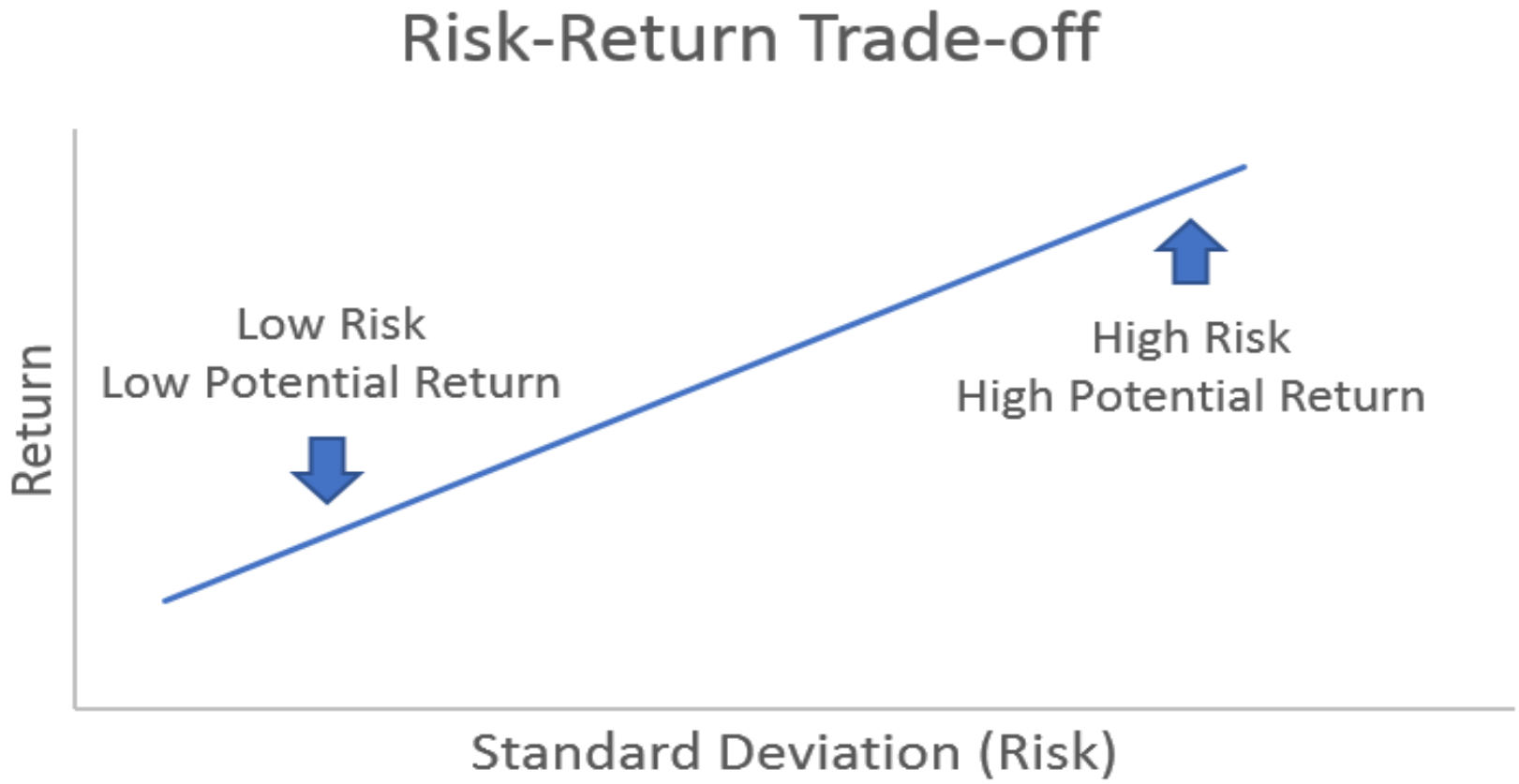
- The expected return of a portfolio represents weighted average of the expected returns on the securities comprising that portfolio with weights being the proportion of total funds invested in each security (the total of weights must be 100).

ii. Portfolio Risk:

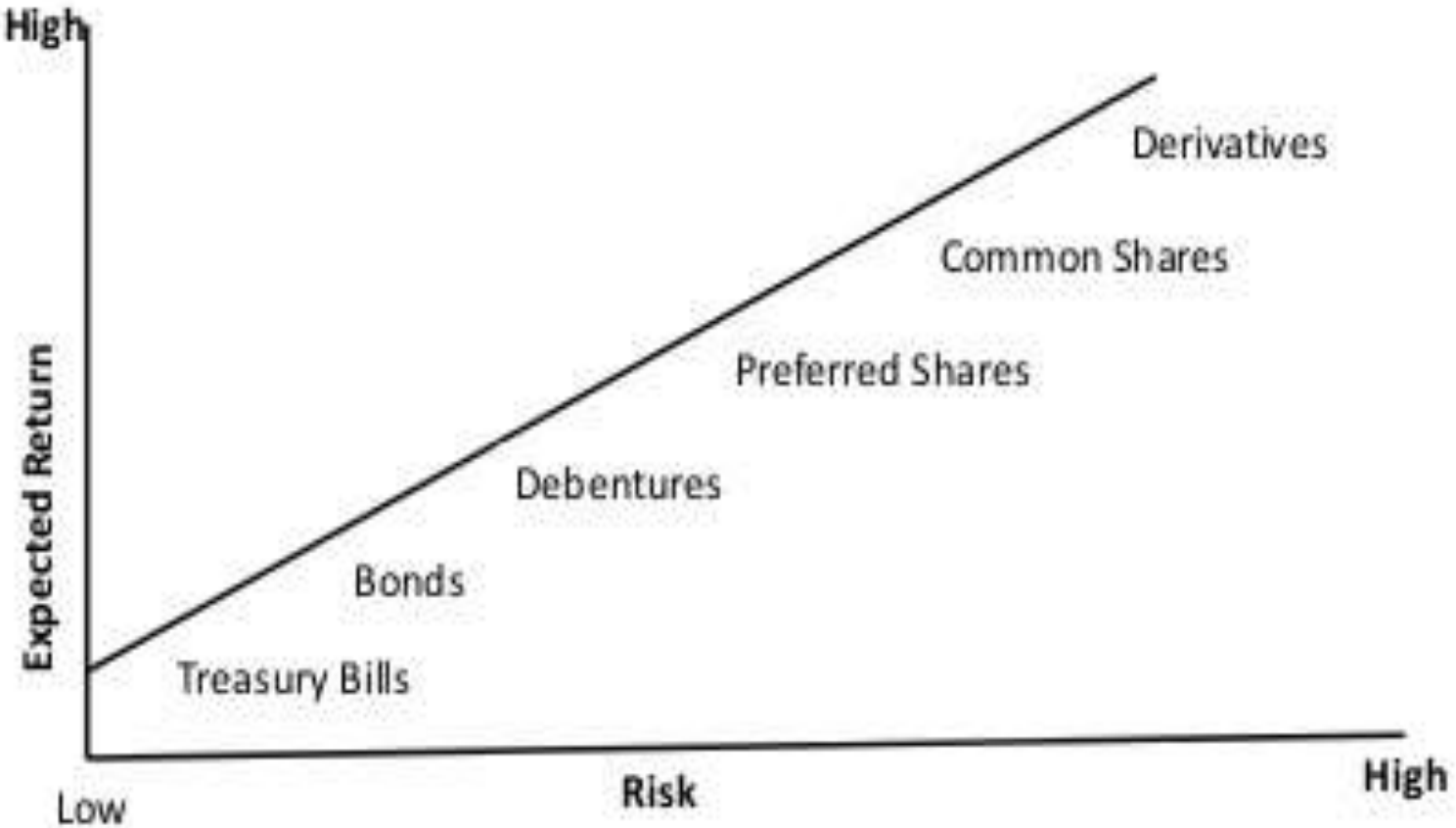
- Unlike the expected return on a portfolio which is simply the weighted average of the expected returns on the individual assets in the portfolio, the portfolio risk, σp is not the simple, weighted average of the standard deviations of the individual assets in the portfolios.

Portfolio Risk and Return

In finance, risk is the probability that actual results will differ from expected results. In the Capital Asset Pricing Model (CAPM), risk is defined as the volatility of returns. The concept of “risk and return” is that riskier assets should have higher expected returns to compensate investors for the higher volatility and increased risk.



Risk Return Relationship



History reveals that the highest rates of return were achieved by securities that had the greatest *variability* or risk as measured by **standard deviation**