



Module 9:

Capital Market Structure and Operations and Basics of Investment

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Table of Contents

Module 9: Capital Market Structure and Operations and Basics of Investment

Importance	3
Learning Objectives	3
Financial Market Structure	4
Capital Market	5
Capital Market Participants.....	8
Investment Decision Criteria	8
What is portfolio?	10
Risk tolerance.....	10
Investment Clients	11
The Portfolio Management Process	12
A-Planning step.....	12
B. Execution Step.....	12
C. Feedback Step	13
Investment Characteristics of Assets	13
Diversification.....	16
Summary	18

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Module 9: Capital Market Structure and Operations and Basics of Investment

Importance

This module illustrates the basic structure and operations of the capital markets, in terms of classifications of financial markets, different types of financial instruments, as well as the main participants and players in the capital markets

Learning Objectives

Upon the completion of this module, you will be able to:

- Identify capital market structure and operations
- Explain investment and portfolio management process
- Explain investment characteristics of assets

Financial Market Structure

In the beginning we want to take a general look on the “Financial system”:

The financial system is a relation between the individuals “ Savers “ and “ commercial institutions “ as in the figure

The commercial institutions needs money in order to start new projects so they get it through on of the below three methods :

1. self investment (direct finance) .

Example :The owner gets to finance the project from his own account.

2. Bank loans (indirect finance) .

Example :The company gets a bank loan

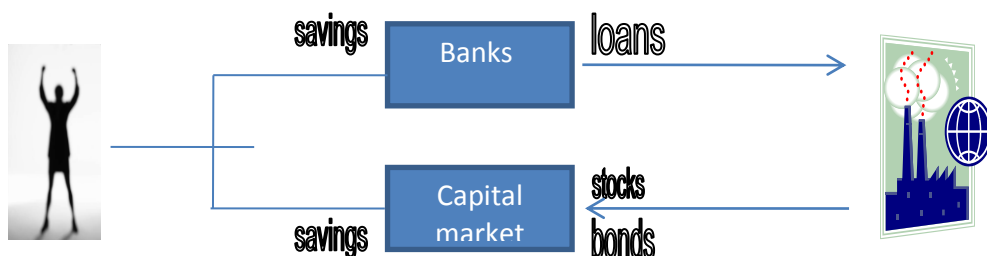
3. Issuing stocks or bonds (direct finance) .

Example :The institutions decides to participate with individuals (stocks) or borrow from them (bonds).Importance

In this section, you provide the motivation to learn (WIIFM or what is in it for me).

On the other hand “savers” who wants to invest their money , they have one of two ways :

1. To deposit their savings at the bank and get interest on them and then the bank will be able to give these money to the institutions as loans ,this way is considered to be indirect finance (As there is a broker between the savers and the institutions) .
2. To investigate their money themselves through buying stocks and bonds that the commercial institutions issue directly from the capital market ,where the commercial institutions and the individuals gather to exchange money and financial tools (stocks and bonds) , and this way is considered as a direct way (As there are no brokers) .



The commercial institutions choose their financial way according to their needs ,but if it choose the third way (issuing stocks or bonds) then it enters a market called the capital market where these financial tools (stocks and bonds) are able to be sold to investors .

Capital Market

Is the market where the buyers and sellers are gathered to create or exchange “ financial instruments “. There are three main kinds of the capital market :

1. Money market : The current financial instruments in the money market are considered to be short term financial instruments (matured in a year or less)

* The Banks are the main institutions which work in this market .

The bank saving accounts ,treasury bills , GDR's belongs to the most important short term financial instruments.

* **Banking saving accounts** : when the saver deposit his saving money in the bank and gets to have its interest “ short term “ .

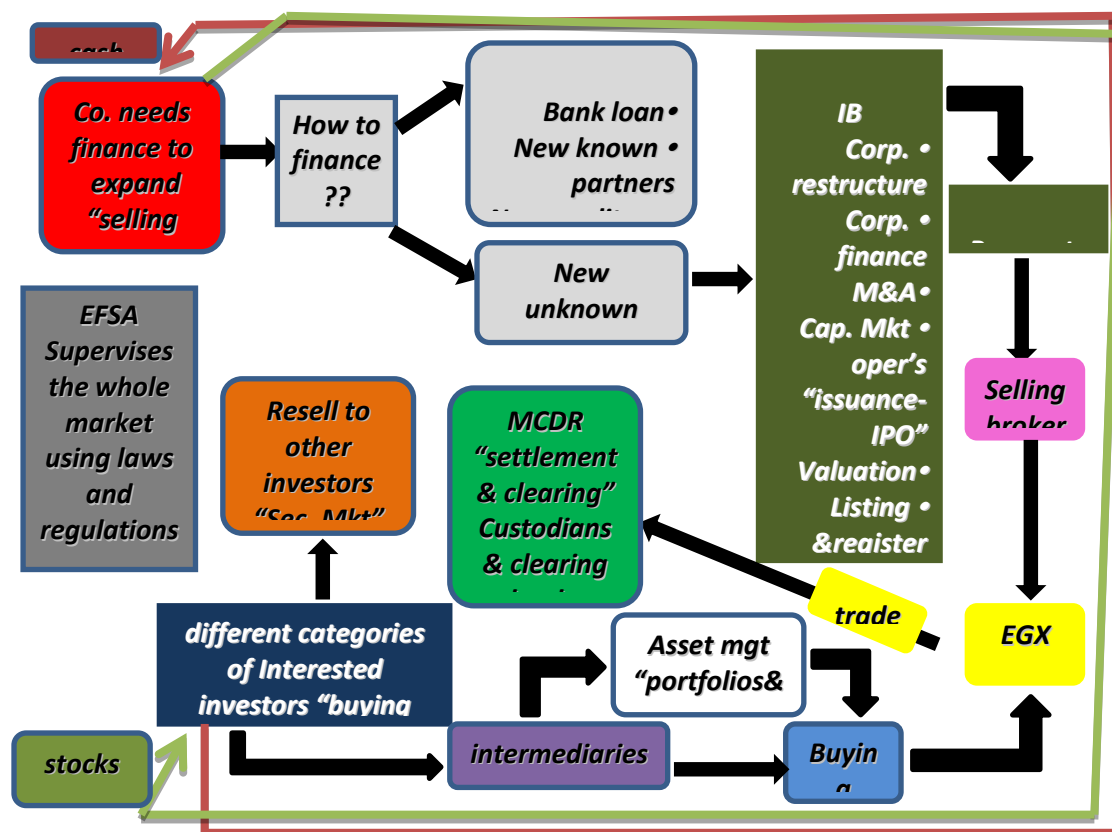
***Treasury bills** : short term debt which the government issue to finance their general projects ,and they are considered as guaranteed investments (zero risk) , where there is almost no risk that the government could not repay .

* **GDR'S** : Non current bank deposits which give interests.

2. Exchange market: The market where selling and buying Currencies takes place and we profit of the price difference.

3.Capital market : The current financial instruments in the capital market are considered as long term investment (matured in more than one year).

Example : stocks , bonds ,and funds .



The investment tools which we sell at the capital market :

1- stocks

2- bonds

3- funds

First : Bonds

The idea of the bonds is that there are some companies do not prefer partnership with individuals (wanting all the profit for themselves) ,so they borrow money from people for a certain period of time and pay it back with interests and this contract is written on a piece of paper called (Bond).

Example : If you bought a bond with the value of L.E 1000 with 10 % fixed interest ,then after the maturity date you receive the bond's book value (L.E 1000) plus the pre-approved interest.

1.Fixed interest bonds :

Bonds issued with fixed interest till the maturity date.

Example : bond with the value of L.E 1000 with 8 % annual interest.

2. Variable interest bonds :

Bonds with a fixed interest for the first ½ year then the interest changes every 6 months in order to keep up with the interest rate in the market to avoid the inflation risk.

3. Zero coupon bonds :

Pays no interest but it's sold less than its book value (with discount) and when the maturity date comes.

Example : Bond with L.E 100 book value ,sold with L.E 70 and on the maturity date after a certain period the whole book value will be returned.

4. Convertible bonds :

Bonds which can be transferred to certain amount of stocks for the same company.

Example: transfer bond into 100 Vodafone stocks this leads to change in the bond price when the stock price changes.

Second: Stocks

The stock is considered as a ownership in the company

Example : If the company wants to issue 10,000 stocks ,if you bought 1000 stocks then you own 10 %of the company ,if you bought 500 stocks more then you own 15 % of the company , through this take part in the company's profit and loss with the same percentage that you own ,that's because you became an owner " stock holder " in the company.

The profit you get to have of being a stock holder is that you are not responsible in person about the company's debt ,in other meaning : you will not lose any amount of money more than what you have been investing (that it does not go near your private savings).

There are two kinds of stocks :

1 – Preferred Stocks

2 – Common Stocks

Preferred stocks	Criteria	Common stocks
Fixed and accumulative	Profit return	Variable and unguaranteed
No voting right	General assembly voting	Can vote
Paid before the common stock holders but after	Liquidation	Get paid after the common stock holders

creditors (bond holders)		
Can be changed to common stocks	Transfer ability	Can not be changed to preferred stocks
Has priority in dividend before the common stocks	Dividend priority	Gets dividends after the preferred stock holders
Has no preference	Subscription priority	Has subscription preference which gives them right to get subscribed with a less price than the issuance price

Third : Funds

The fund is a money container which collects money from a large number of investors in order to be invested by a person with large experience and works hard to get as much profit as he can, everybody buys this fund is considered to be an partly owner with the percentage of his document to the number of the fund's document.

How can the stocks be issued?

Any kind of stock issuance takes place in the “ primary market “ where the capital market divides to two markets :

- 1 - **The primary market** “where the stocks to be sold for the first time to its first owners”
- 2 – **The secondary market** “where the investors swap the stocks between them”

Primary Market

When the company decides to issue stocks ,it has to inform the (CMA) which is the main organizer of the stock market , after the CMA approves ,the company has to declare the subscription in two local newspapers one of them at least in Arabic.

The announcement should state the Bank where the investors head to buy these stocks ,and this is called Initial Public Offering (IPO).

The market where the stocks are issued for the first time called (Primary market) ,the initial public offering in the primary market, where the investors buy these stocks are the stocks first owners.

Secondary Market

- After the investors buy the stocks in the primary market they can be swapped between different investors in the stock market “ Cairo and Alexandria stock exchange “
- So the stocks move from their primary owners to their second owners in a market called “Secondary Market “.
- The stock market represents the secondary market (ex. New York stock exchange).
- The stock price rises in general after it enters the stock market.
- The trading in the secondary market are two kinds:
 - 1 – Organized trading
 - 2 – Over the counter (OTC) trading.

Capital Market Participants

- Issuing Companies "listed companies"
- Investment Banks
- Brokerage Companies
- Asset Management
(portfolio and fund management companies)
- Stock Exchange
- Mutual Funds
- Clearing and settlements house "MCDR"
- Clearing banks
- Custodians / Global Custodians
- Primary Dealers
- Regulators "EFSA"

Investment Decision Criteria

There are six methods for analyzing a project. The two most common and comprehensive are net present value and internal rate of return.

A. Methods and Their Calculation

1. Net Present Value (NPV)

Is the present value of all of the after-tax cash flows associated with a project (including the investment itself), using the project cost of capital as the discount rate.

$$NPV = CF_0 + \frac{CF_1}{(1 + r_{proj})} + \frac{CF_n}{(1 + r_{proj})^n}$$

A project with positive NPV is expected to produce a rate of return greater than the required cost of capital. Such a project should be undertaken because it will increase a shareholder wealth. A project with negative net present value is expected to produce a rate of return less than the cost of capital required to justify it. Such a project should be rejected because it will decrease a shareholder wealth.

2. Internal Rate of Return

Is the discount rate that equates the present value of the cash flow generated from a project to the present value of the cash outlays required for the project.

$$\sum_{t=0}^n \frac{cf_t}{(1 + IRR)^t} = 0$$

A project with internal rate of return greater than the cost of capital required to finance it should be undertaken because it will increase shareholders wealth. A project with an internal rate of return less than the cost of capital required to finance it should not be undertaken because it will decrease shareholder wealth.

NOTICES regarding NPV and IRR

- The NPV method provides the best method for ranking investment projects.
- The NPV is superior method, when NPV and IRR disagree, the project with the highest NPV should be chosen.
- If two projects are independent of each other, then the IRR and NPV will produce the same **decision**.
- The project ranking order for mutually exclusive projects may be different under IRR than under NPV methods when:

- The timing of cash flows differ such that most of the cash flows come in the early years for one project, while most of the cash flows come in the later years for the other project.
- One project is more expensive than another (the sizes of the two investments differ).

3. Payback Period

Payback Period is the expected number of years to recover the original investment in a project.

The payback period is simple to calculate and easy to explain. In addition, it is a good indicator of a project's liquidity -the shorter the payback period/the better the liquidity.

A major disadvantage is that this method does not discount the cash flows by the project's required rate of return. Thus, payback period calculations ignore the time value of money and the project risk also ignores the value of cash flows generated beyond the payback period, this method cannot be used as the sole criterion for evaluating capital projects because it does not measure profitability and does not capture opportunity cost.

4. Discounted Payback Period

Is the number of years it take to cover the cost of an investment from the present value of the cash flows generated by the project, using the project's cost of capital as the discount rate.

An advantage of the discounted payback period is that it does rely on discounted cash flow, while using discounted cash flows help, discounted payback still ignores all cash flows after the payback period.

5. Profitability Index

Is the present value of project's cash flows divided by its initial investment. This is also known as the "benefit-cost ratio", it indicates the value the project returns for each dollar of investment, the disadvantage that it can mislead in ranking the mutually exclusive projects of different sizes because a smaller NPV project could have a larger PI than a larger NPV project. Larger NPV project add more shareholder wealth than smaller NPV projects.

$$PI = 1 + \frac{NPV}{Initial\ Investment}$$

Example:

A project requires a \$100,000 initial investment and is expected to generate the following cash flows in the years after the investment is made.

Year	Cash flow
1	20000
2	40000
3	60000
4	30000
5	10000

Calculate using the above methods? NPV, IRR, PB, DPB, PI

NPV= 23018

IRR= 18.91

PB= 2.67

DPB= 3.18

PI= 1.23

What is portfolio?

A grouping of financial assets such as stocks, bonds and cash equivalents, as well as their mutual, exchange-traded and closed-fund counterparts. Portfolios are held directly by investors and/or managed by financial professionals.

Portfolio management can be considered the endeavor to balance the benefit of investment returns against the negative effects of risk. One way a manager performs this balancing act is by combining individual assets into investment portfolios that take full advantage of diversification

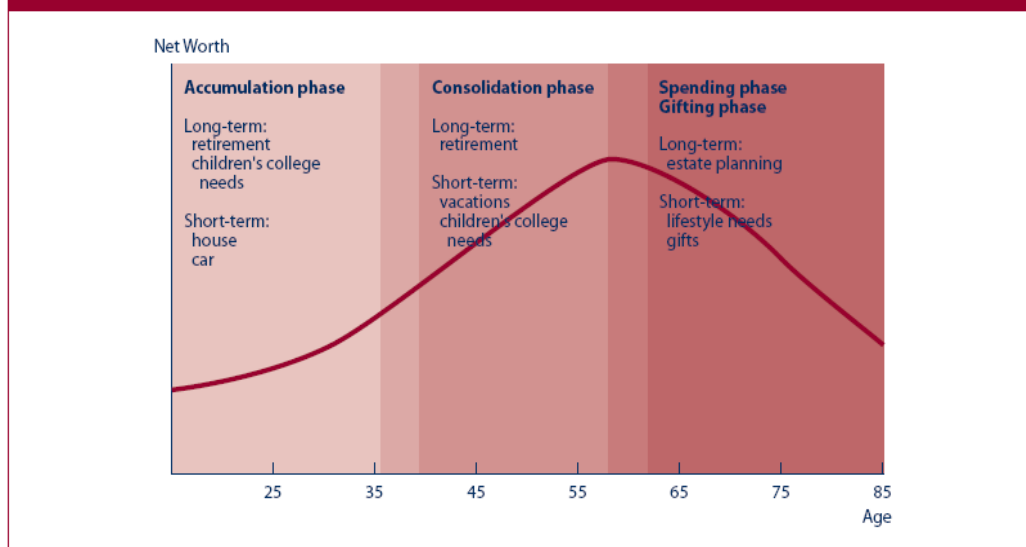
In managing capital, a manager should view asset choices from a portfolio perspective rather than a stand-alone perspective. For example, a high-yield (junk) bond may appear to be very risky viewed in isolation. However, when included in a diversified portfolio of other types of assets, it may even reduce portfolio risk.

Risk tolerance

The degree of uncertainty that an investor can handle in regard to a negative change in the value of his or her portfolio.

An investor's risk tolerance varies according to age, income requirements, financial goals, etc. For example, a 70-year-old retired widow will generally have a lower risk tolerance than a single 30-year-old executive, who generally has a longer time frame to make up for any losses she may incur on her portfolio.

Exhibit 2.1 Rise and Fall of Personal Net Worth over a Lifetime



Investment Clients

The vast majority of the world's capital is professionally managed, so clients can be grouped into individual and institutional types of investors.

A-Individual investors

Managing individual investor portfolio can be quite complicated because each person has multiple, and sometimes conflicting goals.

1-short-term versus long-term goals

Short term goals might include financing things like education, a major purchase, or starting a business while long term goals usually focus on retirement and estate planning

2-Funding retirement

Retirement planning has become the major investing concern for many individual investors, under traditional defined benefit (DB plan), the employer promises a certain level of income to be paid to the employee in retirement. The firm finances that promise by making contributions to a pension fund and managing the fund's assets to meet its future obligations. The employer bears the investment risk of making additional contributions should the pension fund prove inadequate to meet the obligation to employees

In defined contribution (DC plan), the individual's employer deposits fund into a personal account for each employee as part of his or her regular compensation during the employee's working life .the employee may then invest the account balance to finance retirement .the account balance at the time the employee retires represent the amount available in retirement. Under DC plan, once the employer has deposited its contribution, no further liability exists.

B-Institutional investors

In many ways institutional investors are simpler than individuals because their purpose is well defined and more general principles can be applied.

1-Defined Benefit pensions plans

A firm's pension fund uses its assets to finance the future benefits promised to employees when they retire. The plan sponsor (employer) bear the investment horizon of DB pension is generally long term, high risk tolerance and high liquidity needs according to % of retirees.

2- Endowments and foundations

Are legal entities established to finance a non-profit institution, such as a university.

Foundations are similar to endowments but tend to serve as grant-making entities to finance research or other social goals. Both entities usually have perpetual lives that require very long-term investment horizons and high risk tolerance. Their investment objectives usually emphasize maintaining the inflation-adjusted value of their capital, while generating adequate income to serve their respective causes .because spending rules tend to be a relatively small percentage of the asset base, liquidity needs are usually low.

3-Banks

A typical bank takes in deposits and makes loans. The goal is to earn a spread between what it pays depositors and what it charges borrowers. Banking is heavily regulated to ensure that depositors have access to their money and confidence in the banking system. Therefore, banks must invest their excess reserves very conservatively and maintain relatively high liquidity.

4-Insurance companies

The most basic form, an insurance company collects premiums and pays out claims. The goal is to earn a spread by investing premiums before claims are paid .therefore, the nature of the claims is a significant determinate of the investment horizon .insurance is also heavily regulated industry ,so risk tolerance tends to be quite low.

A. Life insurance companies tend to have a long and predictable claims pattern .therefore, their liquidity needs is low.

B. property and casualty insurance companies have shorter and more volatile claims patterns, requiring a short-term investment horizon that emphasizes greater liquidity.

5-Investment companies

Mutual funds pool capital from wide variety of investors and invest those funds according to their stated strategy

6-sovereign wealth funds

The government of some countries has established state-owned investment funds

The Portfolio Management Process

A formal written document called Investment policy statement (IPS) details an investor's objectives and constraints, specifies investment goals and acceptable risk levels .the IPS describes how the assets should be managed and presents a relevant benchmark for evaluating the manager. It should be crafted to meet each client's need individually and updated regularly or whenever the client's objectives and constraints change.

A-Planning step

During the planning step, the manager gathers client information with respect to investment objectives and constraints

1. Investment objectives

-risk tolerance establishes the client's willingness and ability to assume risk.

-the return objective matches an appropriate return expectation, given the client's risk tolerance

2. Constraints

-time horizon defines the period over which the investment goals must be managed.

-regulatory and legal considerations may be an important constraint, especially for institutional investors.

-liquidity need must be established to ensure cash is available when required.

-Taxes are an important consideration because the relevant return metric for most investors is the after tax investment return.

-unique needs and circumstances address any particular concerns relevant to the client

B. Execution Step

Once an IPS has been completed, the portfolio manager must construct a portfolio that complies with the objectives and constraints outlined in the document.

1. Asset Allocation

The choice of which major asset classes (stocks, bonds, real estate, alternative assets) to include in the portfolio may be the most important decision the manager makes. The portfolio manager usually begins with an assessment of risk and return.

Finally, the portfolio manager must determine the mix of asset classes that will optimally meet the investor's risk-return objectives as stated in the IPS.

2. Security Analysis

Once the appropriate mix of the broader asset classes is identified, individual securities within each asset class must be analyzed. Top-down analysis starts with evaluating national economies to identify the most attractive investment environments. Then sectors within those are assessed, followed by industry groups, and so on. The best individual securities are

selected. Bottom-up analysis starts from the individual company securities without much consideration for the broader macroeconomic environment.

3. Portfolio Construction

Armed with the IPS, asset allocation, and security analysis, the portfolio manager actually purchases the securities through a trading desk. The final portfolio must meet the investor's stated objectives without violating the constraints while maintaining the generally accepted standards of diversification.

C. Feedback Step

The portfolio's performance must be carefully monitored to ensure that it is achieving the desired objectives.

Should the client's circumstances or the manager's capital market expectations change, the portfolio should be adjusted to reflect those changes. Furthermore, the actual performance of the securities within the portfolio may cause the asset allocation to diverge from the optimal mix. In this situation, the portfolio should be rebalanced to restore the strategic allocation targets.

Investment Characteristics of Assets

A. Measuring Individual Asset Returns

Investing is the process of using capital to purchase a financial asset (security). That asset is expected to generate a return through some combination of income and capital gain and, ultimately, to return the investor's principal. Income represents periodic cash flows - most commonly dividends or interest-generated by the asset. Capital gain is the appreciation in value of the asset. Return can be measured in a variety of ways.

1. Holding Period Return (HPR)

The holding period return is the percent change in the value of the investor's position considering both income and gains over a specified time interval.

$$HPR = \frac{P_1 + D}{P_0} - 1$$

2. Compounded Return

When returns are generated over a number of holding periods, a compounded return is earned.

$$R_{comp} = [(1 + R_1)(1 + R_2)(1 + R_3) \dots \dots (1 + R_n)] - 1$$

3. Arithmetic Mean Return

When returns are realized over multiple periods,

$$\bar{R}_t = \frac{\sum_{t=1}^T R_{i,t}}{T}$$

Arithmetic mean return implicitly assumes that a constant dollar amount has been invested at the beginning of each period.

4. Geometric Mean Return

A geometric mean return incorporates compounding to aggregate multiple-year returns into a single number. Therefore, this is a better measure of the actual return earned over the periods being averaged than the arithmetic mean return.

$$\overline{R}_g = \sqrt[T]{(1 + R_1)(1 + R_2)(1 + R_3) \dots (1 + R_T)} - 1$$

Geometric mean return assumes that amounts earned in prior periods have been reinvested and earn a return, reflecting a "buy-and-hold" strategy. Therefore, arithmetic mean return will always be slightly greater than geometric mean return for the same series unless all holding period returns are identical.

5. Money-weighted Return

Investors often add or redeem cash over the holding period for a particular asset and these external cash flows impact the ultimate return realized on the investment. The money-weighted return captures the actual realized return by taking these external cash flows into consideration. The money-weighted return is simply the internal rate of return (IRR).

Money-weighted return may not be comparable across individuals even if they invest in the same asset due to differences in the timing and magnitude of cash flows.

B. Measuring Portfolio Returns

1. Nominal Portfolio Return

The return on a portfolio is simply the weighted average of the individual asset returns that constitute the portfolio.

$$R_p = w_1 R_1 + w_2 R_2 + \dots + w_n R_n$$

Note that the sum of the weight must be equal to 1.0 to account for all the individual asset in the portfolio.

2. Gross versus Net Return

Gross return incorporates transaction costs but excludes management and administrative fees. Transaction costs include commissions and other expenses associated with executing trades. Management and administrative fees are charged for managing and administering a portfolio and are typically computed as a percent of the assets under management.

Net return is the actual realized return after management and administrative fees are deducted (from gross return).

3. Pretax versus After-tax Returns

Most returns are reported on a pretax basis because tax liabilities are generally unique to each individual investor. Most tax jurisdictions have their own tax schemes and treat income differently based on the sources of return.

Capital gains are often taxed at a lower rate than ordinary income. Short-term investments are usually held for less than one year and might be taxed at a higher rate than long-term gains. Income may also be treated differently depending on the source. In the U.S., interest is taxed as ordinary income, while dividends are taxed at a lower rate.

Certain types of asset accounts receive preferential treatment in the tax code, like retirement accounts, so asset location should be considered. Finally, certain assets receive preferential tax treatment, like municipal bonds, making asset selection another tool to manage after-tax returns.

4. Real Returns

$$R_N = (1 + \text{Real Risk-Free Rate})(1 + \text{Inflation})(1 + \text{Risk Premium}) - 1$$

When financial planning over long time horizons, such as retirement, investors must be concerned with the effect of inflation on the buying power of their capital. The equation above illustrates the inclusion of an inflation premium in the nominal return. Removing inflation from this equation converts the nominal rate of return into a real rate of return (before inflation). Real rates are useful in comparing returns over long time horizons and between countries with different rates of inflation.

5. Leveraged Returns

Leverage is added when an investor borrows a portion of the purchase price or is only required to post a fraction of the total commitment as margin. Leverage has the effect of magnifying returns, both positive and negative. Therefore, adding leverage automatically increase risk.

C. Measuring Risk

Risk is defined as the volatility of returns.

1. Variance of individual Assets

The volatility of an individual asset's return is measured by its variance (σ^2) based on sampled data.

$$\sigma_i^2 = \frac{\sum_{n=1}^N (R_i - \bar{R}_i)^2}{N - 1}$$

2. Variance of Portfolios

At first glance, one might be tempted to assume that the variance of a portfolio, like its return, is the weighted average of the individual asset variances. However, measures of risk must take into account the interactions between asset returns. One measure of this interaction is covariance. The variance of a two-asset portfolio is calculated as:

$$\sigma_p^2 = w_1^2 \sigma_1^2 + w_2^2 \sigma_2^2 + 2w_1 w_2 COV_{1,2}$$

Correlation (ρ) is a similar but more easily interpreted measurement of the relationship between the returns, taking on a value between -1.0 and +1.0. The variance of a two-asset portfolio is calculated as:

$$\sigma_p^2 = w_1^2 \sigma_1^2 + w_2^2 \sigma_2^2 + 2w_1 w_2 \rho_{1,2} \sigma_1 \sigma_2$$

- Standard Deviation: is the square root of the variance

- **Covariance:** A measure of the degree to which returns on two risky assets move in tandem. A positive covariance means that asset returns move together. A negative covariance means returns move inversely.

The risk of any asset or portfolio, measured as the standard deviation of expected returns, is a combination of systematic (market) and unsystematic (asset-specific) risk. Because standard deviations cannot be meaningfully summed, variance is used as a proxy for risk. The market will only compensate investors for assuming systematic risk. (Priced risk) because it will not be eliminated.

$$\text{Total variance} = \text{Systematic Variance} + \text{Unsystematic Variance}$$

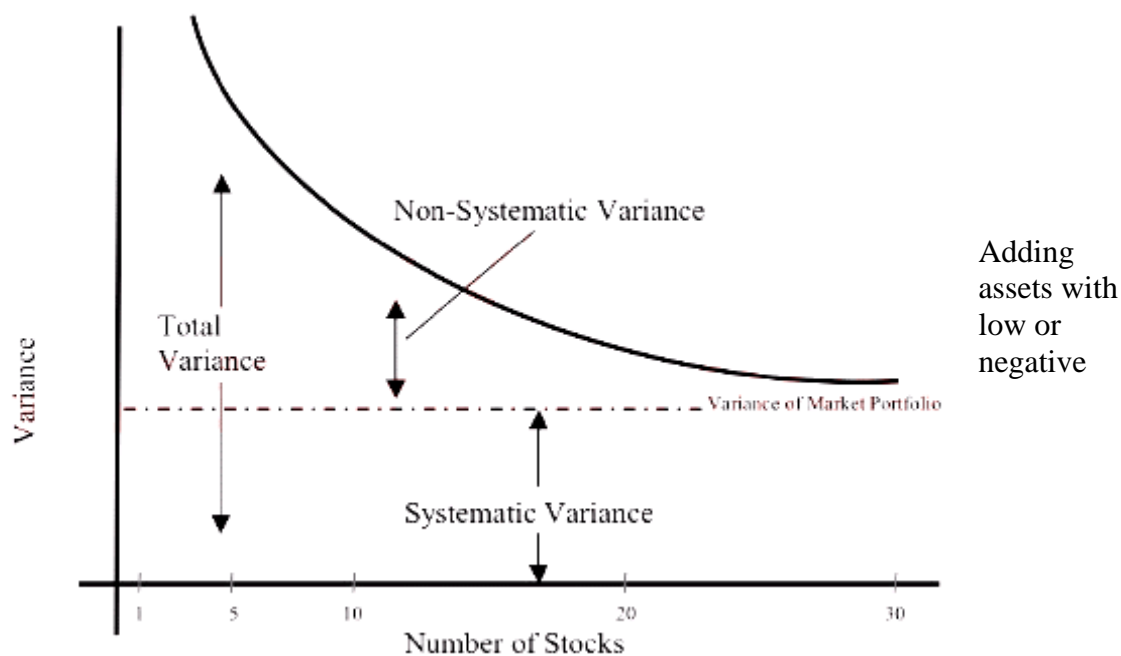
Diversification

By combining assets in portfolios, managers are able to reduce risk without necessarily reducing return. This characteristic of portfolio is called the diversification benefit

The risk return trade off suggest that return should never be considered independently of the risk assumed to achieve it. Diversification seeks to take advantage of low correlations between assets to reduce risk where the volatility of returns is at least partially offset to smooth out the peaks and troughs and hopefully, following a more consistent path.

Diversification, however, has its limitations. For one thing, it is completely dependent upon the correlations between assets. If correlations change in a positive direction (approaching +1), as they often do in times of financial crises, the diversification benefit disappears. In other words, diversification can abandon investors just when they need it the most. While diversification can help to minimize risk, it generally cannot guarantee downside protection.

- 1- Adding assets with less than perfectly positive correlations will reduce a portfolio's risk.
- 2- The lower the correlations, the faster the risk will decline.
- 3- Risk declines at a decreasing rate as more assets are added to the portfolio.
- 4- There is a lower limit to risk which is defined by the average covariance of the investable universe. The diversification benefit as less-than-perfectly-correlated assets are added to the portfolio is illustrated in the following graph



correlations will cause the portfolio's risk to decline but at a decreasing rate. Investor must be conscious of the fact that more assets imply higher administration costs. Therefore, managers must balance the diversification benefit against the cost of managing portfolios with a large number of assets

Summary

In this module, you learned how to:

- Identify capital market structure and operations
- Explain investment and portfolio management process
- Explain investment characteristics of assets