

LAND ECONOMICS & PROPERTY INVESTMENTS

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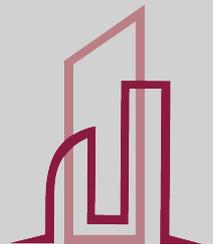


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1.0 INTRODUCTION

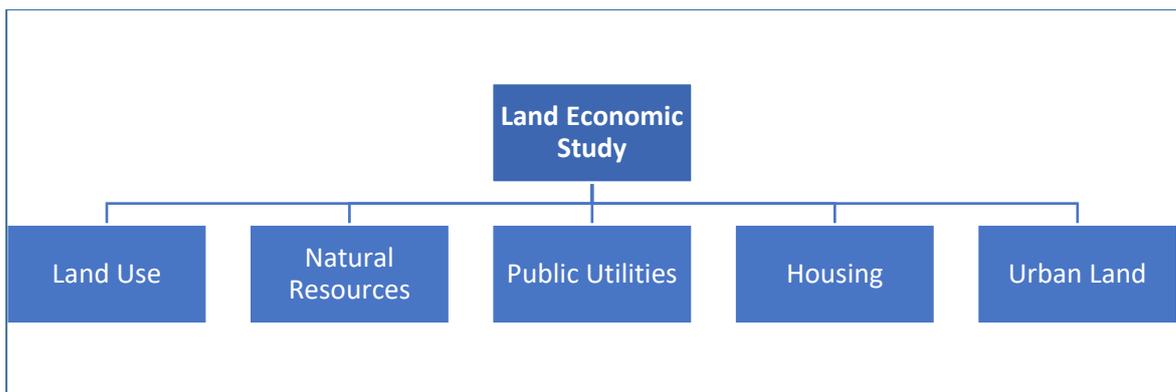
Land Economy can be defined as follows:

- The study of the principles and policies of the use of land and land resources whether by political direction or by proprietary enterprise under legal restrictions.
- It is derived from a study of economics and law but does not lie wholly within the boundaries of either of these disciplines as academically understood.
- It is a logical academic advance from estate management; sufficient of a departure in content and principles to require a new title but not so far removed that it must be thought of as the introduction of an entirely new subject.

(University of Cambridge)

IN SIMPLE TERM:

Land economy means the study of the principles and policies of the use of the land that is subjected to the political will or organization which is controlled by the law.



Land economics involve decisions made by individuals on land and building matters. Thus society will normally be institutionalised to adjust those decisions made by them to suit society requirement.

2.0 REVIEW OF LAND ECONOMICS CONCEPT

2.1 Agglomeration Economy

Agglomeration may be defined as the concentration of activities for economic purposes. Most land economic studies will have two types of approaches, either geographical approaches or economic approaches. It all depends upon the target readers. Readers that require planning or geographical aspects will find books or studies that have inclination or issues pertaining to either one of the approaches.

Urbanisation must have both similar and dissimilar activities. If a settlement engaged in similar activities, it will not suffice or meet the urbanisation definition. Hence, in an agglomeration economy the types of activities dictate whether it is a settlement or a township. The 1953 AL-MALAZ project or the 2011 ESKAN program which is a residential-based development does not by itself qualify as a township.

In 2011, King Abdullah announced a plan to build 500,000 homes in Saudi Arabia over several years. Some \$67 billions of state funds were earmarked for the plan. The activities involved residential-based process. The recent move by ESKAN to developed townships with multiple land uses within the settlement will undoubtedly qualify ESKAN settlement as an urban township.

2.1.1 The Pull Factors

The formation of township hinges upon both localisation and urbanisation process. Pull factors are normally factors that entice people or businesses to migrate or relocate their locations. The pull factors may agglomerate single types of activities such large land scheme for example ESKAN housing schemes. Figure 2.1 demonstrates how the pull factors affect urbanisation.

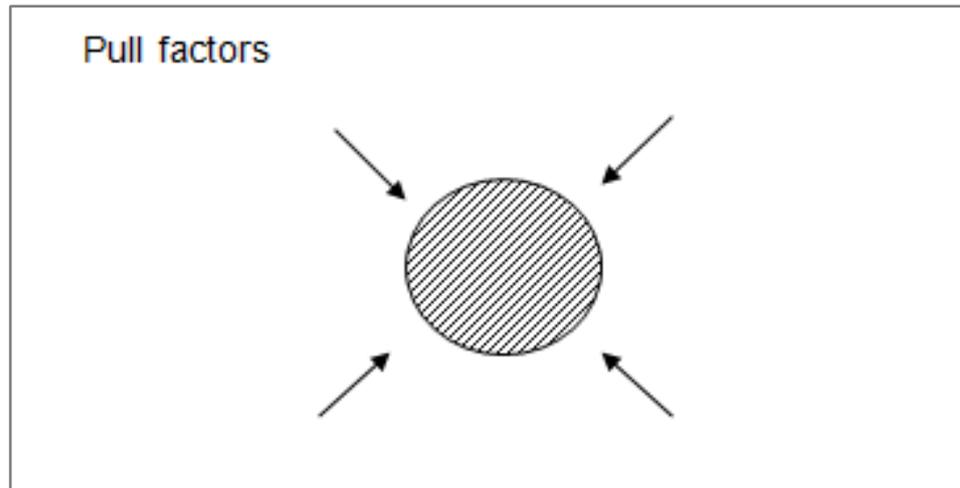


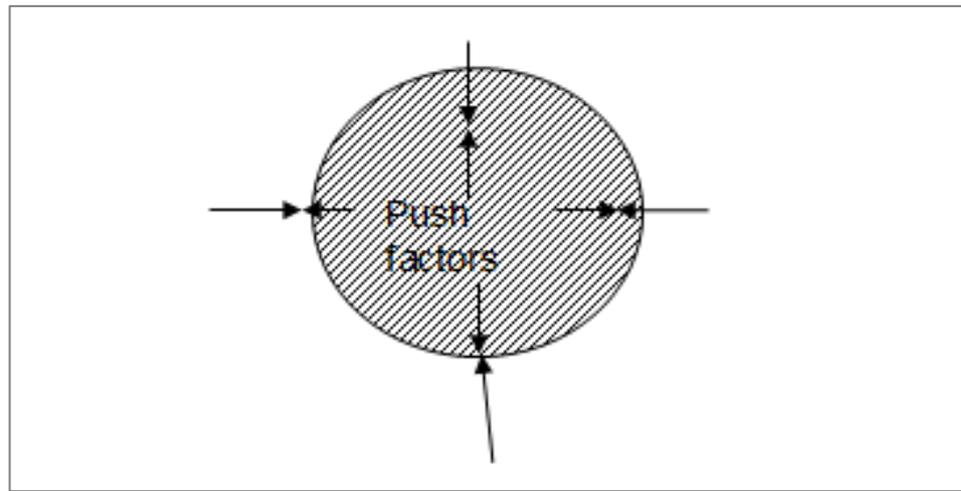
Figure 2.1: Agglomeration/ localisation process

An example of the pull factor is the Structure Plan that has areas reserved for certain purposes. Most zoning in towns involved residential, industrial, commercial, recreational or mixed uses. This has direct impact in term of land values or market price of lands. As land become scarce, the value will also go up. The pull factors do not necessarily involve planning or economic factors but also in case of people, social factors also play an important part in human settlement. As land value is created as a result of supply and demand factors, pull factors such as zoning, market and potential price of land and other social factors may entice both residential and other activities to agglomerate within an area. The plethora of complementary and conflicting activities causes various pull factors to band together. This togetherness of activities will either improve or reduce prices of a location.

2.1.2 The Push Factors

The push factors will normally equate the pull factors when it has become unbearable for people to stay within a conurbation. The natural urge to move elsewhere is due to the ability to make choices. Choices are due to improved purchasing power as people become self-sustaining in life. Commercial and industrial expansion

force firms to relocate to increase productivity or paying less tax. Some development like hypermarket requires large tracts of land for customers parking. This can be seen in hypermarket for example CARREFOUR KSA, FAWAZ ALHOKAIR. These hypermarkets are highly specialised retailers. The success of large superstores, have driven development to be located in out of towns locations. Sites that have smaller land area accommodate smaller shopping centres.



RECAP:

Agglomeration - Define as the concentration of activities for economic purposes.

The Pull Factor – Pull factors are normally factors that entice people or businesses to migrate or relocate their locations. Examples: zoning, market and potential price of land and other social factors

The Push Factor – The push factors will normally equate the pull factors when it has become unbearable for people to stay within a conurbation. The natural urge to move elsewhere is due to the ability to make choices. Choices are due to improved purchasing power as people become self-sustaining in life.

2.1.3 Conditions for Agglomeration

Certain conditions are needed for agglomeration to thrive. Surprising most of the conditions are social, technology and finance based. This means that apart from economic dominant of urbanisation there are also other non-economic factors that depict the formation of township.

i. Potential Size of the Local Market

An area to strive and thrive must have a certain threshold capable of supporting the populace. It is in this respect an urban containment should contain enough population with good purchasing power. There are some town with large population but with poor purchasing power. This does not contribute to urban expansion but will eventually lead to inner city problems for example slums, poverty and housing deprivation.

Basically the larger the town the higher is the externalities. Externalities or better known as impact may be classified into two extreme types; positive externalities and negative externalities. Marginal externality may not been encountered in any literatures pertaining to land economics. If research carried out to investigate these phenomena, an inductive approach will be more suitable as positive and negative theoretical assumption has been widely investigated. Economics research will find that quantitative approaches will be more suitable to carry out this theme. Externalities will be dealt separately in subsequent notes.

Another bone of contention of market size is economies of scale.

Basically firms operating in a large scale grow backward to control raw materials and forward to control outlets. Honed by oligopolistic competition these firms capitalised first mover advantage to capture markets. It is in this respect that economies of scale guided by strategic management, firms acquire cost advantages over competitors by controlling a segmented market. However smaller firms may find that economies of scale may not be to their advantage due to market thresholds.

Market threshold depends upon market size and purchasing power. Figure 2.3 depicts that cost decline as production increases but will steadily remain at a certain costs but will never realistically dive to zero. However after a certain point, price start to increase as complexities in management began to build up. This is due to acquisition of more fixed assets such as land and machinery. The situation warrants certain firms to remain at an optimal size. This cost control strategy sometimes is difficult to manage as cost will undoubtedly increase. Similarly the issue of inflation, resources becomes more scarce and more recently in Malaysia the demand for minimum wages among workers by trade unions.

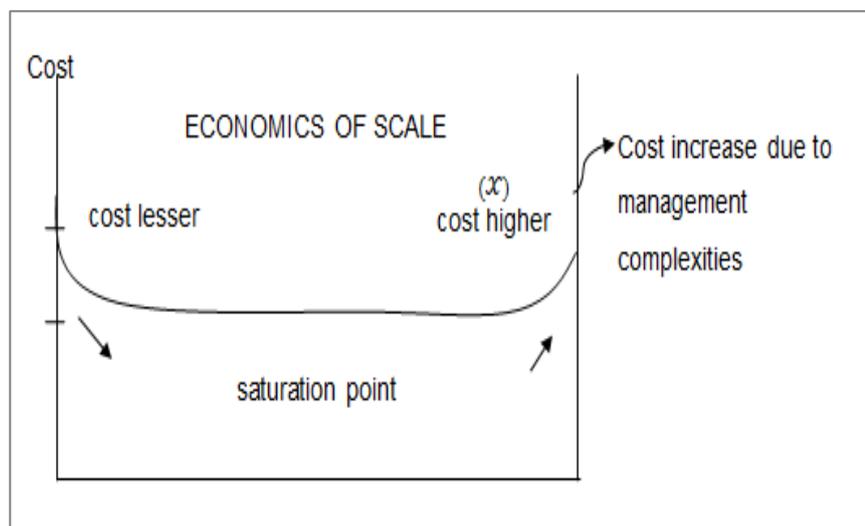


Figure 2.3: Economics of scale

ii. **Geographical Concentration of People**

Under King Salman, further change is in the works. In his first major speech on domestic and foreign policies, he called for new programmes to promote national unity and economic development. He indicated the need to provide more job opportunities in both the public and private sectors and for more medium and small enterprises. He did not mention expatriate workers. It is obvious that the paramount need is to guarantee jobs for Saudi graduates. Roughly 45 per cent of university students are studying subjects that do not have a technical or vocational focus to prepare them for the job market.

The Ministry of Education's Dorooob programme aims to match education with the labour market through courses such as interpersonal training, English language skills and computer skills. Training courses for specific jobs, such as to be a retail sales assistant, hotel front desk clerk and IT support assistant, are also available. Both Musaned and Dorooob are meant to provide the bridge between a Saudi Arabia reliant on expatriate workers and one with a Saudi workforce, but the demands of Saudisation have made for some confusing signals.

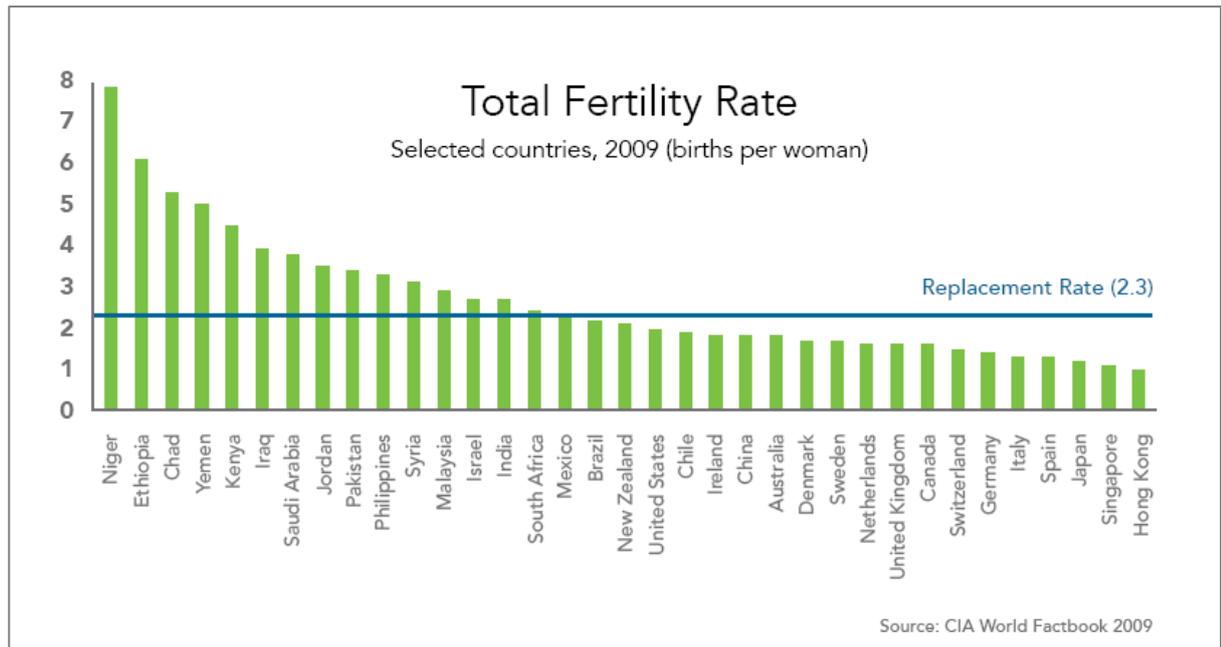
Some analysts, both Saudi and foreign, are saying the kingdom is trying to match other gulf states that are reassessing how long expatriates can work. However loss of expatriate workers may hurt Saudi economy in the long run.

iii. **Availability of Skilled Worker**

A new generation of independent, transient and globalized workers in the burgeoning knowledge economy is creating new rules around hiring and engagement. Human resource has undergone evolution from the model prevail from the post second world war.

This model was forged in the 1940s where the influx of military officers which have their roots and expertise in supply chain and logistics. The business transformed in the 1960's and 1970's using this paradigm is no longer sufficient because employee relation, performance appraisal, training and recruitment has move beyond transactional task. There were interest using IT and could liberate the Human resource people from routine task. The right fit with job description dominate this era undoubtedly moving professional towards higher value tasks.

The next wave of activity is about talent. Those who can bring education and occupational skill to an organization can make an immediate and lasting impact. The issue of shortage of labour points to shortage of qualified people. Figure 2.4 demonstrates world fertility rate that lead to a paradox where industrialised country are facing shortage of talent due to their low fertility rate. This cannot be matched by developed countries as the fast growing populations do not have educational infra structure to develop a level of skim labour. This paradox has led to limited global pool of skilled labour. Again, this is not a shortage of people but a shortage of qualified people.



iv. Managerial and Entrepreneurial Talent

The notion of operative entrepreneurship definition is that value laden individual that has the capability and ability to turn strategic resources into a profitable entity. The inclusion of developing an individual that possess necessary characteristic of entrepreneurship was incorporated to build a resilient, long term business relationship. Some are opportunist, selling their businesses once it reaches maturity.

Some developed trend that 'ends justify the means' producing low quality products at the expense of consumers. Despite the country's stiff appearance, the Saudi Arabian General Investment Authority has managed to turn the country into an ideal destination for business and entrepreneurship thanks to simplified measures and many associated benefits such as the lowest average tariff rate in

the Middle East and North Africa (MENA). Moreover, local authorities have reduced the port handling fee by 50% in 2008 so as to further encourage entrepreneurship. Note that Saudi Arabia has been listed as the MENA region's best country to do business by the World Bank. In fact, the country has remained faithful to private companies' liberal political traditions. In other words, foreign investment laws allow foreigners to hold 100% ownership of their projects, even when it comes to real estate.

Finally regarding competitiveness, Saudi Arabia's fiscal environment includes low taxes and numerous incentives. For years, many foreign investors have benefited from its financial freedom. In addition, the stability of the Saudi currency, indexed to the US dollar, gives no restriction whatsoever in terms of foreign exchange or profit repatriation for foreigners.

v. Pool of Skilled Workers

Human capital in Saudi Arabia is built on firm foundations: a strong schools system, based on small class sizes averaging 11 students and the world's advanced ranking in government spending on education. Saudi Arabia has an extensive network of further education and higher education institutions, including more than 80 vocational colleges, 25 public universities, eight private universities and 20 private colleges. Vocational training is being greatly expanded: in 2009, some 94,000 students graduated from 80 vocational and technical colleges; by end of this year 2015 the annual number of vocational-course diploma graduates is expected to reach 450,000.

Over half of Saudi Arabia's 9.7 million-plus employees are expatriates, including highly skilled professionals and low-cost workers. For decades' non-nationals have been welcomed in Saudi Arabia's open, dynamic economy and now make up 28%-33% of Saudi Arabia's population. Human capital in Saudi Arabia is built on firm foundations: a strong schools system, based on small class sizes averaging 11 students, and the world's advanced ranking in government spending on education.

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vi. Greater incentive for innovation

In its quest to diversify its economy, attract foreign investment and tackle unemployment, the Kingdom of Saudi Arabia (KSA) embarked on developing four new 'economic cities' under the principles of smart city planning. The new cities are overseen by the Saudi Arabian General Investment Authority (SAGIA), a governmental agency

established in 2000 to act as a gateway to investment in the KSA.

Knowledge Economic City (KEC) is another one of the four intelligent cities to be developed in the KSA. KEC is located just outside the holy city of Medina, serving as an alternative Central Business District for the existing city. It spans an area of 4.8 square kilometres, expected to host a population of 200,000 people. The venture's vision is to 'attract Muslims from around the world', focusing on knowledge-based industries, tourism and services. The development cost is approximately \$7 billion. The land for the development was provided by the King Abdullah Foundation. The project is being developed by Knowledge Economic City Developers, a consortium of companies established for this purpose.

On the governmental side, the Economic Cities Authority is the prime development facilitator; it acts as the one-stop Government servicing centre for the development of KEC. In matters of smart city infrastructure, CISCO will undertake the design and implementation of the network infrastructure and connected city services; the city will be wired with high-speed broadband infrastructure, while all urban operations will be managed through Integrated Operations' Centres, meant to act as the 'brain of the city'.

The master plan includes a complex for technology and knowledge-based economy, technological and administrative colleges, an Islamic Civilization Studies Centre, a Campus for medical studies, biological sciences and health services, a business centre, a commercial plaza and residential areas. The project started in 2006 and was initially expected to be complete in 2020 (now extended to 2025). Some parts are currently under development.

Agglomeration Factors



Exercise 1

1. Define the followings:
 - a. Land economy
 - b. Agglomeration economy
 - c. The pull factor
 - d. The push factor
2. Name five (5) land economy areas of study.
3. List down the factors that contributes to agglomeration.

3.0 REVIEW OF MICROECONOMIC ANALYSIS

3.1 Consumer Surplus

This is the difference between what the consumer pays and what he would have been willing to pay. For example: If you would be willing to pay SAR500,000 for a condominium, but you can buy for SAR400,000; in this case your consumer surplus is SAR100,000.

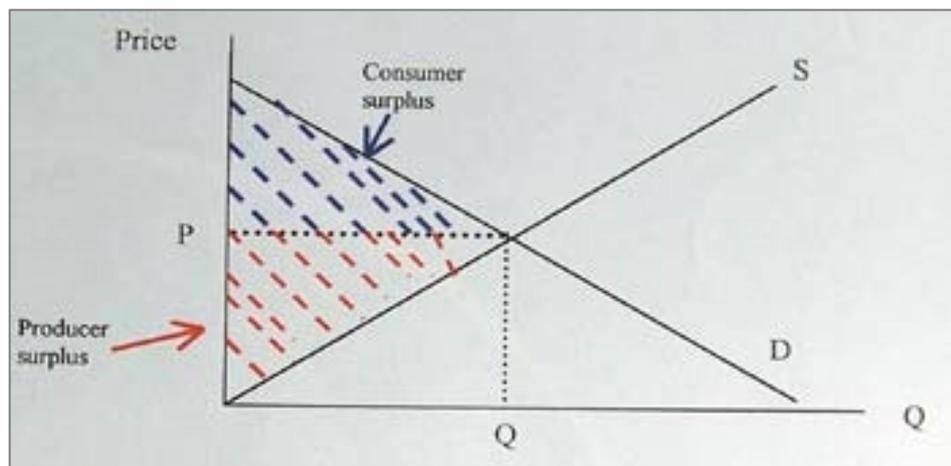


Figure 3.1: Diagram of consumer surplus

The demand curve shows the maximum price that a consumer would have paid. Consumer surplus is the area between the demand curve and the market price. If the demand curve is inelastic, consumer surplus is likely to be greater

- Monopolies are able to reduce consumer surplus by setting higher prices
- Price Discrimination is an attempt to extract consumer surplus by setting.

3.2 Economic Rent and Transfer Earning

The whole idea between **economic rent and producer surplus is almost identical**. Economic rent is measured in term of input while producer surplus is measured in term of output. They are similar in concepts based on the idea that someone may gain something beyond what would accept otherwise. With economic rent it is the excess attributed to factor of

production, with producer surplus, it goes to the company in terms of earnings from selling at a higher market price that the company was willing to charge. Transfer earning maybe define as the minimum payment needed to prevent a factor of production (land) from moving to another uses.

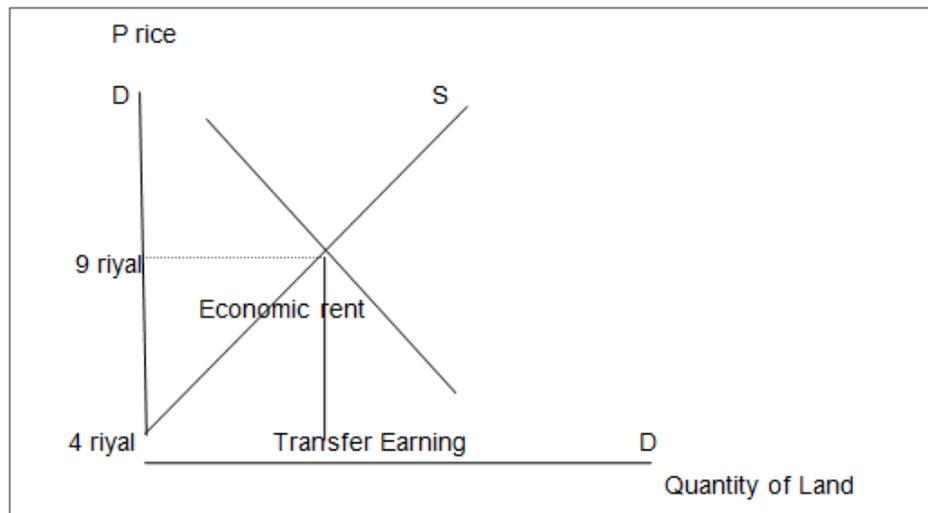


Figure 3.2: Depiction of economic rent and transfer earning
 $\text{SAR } 9 \text{ (commercial rent)} - \text{SAR } 4 \text{ riyal (transfer earning)} = \text{SAR } 5 \text{ riyal}$
 (economic rent or consumer surplus/opportunity cost)

Figure 3.2 depicts the notion of economic rent and transfer earning. Economic rent refers to income earned from a factor of production in excess of their transfer earning. Ricardo's economic rent is basically the different between production cost and market price. A more modern view of economic rent is through the understanding of opportunity cost. The change of use for land is a typical example of this concept. A land will need SAR4 to keep in its existing use, thus in order to change to best next use, the land will need SAR9. Thus the payment beyond that opportunity cost or transfer earning is economic rent.

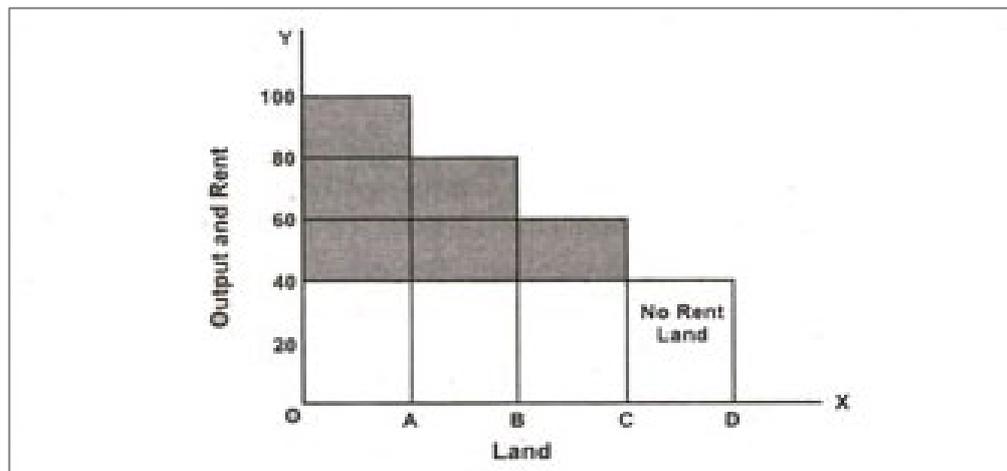
3.3 Ricardo Theory of Land Rent (LAND VALUE CONCEPT)

The Ricardian Theory may be illustrated through Table 3.1 below:

Table 3.1: Production and rent

Grades of Land	Total Product (metric tonne)	Rent TP – TP of D (metric tonne)
A	100	100 – 40 = 60
B	80	80 – 40 = 40
C	60	60 – 40 = 20
D	40	No rent

The table shows that the rent of A, B and C grades of land are 60, 40, and 20 metric ton respectively. D is the marginal land. The theory can be illustrated with the figure below:



In Figure 3.3, the four grades of land of equal area A, B, C and D has been shown along the OX axis. The yield of these lands has been shown along the OY axis. The corresponding rectangles of A, B, C and D show their respective yields, that is 100, 80, 60 and 40 metric tons of wheat. The shaded area of each rectangle shows their rent. Since D is the marginal land it has no rent. The marginal land thus plays the decisive role in the determination of rent.

3.4 Law of Diminishing Marginal Utility or Marginal Returns

The law of diminishing utility was first coined by A.R.J Turgot in the 18th century and later improved by Thomas Maltus, Edward West, Robert Torren and David Ricardo which later developed the idea. It is the fixity of the supply of land which sets the law of diminishing return in motion. In short period some factors are fixed and given. When other variable factors are combined with this factor in increasing proportions, this fixed factor is distribute on the units of variable factors. After an ideal combination the proportion of variable factors to fixed factors become high. That is why diminishing return occurs.

The real intention of the law of diminishing marginal utility is to relate the balance between factor of production i.e. capital, land, and labour. If the combination of this factor of production exceeded a certain level, the output may not match the inputs being assembled. Thus a balance is needed to achieve the highest and best use of a particular piece of land. The graphs in Figure 3.4 illustrated below explain further:

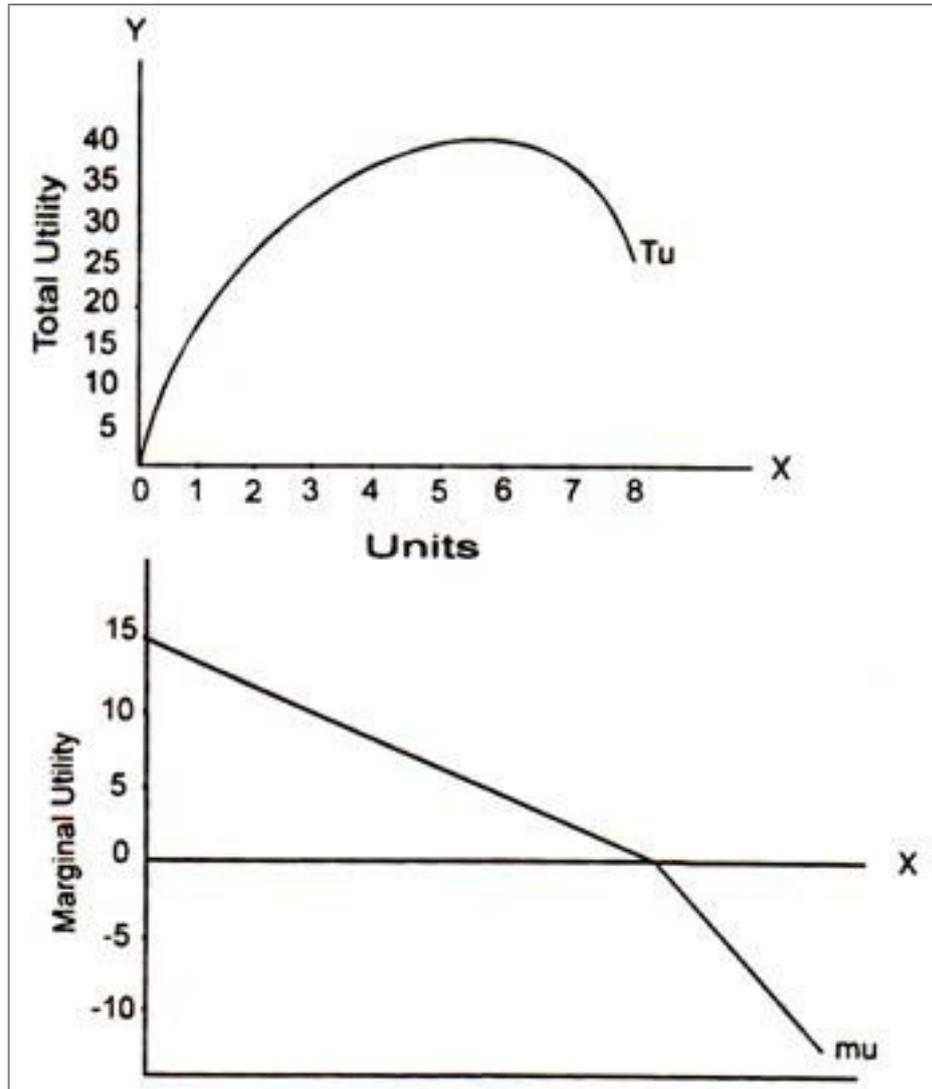


Figure 3.4: Diminishing marginal utility

When more units are taken, the utility or satisfaction starts to fall. As more units are added, the utility may reduce to negative and the graph appeared to be kinked at this point as shown in the above graph. The significance of the diminishing marginal utility of a good for the theory of demand is that the quantity demanded of a good rise as the price falls and vice versa. Thus, it is because of the diminishing marginal utility that the demand curve slopes downward.

Exercise 2

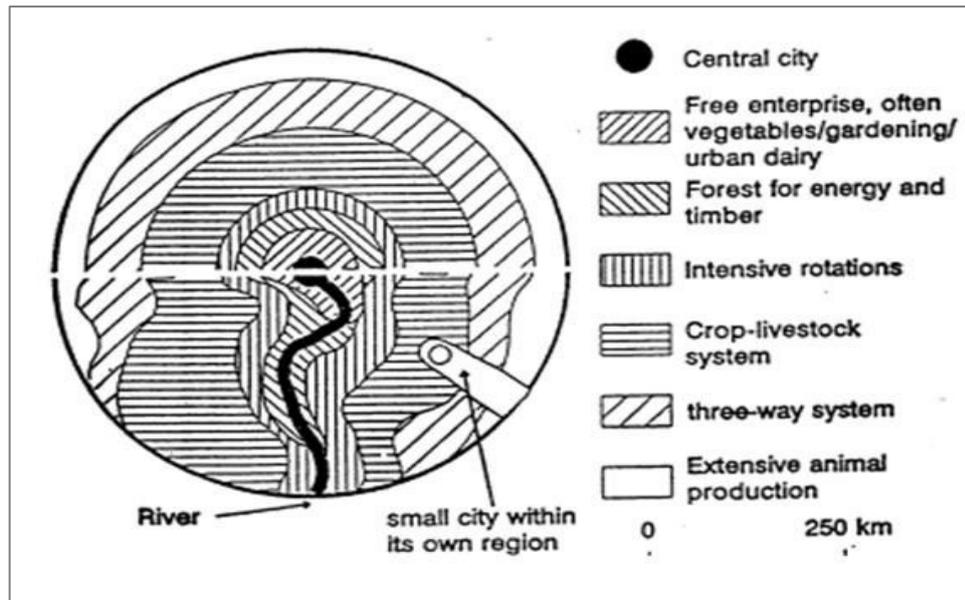
1. Define the followings:
 - a. Consumer surplus
 - b. Economic rent
 - c. Transfer of earning
 - d. Law of diminishing marginal utility

4.0 REVIEW OF URBAN LAND USE THEORIES

Models are used to depict towns and cities and show a general idea of the shape of the city. During the 20th century a number of models have been developed to demonstrate how township grew. The idea of a model town was first coined by Heinrich Von Thunen (1783-1850) in 1826.

4.1 Von Thunen Agricultural Model

Von Thunen model (Figure 4.1) was developed before the industrial revolution. The following assumptions stipulated that it is a self-sufficient township which has no external influences. Furthermore, land is of equal fertility and farmers sent their produce using oxcarts since there are no roads. The concentrations of perishable produce are located in the middle of town where there is a concentration of people. Logically vegetable and dairy produce are located in the middle of the town, because there is no form of refrigeration or cold storage during the late nineteenth century. The other forms of land use in Von Thunen's model signify the need of fuel for cooking and heating where forest circulates the township. Other forms of land use demonstrate the planting of rotational grains harvest, while the periphery focused on ranching and animal husbandry. The central city was well connected to a river as this is the main transportation for people and ferrying goods. Von Thunen's agricultural model set the pace for subsequent modern land use models.



4.2 Concentric Model

Burgess (1925) after observing American cities obtained empirical evidence by presenting a representation of a descriptive urban land use. This model links income (socio-economic) of the population and distance. The model assumes that people will stay nearer to town centres to gain. According to Burgess, the expansion and reconversion of land uses which a tendency to force outward in a set of concentric circles from CBD to the suburbs. In Zone 1, the CBD which is the most accessible is where all the transportation utilities converged.

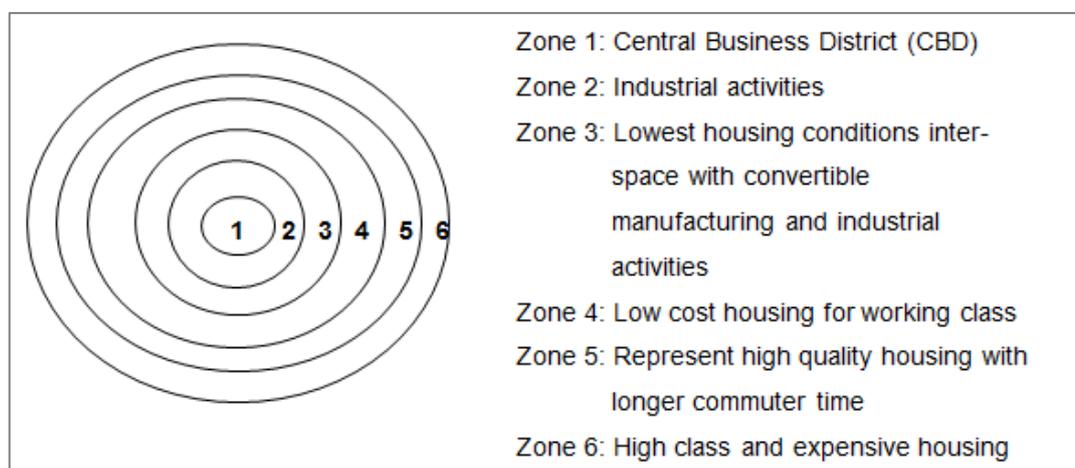


Figure 4.2: Concentric model

This focal point of the city accommodates most of the cities employment and administrative centres. Zone 2 adjacent to CBD, lies the industrial sites. This portion of the cities takes advantage of port-sites and railway infrastructures for example dry ports to transport both perishable and raw materials in bulk. Zone 3 lies the poorest segment of the township. During the 1930's workers unable to pay high commuting costs choose to stay nearer to their manufacturing workplace. However, history has shown that these areas are predominantly occupied by poor immigrant workers. Zone 4 lies the second generation of immigrant workers who successfully move away from the previous zones. This zone is also occupied by working class people with lost cost housing. Those who can afford to pay the higher commuting cost occupied Zone 5 which represents higher quality housing. Zone 6 is represented by high class and expensive housing. This caters for the rapid diffusion of automobiles in the 1930s.

This model was criticised on the basis that township consisted of mix development and contrasted from Burgess uniform concentric development. In some European cities the CBD is the most important activities compared to Burgess Model. However, this model demonstrated that towns or cities are made up of multiple land use. The main point is that similar uses are clustered and compatible. The significance of Burgess Representation is that it almost replicates some major township patterns in Mecca. The radial-concentric plan considers the Great Mosque as point of convergence. Radials are the path privileged by pilgrims to reach the mosque. High quality housing is found nested in the suburbs, while low cost flats or apartment are located within the CBD boundaries.

4.3 Radial Model

Radial model is an adaptation of concentric model, the numbered ring-linear zone are similar to Burgess Model, the main different is the topography of the sites which do not allow for spatial distribution of land

uses. Development is located along major routes. The linear pattern of development takes advantage of accessibility, which is either egress or ingress. Some linear pattern take place initial either at the ingress or egress of routes. This will depends upon the ease of accessibility, highways that are deprived of entry and exit has most of the development at entry and exit points (Figure 4.3).

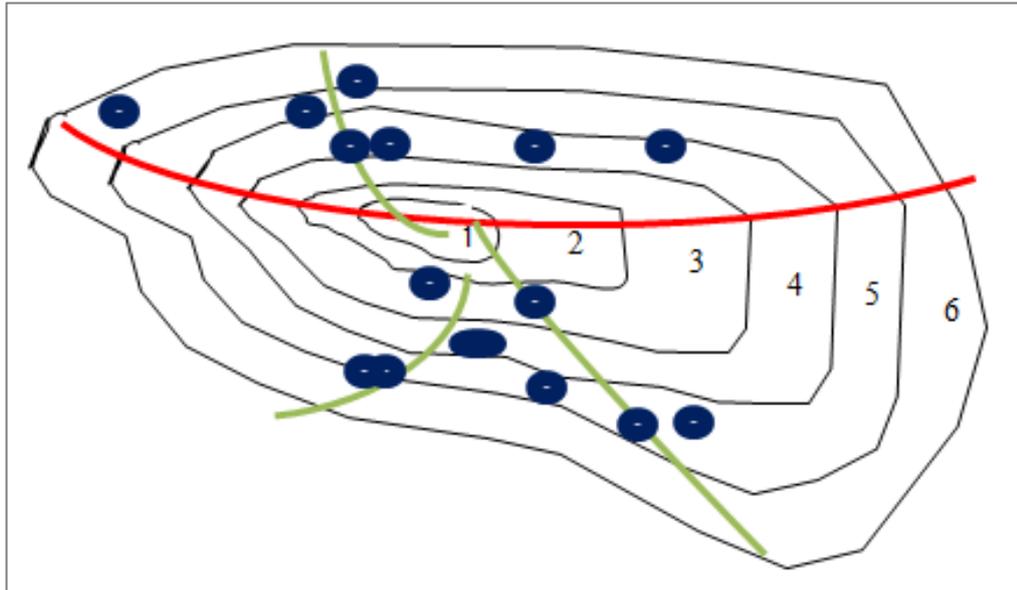


Figure 4.3: Linear Model/Radial Model/Axial

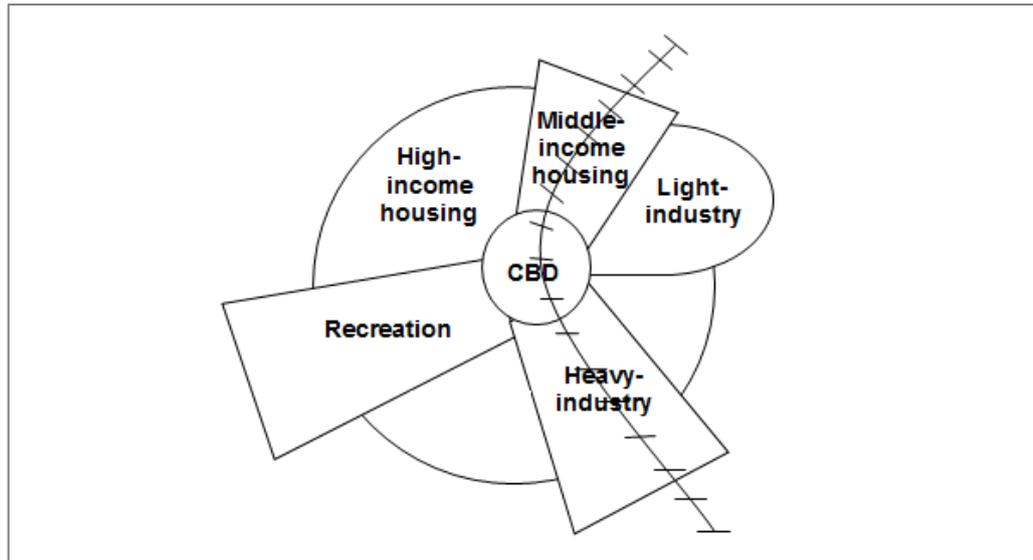
Route that has the advantage of access usually will have development along the routes. It is surrounded by main Makkah-Jeddah highway from North and extension of Ibrahim Al-Khalil Road and road to Laith, South of Jeddah on the Red Sea coast to the South. The project site is comprises of two areas “A” and “B”, with total area of 131 hectares as follows:

- The Northern Area (Area A) consisting of 68 hectares is planned for Lower Income Housing in the form of high density apartment buildings. The design, at this area, incorporated four different residential types and ended in reaching about 2550 different dwellings allocated on 220 Plots.
- The Southern Area (Area B) consisting of 63 hectares is planned for a low density, secured residential compound of single family

housing. The design, at this area, incorporated similar plan of duplex villa with four different alternatives for the elevations, and ended in reaching about 750 Villa within the compound. The two housing areas (Area A&B) are separated by an east-west linear parkway, as indicated in the overall Master Plan. North and South of the Bawabat site, further urban growth is possible. This has the potential to establish the area as Makkah's major location for future urban expansion. The large subdivision immediately to the South of the Bawabat site is already under development. This is predominant to small urban towns with potential growth due to population and, religious activities.

4.4 Sector Model

Sector model (Figure 4.4) was developed by Homer Hoyt a land economist in 1939. The model develops in a series of sectors not rings. The model postulated that classification of zoning depends upon class discrimination. Low income housing is located near heavy industries to provide easy access to workers. High income housing is placed further away from heavy industries as these types of people prefer peaceful, privacy and devoid of traffic congestion. The diagram shows that during the 1930's railway, tram, sea ports form the main mode of transportation cut across the CBD. Hoyt theorized that cities tended to grow in a wedge-shape pattern where there is a concentration of commercial activities in the CBD. Other uses such as housing and manufacturing would develop in a wedge shape surrounding transportation lines. The core argument for this model is that the upper class has influence on their choice of sites and they are located away from pollution and congestion.



CBD is centred on main transportation routes, thus land values are high along main transportation routes. High accessibility means high land values. To a certain extent, this model can be applied to Calgary, Canada. The layout of Calgary indicates the majority of the city's high cost housing in a narrow wedge with growth along the Elbow Valley. Slums were established in the 1930's outside the city but close to street car station. These are now incorporated in the city boundary, however are still pockets of low cost housing within the middle income housing.

4.5 Multiple-Nuclei Theory

The multiple nuclei model is developed by Harris and Ullman in 1945, and is the most complicated of the four models mentioned. This is the only model of the four that described and give insights into the growth of cities in the developing countries.

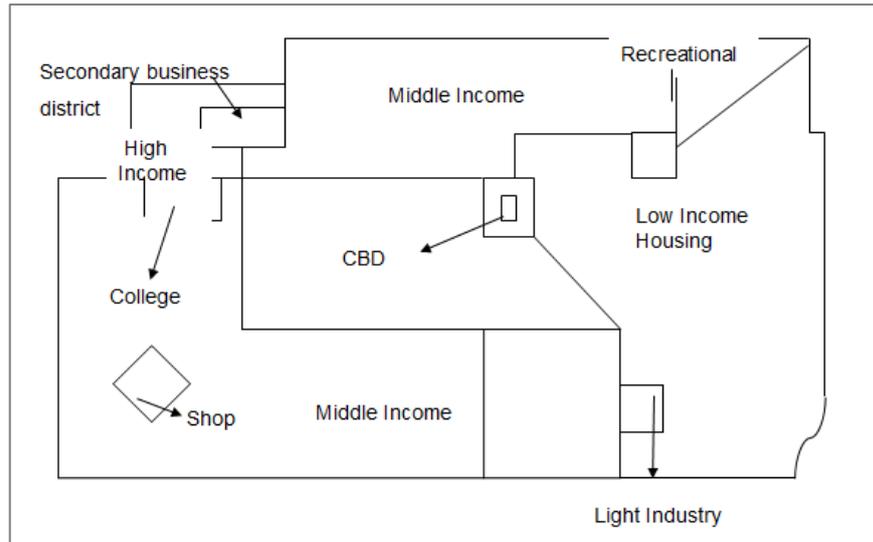


Figure 4.5: Multiple Nuclei Model

The multiple nuclei theory was formed based on the idea that people are free to move due to increase of car ownership. This model suggested that a city grows from several independent points as a result of activities of land uses for example industry, commercial, rather from one single CBD. When cities expanded, this will merge to form a single urban area. According to Harris and Ullman, the use of separate nuclei and differentiated district is a product of the combination of four factors:

1. *Some activities require specialised facilities*

For example retail area must be linked by intra-city accessibility, port facilities must have suitable water-front, while manufacturing need large tracts of land. The model suggested that in order for these activities to function well, access to transportation facilities should be given priority. The planning bye laws must be adhered so that there is no conflict of motorised route to avoid large trucks using residential areas. The conflict of access routes maybe seen in towns where heavy vehicle use residential roads, inevitably contribute to congestion, and accidents which is a social cost to society

2. *Some activities complement each other because cohesion entails profitability*

Urban activities such as retail will be grouped together as it will be convenient for customers to go for a shopping spree and compare prices before they decide to buy. Other uses such as financial institutions need commercial, retail and offices to complement their existence. Business entities will need financial facilities to expand as well as a keeper of business revenues. Related to financial facilities are the legal and clerical services which will speed up transaction.

3. *Some activities do conflict with each other*

Conflict in urban land use activities often leads to negative externalities or social costs that will be borne by society. Heavy concentration of vehicles, congestion will make education facilities deemed unsuitable as noise will be the main distraction. In similar vein, depreciation of land value of properties resulted in lack of demand or downward sales for property development. The ideal way of locating activities and enhancing value is to complement uses and having a system of separation of transportation routes. The current transportation route in Saudi Arabia caters for all types of vehicles, in addition there is no system that manages the timing of heavy vehicle usage. These have an impact on road safety and speed of transporting products which is an added cost to society and business.

4. *Some activities do not deserve paying high rent of the most desirable areas*

Some land uses for example low cost housing do not deserve to be located in strategic areas since it is best reserved for uses that have the highest and best use. There are also activities of storage and warehousing that should not occupy land that is best used for retail activities. The Saudi law on antiquities, museums and built heritage approval coincided with the recent inclusion of the Jeddah

Historical Area in the UNESCO World Heritage Site list, recognizing the old city's cultural value and unique model with its distinguished urban heritage. Historic Jeddah, the Gate to Makkah, was among the 26 new inscriptions decided at the 38th session of the World Heritage Committee of the UN Educational Scientific and Cultural Organization (UNESCO), held in Qatar (15-25 June 2014). UNESCO's decision highlights the Kingdom's historical position and its rich heritage and shows the depth of the Kingdom's culture and interaction with human civilizations throughout the centuries.

4.6 Alonso Theory

Alonso's extend his thesis on Von Thunen's agricultural model into urban land use. Basically Alonso Bid-Rent theory is a geography economic theory that refers how price and demand for real estate changes as distance from the Central Business District increase or decreases. However, for the ease of explaining the relationship between rental and distance, an improvise version of Alonso may be explained. As distance diminished from the CBD, residential rental also decreases and vice versa (Figure 4.6). During Von Thunen days, rental of land depends upon the fertility of the land, the further from the centre of the town, the lower the value of the land vis-a-vis the rental value. On similar basis, Alonso suggested that as intensity of land use diminished from the CBD, rental gets lower. Some argue that as land uses start to get further away from the CBD rental reciprocates distance. For example, if a person home is located about 25km from the CBD, the rental will drop to SAR400 per month, *ceteris paribus* (other things remain equal).

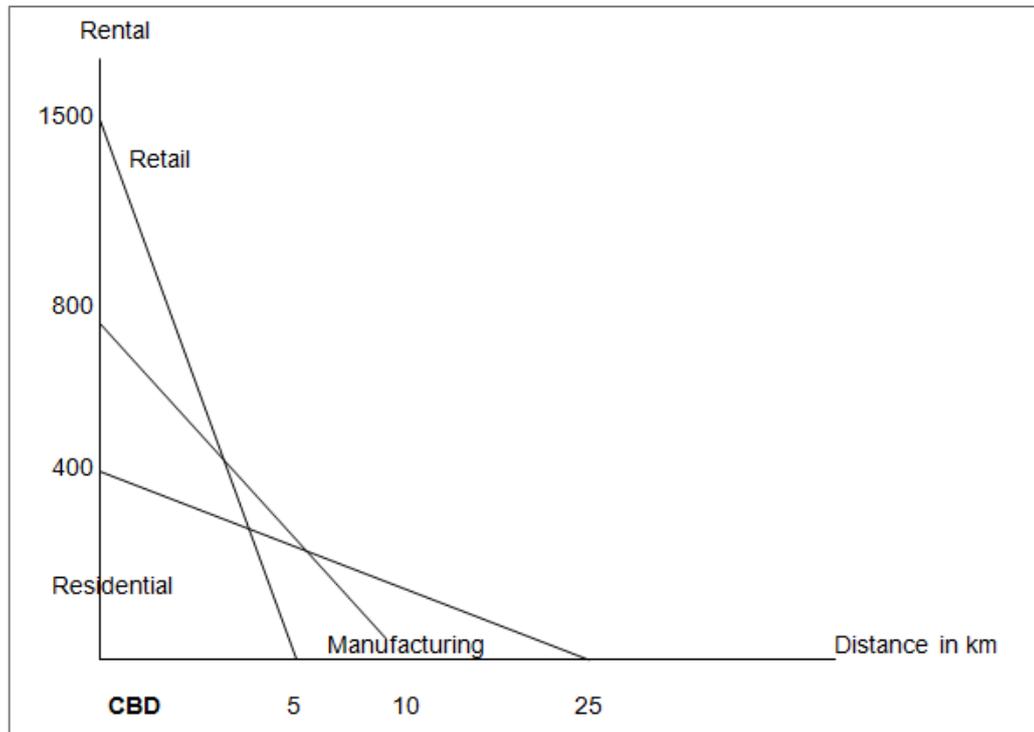


Figure 4.6: Alonso's Bid Rent theory

On the contrary, if the same person home is located about 5 km from CBD, rental will increase to SAR1500 per month, *ceteris paribus* however, modern land uses will normally equate to highest and best use provided that it is allowed under zoning conditions. The world's largest hotel is being planned for Mecca, Saudi Arabia, a remarkable structure that will rise out of the desert and apparently contain 10,000 rooms for worshippers. The hotel will be part of a mixed-use development at Abraj Kudai, a \$3.5bn (£2.25bn) project intended to look like a desert fortress, that encompasses a ring of towers standing on top of a podium.

Alonso Bid-Rent function depicts that land which has high accessibility will be occupied by retailers. The second less expensive will need larger tract of land will be reserved for manufacturers. Hence, land which is cheaper will be dominated by those who are willing to commute and having much lower rent than those who stay much nearer to the CBD but lower commuting cost.

4.7 Central Place Theory- Walter Christaller

The theory was first developed by the German geographer Walter Christaller (1933). The main idea in his theory is to test the relationship between economics and geography. His research concludes that people gather because their intention is to share goods and services and by grouping together it is just for pure economic reasons. Cities formed hierarchy where the largest city will be 21 kilometre apart between A and A. The second largest will be from B to B at 12 kilometres distance. Township or village i.e. from C to C will be 75 meters apart (Figure 4.7).

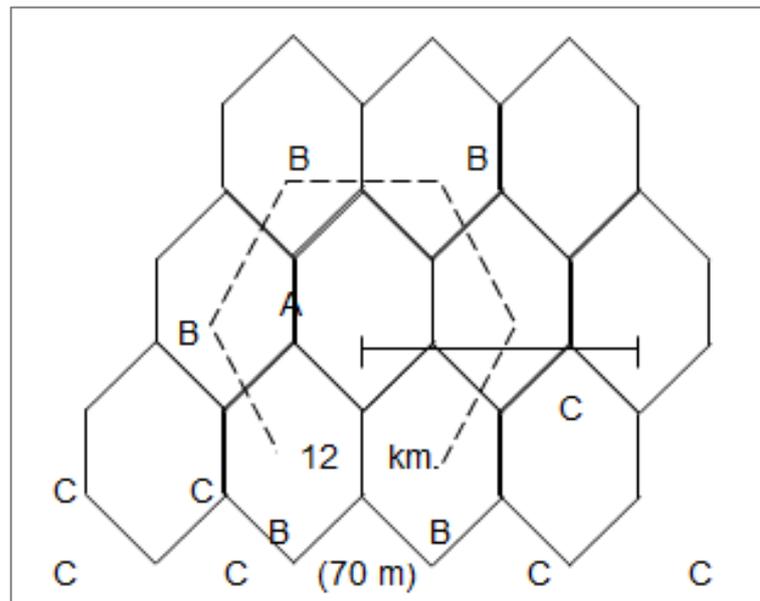


Figure 4.7: Central place theory

The hierarchy of the cities and towns are dictated by the variety of commodities which means that the higher the hierarchy of the cities and towns, the larger the variety of goods and services (Figure 4.8).

Highest order				X
High order			X	X
Low order		X	X	X
Lowest order	X	X	X	X
	Village	Town	City	Regional

Region

Figure 4.8: Hierarchies of cities/towns

Christaller's central place theory (Figure 4.9) consisted of two concepts (1) threshold (2) range of goods and services. From these two concepts the lower and upper limit of goods and services can be found.

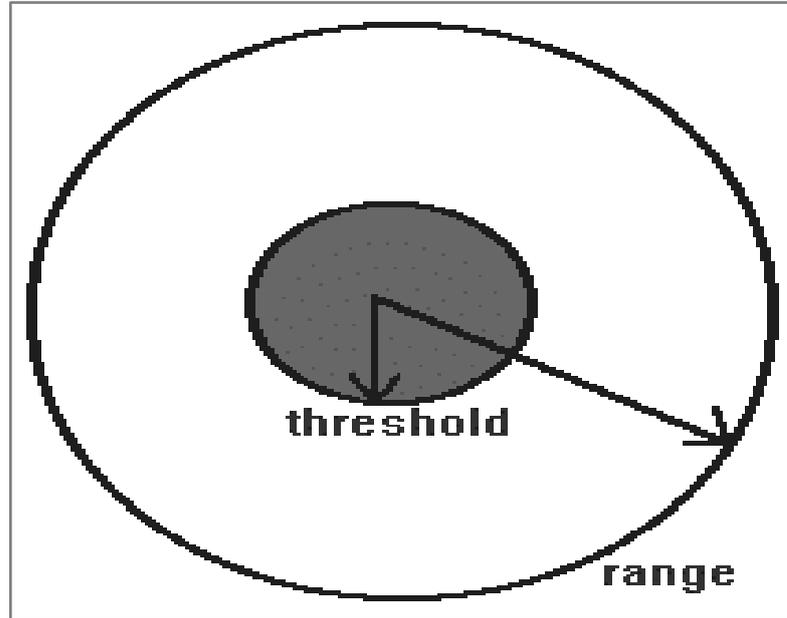


Figure 4.9: Christaller's central place theory

Christaller, suggested that a hexagonal shape of the market because circular shape will result in either un-served or over-served areas. Hence the new shape will result in fewer high order larger cities and towns in relation to the lower order towns and villages. To sum on Christaller's, the size of a city depends upon market area that serve goods and services. The people that buy goods and services would normally divide their demands based on needs and wants. Those goods in the need list will normally be within the vicinity of the populace. The wants list will depends on the higher order goods that are available within few kilometres or further away from customers home. Luxury goods such as cars, jewellery, and quality furniture are found in regional or larger cities, however, necessities are sold within villages or towns. Goods or services are supposed to be having a one way order of ranking, because as goods or services become complex, the availability is highly correlated with the higher catchment areas of regional or cities.

Exercise 3

1. Identify each statement below with the right model of land use:
 - a. It is a self-sufficient township which has no external influences. Land is of equal fertility and farmers sent their produce using ox carts since there are no roads. The concentrations of perishable produce are located in the middle of town where there is a concentration of people.
 - b. This model links income (socio-economic) of the population and distance. The model assumes that people will stay nearer to town centres to gain. The expansion and reconversion of land uses which a tendency to force outward in a set of concentric circles from CBD to the suburbs.
 - c. Development is located along major routes. The linear pattern of development takes advantage of accessibility, which is either egress or ingress. Some linear pattern take place initial either at the ingress or egress of routes.
 - d. The model develops in a series of sectors not rings. The model postulated that classification of zoning depends upon class discrimination.
 - e. This model was formed based on the idea that people are free to move due to increase of car ownership. This model suggested that a city grows from several independent points as a result of activities of land uses.
 - f. This is a geography economic theory that refers how price and demand for real estate changes as distance from the Central Business District increase or decreases.
 - g. This model concludes that people gather because their intention is to share goods and services and by grouping together it is just for pure economic reasons. Cities formed hierarchy by distance threshold.

5.0 REVIEW OF PRIMARY LAND USES

5.1 Residential

The pattern of residential development within the context of township has been the subject of an extensive literature. The factors that determine the specific location of residential development from among the number of potentially suitable sites available may be listed below:

- a. Physical suitability for development: slopes, soils, hydrology, land availability
- b. Legal restrictions, government regulations (zoning and other land use controls) Existing land use patterns and location of other residential development
- c. Access, including proximity to interstate highways
- d. Distance to employment sources
- e. Distance to shopping
- f. Availability of amenities (water, restaurants and shopping, golf, parks)
- g. Neighbourhood factors: age of surrounding housing stock, schools, crime
- h. Monetary policy for example incentives, and interest rate.

5.1.1 Supply Factors

Building new houses allows the residential property market to adjust to increased demand. In the long run supply will respond such that house prices tend towards the cost of new construction, which comprises the costs of the land on which new houses can be built, the costs of materials and labour required, and the associated financing and consenting costs. The cost of new construction determines both the equilibrium level of house prices in the long-

term and the incentive for new houses to be built in the short term. The number of houses built in a given period – and what this means for house prices – depends crucially on the responsiveness of housing supply. Geographical constraints on land availability can be important in some places. If people expect demand to increase in the future, house prices will tend to increase by more in geographically-constrained areas where people want to live. This will be particularly the case if the population is relatively immobile, whether due to preferences or the existence of one dominant city. When people can move easily, cities that face geographic or regulatory constraints will see less sustained and smaller long-term house price increases.

5.1.2 Demand Factors

The market to purchase property is much more than a market for accommodation. Demand to purchase a house is influenced by a range of factors, including the expected future costs and benefits associated with owning that property. Many of these payoffs are uncertain. Expectations of future house prices and mortgage interest rates influence how much a person is willing to bid for a house today. The more binding or pervasive supply constraints are, the more an increase in demand will result in rising house prices rather than increased building activity. In the long run, supply will respond to rising house prices, and house prices will return towards their equilibrium level, which is partly determined, by regulatory factors. But house prices can be subject to speculative dynamics in the short term: rising house prices can give rise to increased expectations of future house price appreciation, amplifying the increase in prices. This can occur even if there is no change in the number of households wishing to purchase a home. Potential purchasers will just bid more aggressively than otherwise.

5.2 Commercial

There are about 12 factors that influence value in real estate investment:

- a. Location- This is the most important for all forms of real estate. It is said that location, location, location is the answer to site selection.
- b. Highest and best use
- c. Cyclical demand
- d. Marketing time
- e. Market driven value
- f. Site vs. improvement
- g. Lease value
- h. Financing
- i. Zoning
- j. Taxation
- k. Competition
- l. Demographic
- m. Vehicle impact

Accordingly there about 4 factors that will determine urban land use:

- General Accessibility: This means the advantage of particular location in terms of movement cost and it largely depends on the transport facilities. The centre of the urban area has the greatest general accessibility and great demand for different land uses.
- Special accessibility: This refers to the matter of complementary uses. That means complementarily land uses tend to cluster to get the advantage of agglomeration.
- Complementarily may have different aspects. Shops selling comparison goods are clustering together to tap each other's trading market and enhancing the reputation of the locality for a particular good through greater choice offered to customers.

- **Additional Factors:** i. Historical Development ii. Topographical features iii. Size Dynamic Changes: Changes in real income and technical development both have an effect on the pattern of urban land values. On the demand side, with the ownership of the car and new retailing techniques, there is an increase in the land values in the suburbs relative to the inner urban area. **Institutional Factors:** Central government and Local government can influence the location decision through policies, taxation, and infrastructure. **Commercial location** can be categorized by various functions of the land use. In this case different kinds of goods and shops need to be identified and classified accordingly; (i) Specialty goods for example Jewellers, Oriental carpets, Work of arts, Ladies fashions, Musical instruments. (ii) Shopping goods for example. Furniture, Carpets, Coats, Dresses, Cameras, Radio & Television (iii) Convenience goods for example Groceries, Fruits & Vegetables, Confectionery, Tobacco and Newspapers, Hardware. The type of goods sold influences the shop location. Specialty and shopping goods are purchased frequently and irregularly but account for a significant proportion of people’s income and usually high income elasticity of demand.

5.3 Industrial

Industrial site selection factors may be divided into a) Physical b) Socio economic (human) factors. As a general rule older industries demonstrate that physical factor as the main deciding factor, while newer industries are based on economic factors.

Physical Factors	Socio-economic Factor
a. Accessibility	a. Capital
b. Climate	b. Communication
c. Land	c. Government policy
d. Power	d. Labour supply

The chief factors influencing the choice of location of most industries have been access to a suitable labour market and to adequate transport

facilities, whether road, rail or port. Other factors affecting special types of industry include access to adequate power, water and effluent disposal facilities where industries are heavy users of power and water; proximity to distribution centres or to other allied industries; and isolation from residence and other industry where the processes of manufacture are dangerous or offensive.

5.3.1 Labour

The general shortage of industrial labour throughout Saudi Arabia has probably been the dominant factor in determining the location of most new factories, especially in the lighter range of industries. Clothing, textiles, light engineering and plastics are all fields that have shown a tendency to decentralise in search of new sources of labour in the growing outer suburbs. The trend is strongest in clothing, textiles and plastics which depend mostly on female labour, and follows the pattern of establishing a series of small factories in outer suburbs to attract and absorb local labour.

Most industries tend to draw labour from a fairly wide area, although in general, most factory labour is obtained from the surrounding industrial districts. It has already been shown that most of the unskilled manual labour force lives in the central, northern and western suburbs, and most of the administrative and clerical labour in the eastern and southern suburbs, while the skilled manual labour force is more evenly distributed throughout all districts. In general, skilled factory and administrative labour is much more mobile and is drawn from a wider area than unskilled labour.

5.3.2 Transport Facilities

With the constantly growing importance of motor transport to all sections of industry, good access to main roads and highways is a vital factor in the location of all industry. In general, industries whose metropolitan transport costs form a high proportion of total production costs require more centralised locations than industries whose transport costs are lower. The majority of service industries involving metropolitan distribution such as newspaper establishments, biscuit, ice-cream and canister manufacturers, large bakeries, dry cleaners and milk pasteurisation plants endeavour to secure a central location. Of the heavier industries, timber and joinery, cardboard and paper mills, and sections of the automobile and oil industries also need locations which minimise transport problems. Relatively few sections of industry today need direct access to a port.

The advent of motor transport and other modern methods of handling bulk cargoes, such as pipe lines and conveyor belts, have resulted in a more economical use of port space, and have enabled many industries which formerly required sites immediately alongside port to move from the waterfront. Where goods have to be offloaded from ships on to some form of motor transport, it is normally just as easy for a vehicle to transport the goods two miles as a hundred yards. It is normally uneconomic for a ship to berth at a private port when it carries a mixed cargo, and therefore, unless an industry is sufficiently large to charter a complete shipment for itself it does not normally require direct access to a wharf.

The industries which have the highest demand for direct port access are those receiving or despatching complete bulk

shipments of materials by sea, such as certain of the basic chemical industries like fertiliser manufacture and sugar refining. The oil industry depends on bulk shipments of crude oil and petroleum from abroad and requires direct connection by pipe line from oil berths to storage tanks. The timber industry receives most of its timber by sea in bulk shipments, and it is desirable that the larger distributing organisations at least be located as close as possible to the timber port because of the heavy bulk freight involved.

5.3.3 Power, Water, Effluent Disposal

Most heavy industries are big users of electric power according to size and continuity of operations. The following industries are relatively heavy users of water and most require special effluent disposal facilities:—basic chemicals, paper and cardboard, textiles, dyeing and dry cleaning, breweries, milk pasteurising and bottling, soap manufacturing, tanneries, and certain food products, spinning and weaving.

5.3.4 Distribution

Most service industries such as large bakeries, dry cleaners, biscuit and ice-cream manufacturers, milk pasteurising establishments, newspaper houses and large timber yards, because of their function of direct distribution, require to be reasonably centrally located in respect to the region they serve to avoid excessive transport costs.

Other industries, such as printing establishments, tanneries, foundries, certain specialised engineering establishments and furriers, require being centrally located in relation to the range of

industry dependent on them. Other industries need to be near those to which they are closely linked—e.g. meat canners near abattoirs or slaughter yards, automobile parts manufacturers near large automobile assembly plants, canister manufacturers near canning plants. Once a major industry has been established dependent industries naturally tend to congregate around it. This pattern of linkage is a complex one, and has a very important bearing on traffic and the whole economic functioning of industry. The decentralisation of certain industries could increase traffic and transport costs, and the problem of industrial decentralisation even within the metropolitan area must be approached with care.

Exercise 4

1. Name three (3) types of primary land use.
2. List factors that contribute to the development of residential land use.
3. What are the factors that influence value in commercial real estate investment?
4. Identify physical and socio-economic factors that determine the selection of industrial site.

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1.0 INTRODUCTION TO PROPERTY INVESTMENT ANALYSIS

Investment is the act of denying oneself of the immediate consumption of one's resources for the benefit of periodic returns over time. It is a process of using money to make more money. Taking an investment decision requires an investor to reflect upon a number of fundamental principles about the potential investor's need and the range of investment options in the investment world. People invest to create and preserve wealth. Investment opportunities ranges from savings deposit in a bank, buying of shares of companies in the stock market, bonds and other securities (paper) investments, oil and gas business, as well as real estate (property) investments.

Savings generally involves depositing cash (money) into a bank or savings & Loans (Building Societies) account or in the money market which is adjudged relatively safe with less risk. In return, an interest is paid at a fixed and low rate to the depositor. Generally, savings plan does not earn enough return to create wealth over the period and inflation can even erode the interest gain. Investment on other asset class results in wealth creation but accompanied with a level of risk and the higher the risk, the higher the expected return. Though both the value of investment and income from them can experience rise or fall as the market condition may reflect.

1.1 Investment Principle

Investment decision requires a great level of discipline and planning. The potential investor should be able to:

- a. Define investment goals and time frame
- b. Identify investment options in the market
- c. Understand asset allocation and
- d. Identify potential risk

Investments are classified into two, income and growth assets (investments). The requirement of an investor determines how he allocates in resources to the asset class and develops an investment plan. The investment goal and time frame determines the choice of investment option of an investor. For instance, maximising amount of income received is different from building financial security for ones' family in terms of both the goal and time frame. The qualities of an ideal investment include

1. Security of capital
2. Security and regularity of income
3. Income and capital growth
4. Liquidity of investment
5. Ease of management

1.2 Income Producing Properties

Investment in properties cuts across all property types. Nearly all classes of property types are now income producing such as rental residential properties, commercial (office and retail) properties, hotels and tourism properties, healthcare, warehousing/logistics, industrial and agricultural properties. Home ownership (residential properties) constitutes a significant proportion of property investment because of the quest for shelter of people. However, for property investors who desire to increase their exposure in property investments, engaging in commercial property investment is possible. Real estate properties are usually purchased with the intention of earning a return on the investment (purchase), either through rental income, capital gain from the future resale of the property, or both. An investment property can be a long-term endeavour, such as an apartment building, or an intended short-term investment in the case where a property is bought, remodelled or renovated, and sold at a profit. An investment property is like any other investment: the goal is to generate a profit. The way in which a property is used has a significant impact on its value.

2.0 REAL ESTATE INVESTMENT PERFORMANCE

Investment performance is expressed in term of the rate of return on capital invested. The measurement involves the calculation of the return realised over some time interval. The return is made up of (i) capital gain – the difference between market value of the investment at the end and the value at the beginning of the assessment period, and (ii) any distribution in form of dividend made in the period of assessment.

$$\text{Return} = \frac{\text{Capital Gain} + \text{Dividend}}{\text{Market Value at the beginning of assessment period}}$$

$$R = \frac{MV_1 - MV_0}{MV_0}$$

Illustration

Consider an investment with market value of SAR260,000,000 at the beginning of a year. The market value grows to SAR295,000,000 by the end of the year. The investment distributed an income of SAR8,000,000 to the investors in the year under review. What is the investment return?

$$\begin{aligned} R &= \frac{\text{SAR} [(295,000 - 260,000) + 8,000,000]}{\text{SAR } 260,000,000} \\ &= 0.1654 \\ &= 16.54\% \end{aligned}$$

The Net Asset Value (NAV) is another measure of investment performance. NAV is arrived at by deducting all liabilities from the market value of the portfolio and dividing the difference by the number of outstanding shares of the concerned entity/investment.

An index performance measure has been employed in evaluating investment/portfolio performance. A Sharpe ratio is a return-risk ratio which is been employed in performance measurement.

$$\text{Sharpe Ratio (SR)} = \frac{\text{Portfolio return} - \text{Risk free return}}{\text{Standard deviation of portfolio}}$$

2.1 Financial Statements

A financial statement (or financial report) is a formal record of the financial activities and position of a business, person, or other entity. These are written reports that quantify the financial strength, performance and liquidity of a company. Relevant financial information is presented in a structured manner and in a form easy to understand. The objective of financial statements is to provide information about the financial position, performance and changes in financial position of an enterprise that is useful to a wide range of users in making economic decisions. Financial statements should be understandable, relevant, reliable and comparable. Reported assets, liabilities, equity, income and expenses are directly related to an organization's financial position. Financial statements are intended to be understandable by readers who have "a reasonable knowledge of business and economic activities and accounting and who are willing to study the information diligently. Financial statements may be used by users for different purposes:

Owners and managers require financial statements to make important business decisions that affect its continued operations. Financial analysis is then performed on these statements to provide

management with a more detailed understanding of the figures. These statements are also used as part of management's annual report to the stockholders.

Employees also need these reports in making collective bargaining agreements (CBA) with the management for their compensation, promotion and rankings.

Prospective investors make use of financial statements to assess the viability of investing in a business.

Financial institutions (banks and other lending companies) use them to decide whether to grant a company loan.

There are four (4) main types of financial statements namely

- **Balance Sheet**

Balance sheet is also known as the Statement of Financial Position. It presents the position of an entity financially for a given business period showing the assets, liabilities and the owners' equity.

- **Income Statement**

Income statement is also known as the profit and loss statement. It reflects the comprehensive records of receipts and expenses made in a business year of an enterprise. The income statement reveals the entity's financial performance in terms of net gain or loss over a specified period.

- **Cash Flow Statement**

Cash flow statement presents the movement in cash and bank balances over a period. This includes the operating, investing and financial activities records.

- **Statement of Changes in Equity**

This is also known as the Statement of Retained Earnings showing details movement of owner's equity over a period as derived from net profit or loss, share capital issue, dividend payment, capital gains or losses and effects of changes in accounting policy.

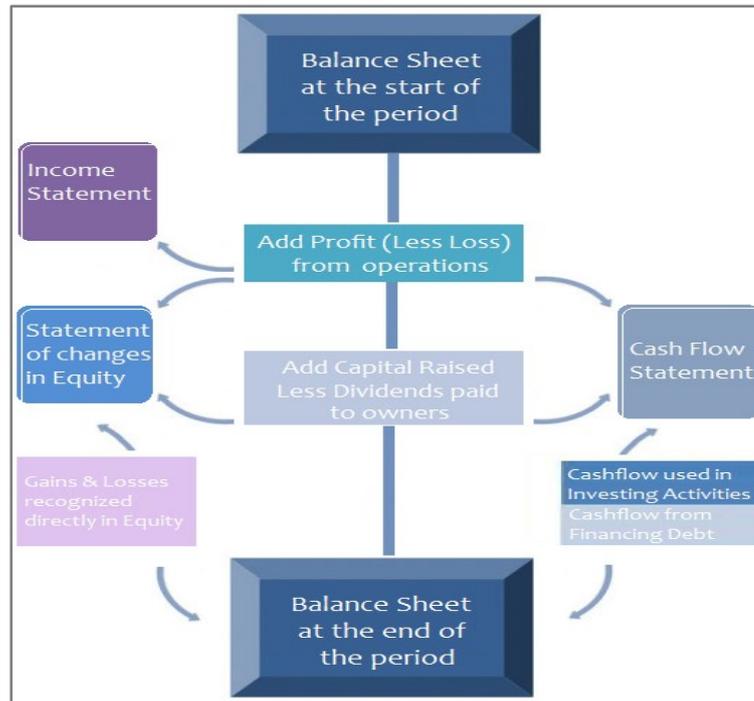


Figure 2.1: Link between financial statements

2.2 Balance Sheets

In financial accounting, **balance sheet** or **statement of financial position** is a summary of the financial balances of a business organization, are listed as of a specific date, usually the end of a financial year. A standard company balance sheet has three parts: assets, liabilities, and ownership equity. The main categories of assets are usually listed first and typically in order of liquidity followed by liabilities. The difference between the assets and the liabilities is known as equity. Another way to look at the balance sheet equation is that total assets equals liabilities plus owner's equity. Looking at the equation in this way shows how assets were financed: either by borrowing money (liability) or by using the owner's money (owner's or shareholders' equity). Balance sheets are usually presented with assets in one section and liabilities and net worth in the other section with the two sections "balancing".

A balance sheet summarizes an organization or individual's assets, equity and liabilities at a specific point in time. Two forms of balance sheet exist. They are the report form and the account form. Individuals and small businesses tend to have simple balance sheets. Larger businesses tend to have more complex balance sheets, and these are presented in the organization's annual report. A balance sheet is often described as a "snapshot" of a company's financial condition.

Small Business Balance Sheet

Assets (current)		Liabilities and Owners' Equity		
Cash	\$6,600	Liabilities		
Accounts Receivable	\$6,200	Notes Payable	\$5,000	
Assets (non-current)		Accounts Payable	\$25,000	
Tools and equipment	\$25,000	<i>Total liabilities</i>		\$30,000
		Owners' equity		
		Capital Stock	\$7,000	
		Retained Earnings	\$800	
		<i>Total owners' equity</i>		\$7,800
Total	\$37,800	Total	\$37,800	

Statement of Financial Position helps users of financial statements to assess the financial soundness of an entity in terms of liquidity risk, financial risk, credit risk and business risk. Below is an illustrative example of a Statement of Financial Position prepared under the current accounting format.

Statement of Financial Position as at 31st December 2013

	Notes	2013 MYR	2012 MYR
ASSETS			
Non-current assets			
Property, plant & equipment	9	130,000	120,000
Goodwill	10	30,000	30,000
Intangible assets	11	60,000	50,000
Total non-current asset		220,000	200,000
Current assets			
Inventories	12	12,000	10,000
Trade receivables	13	25,000	30,000
Cash and cash equivalents	14	8,000	10,000
Total current asset		45,000	50,000
TOTAL ASSETS		265,000	250,000
EQUITY AND LIABILITIES			
Equity			
Share capital	4	100,000	100,000
Retained earnings		50,000	40,000
Revaluation reserve	5	15,000	10,000
Total equity		165,000	150,000
Non-current liabilities			
Long term borrowings	6	35,000	50,000
Current liabilities			
Trade and other payables	7	35,000	25,000
Short-term borrowings	8	10,000	8,000
Current portion of long-term borrowings	6	15,000	15,000
Current tax payable	9	5,000	2,000
Total current liabilities		65,000	50,000
Total liabilities		100,000	100,000
TOTAL EQUITY AND LIABILITIES		265,000	250,000

2.3 Gross Income Multiplier (GIM)

GIM is derived by dividing the value (sale price) of an investment property with the gross annual income or gross annual rental income of the property. It is commonly used in valuing both apartment complexes and commercial real estate but it does not consider operating costs, taxes and vacancies.

$$\text{GIM} = \frac{\text{Value}}{\text{Gross Income}}$$

The concept of the *GIM* is neither new nor limited in its application to the valuation of real property. In the real estate valuation field, for example, reference was made to its use as long ago as 1740, when Thomas Miles offered a variation of the income multiplier method. He suggested that to estimate the present value of the land the current rental should be multiplied by a specified number of years.'

A relationship can be drawn between the *GIM* and the price/earnings ratio, which is often used for stock valuation purposes. The price/earnings ratio of a company's stock is computed by dividing the market price of a share of its common stock by the company's earnings per share. For example, assume that ABC Sdn Bhd earned SAR2.00 for each share of outstanding common stock and the current market price of its stock is SAR36.00. The price/earnings ratio for ABC Corporation is SAR36.00/SAR2.00 or 18. It can be said that the stock of ABC Corporation is selling at a multiple of 18 times its earnings. In addition to its use in stock valuation, price/earnings ratio is considered by many security investors to be a good benchmark of value. Similarly, while the use of a gross income multiplier in valuing real estate is simple and direct. Perhaps one of the most compelling arguments for the use of the *GIM* is that it is a market-derived fact that does not rely on personal judgment or subjective conclusions. It takes into account, in one single ratio, all of the factors that market participants consider in pricing properties. The term *GIM* reflects the fact that some properties generate income from non-rental sources. Income Approach," the term "income" as opposed to the term "rent" implies that income other than rent may be derived from a property. These sources of income include, but are not limited to, parking fees, security deposits retained, and income from laundry facilities.

Exercise 1

1. In your own word, define investment?
2. What are the investment principles?
3. List the quality of ideal investment?
4. What are return's components?
5. Please identify how to calculate return.
6. What is financial statement?
7. Identify different type of financial statement
8. What is Gross Income Multiplier (GIM)

3.0 CAPITAL BUDGETING

Capital budgeting, or investment appraisal, is the planning process used to determine whether an organization's long term investments such as new machinery, replacement machinery, new plants, new products, and research development projects are worth the funding of cash through the firm's capitalization structure. Capital budgeting is a required managerial tool. One duty of a financial manager is to choose investments with satisfactory cash flows and rates of return. Therefore, a financial manager must be able to decide whether an investment is worth undertaking and be able to choose intelligently between two or more alternatives. To do this, a sound procedure to evaluate, compare, and select projects is needed. This procedure is called **capital budgeting**.

In reality, any firm has limited borrowing resources that should be allocated among the best investment alternatives. One might argue that a company can issue an almost unlimited amount of common stock to raise capital. Increasing the number of shares of company stock, however, will serve only to distribute the same amount of equity among a greater number of shareholders. In other words, as the number of shares of a company increases, the company ownership of the individual stockholder may proportionally decrease. The argument that capital is a limited resource is true of any form of capital, whether debt or equity (short-term or long-term, common stock) or retained earnings, accounts payable or notes payable, and so on. Even the best-known firm in an industry or a community can increase its borrowing up to a certain limit. Once this point has been reached, the firm will either be denied more credit or be charged a higher interest rate, making borrowing a less desirable way to raise capital. Faced with limited sources of capital, management should carefully decide whether a particular project is economically acceptable. In the case of more than one project, management must identify the projects that will contribute most to profits and, consequently, to the value (or wealth) of the firm. This, in essence, is the basis of capital budgeting.

The basic steps of capital budgeting are:

1. Estimate the cash flows
2. Assess the riskiness of the cash flows.
3. Determine the appropriate discount rate.
4. Find the PV of the expected cash flows.
5. Accept the project if PV of inflows > costs

Some of the techniques used in capital budgeting are discussed in following sections.

3.1 Time Value of Money

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. The time value of money tells us that receiving cash today is more valuable than receiving cash in the future. The reason is that the cash received today can be invested immediately and will begin growing in value. For instance, if a company receives SAR1,000 today and it is invested at 8% per year, the company will have SAR1,080 after 365 days.

A time value of money of 8% per year also tells us that receiving SAR1,080 one year from now is comparable to receiving SAR1,000 today. With a time value of money of 8% per year, accountants will state that receiving SAR1,080 in one year has a *present value* of SAR1,000. In accounting, a time value of money of 8% means that a company performing services today in exchange for cash of SAR1,080 in one year has earned SAR1,000 of service revenues today. The SAR80 difference will become interest income as the company waits 365 days for the money.

Illustration: Discounting a Cash Flow

Assume that you are currently leasing an office space, and expect to make a lump sum payment to the owner of the real estate of SAR500,000 ten years from now. Assume also that an appropriate discount rate for this cash flow is 10%. The present value of this cash flow can then be estimated:

$$\begin{aligned} \text{Present Value of Payment} &= \frac{\text{SAR } 500,000}{(1.10)^{10}} \\ &= \text{SAR } 192,772 \end{aligned}$$

3.2 Net Present Value

NPV of an investment/property allows an investor to make a decision about an investment plan. The decision rule is that present value of all benefits/incomes must not be less than the present value of all expenses (costs).

$$NPV = PV_{\text{benefit}} - PV_{\text{cost}}$$

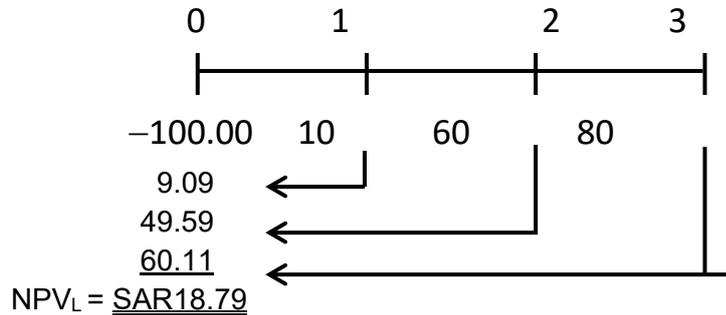
$$NPV = \sum_{t=0}^n \frac{CF_t}{(1+k)^t}$$

Consider two projects L and S with the cash flows presented in the table below.

Three years Cash flows of Projects L and S

Year	Project L	Project S
0	(SAR100)	(SAR100)
1	10	90
2	60	30
3	80	50

Project L:



Following the same process above for Project S,

NPV_S = SAR19.98

If the projects are independent, accept both.

If the projects are mutually exclusive, accept Project S since NPV_S > NPV_L.

Note: NPV declines as k increases, and NPV rises as k decreases.

3.3 Internal Rate of Return

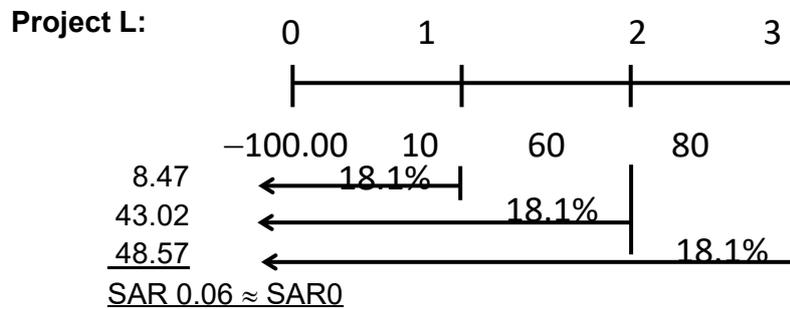
Sometimes, instead of computing the value of an investment property with a given rate of return, the expected return (IRR) is to be calculated

for a given property price/value. The challenge is to find the discounting rate that will make the cash flows (in and out). The decision rule therefore is to

- i. maximise differences in the IRR and required return of mutually exclusive alternatives
- ii. Do not accept when $IRR < \text{required return}$.

From the previous example:

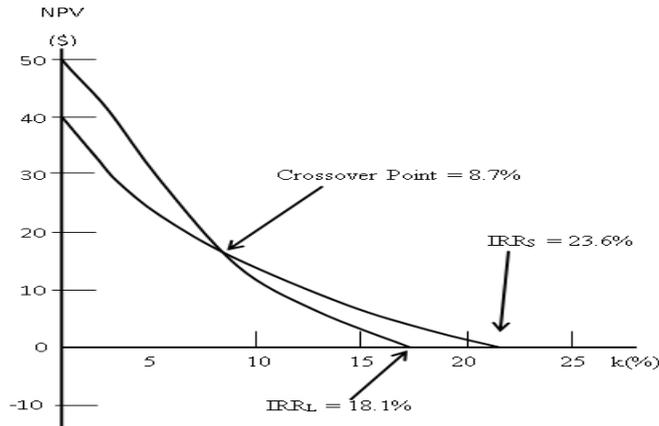
$$IRR: \sum_{t=0}^n \frac{CF_t}{(1 + IRR)^t} = SAR\ 0 = NPV$$



$IRR_L = 18.1\%$
 $IRR_S = 23.6\%$

If the projects are independent, accept both because **IRR > k**.
 If the projects are mutually exclusive, accept Project S since $IRR_S > IRR_L$.
Note: IRR is independent of the cost of capital.

K	NPV _L	NPV _S
0%	SAR50	SAR40
5	33	29
10	19	20
15	7	12
20	(4)	5



Exercise

An investment requires a capital outlay of SAR 2,500,000 and it is capable of generation annual revenue of SAR 150,000 for the first 3 years and SAR 200,000 for another 3 years after which the investment will worth SAR 2,000,000 at disposal. Estimate the internal rate of return of the investment.

Estimate

Recall:

$$NPV = R_1 + \frac{R_2}{(1+i)^1} + \frac{R_3}{(1+i)^2} + \frac{R_3}{(1+i)^3} + \dots + \frac{R_n}{(1+i)^{n-1}} + \frac{V_n}{(1+i)^n}$$

Where R is yearly revenue/income, i is the return and n is number of years of holding the investment.

The net present values (NPV) is the difference between present values (PV) of all the income and expenses (cash flows) over the life of the investment and it is expected to equal the initial capital outlay.

Note:

$$IRR = r_1 + \left[\frac{(r_2 - r_1) \times NPV_{r_1}}{NPV_{r_1} + NPV_{r_2}} \right]$$

Where r_1 and r_2 are the two rate of return that get closest present values to the capital outlay ($r_1 < r_2$).

Year	Cash Outflow – expenses (RM)	Cash Inflow – income (RM)
------	------------------------------	---------------------------

0	Initial Capital Outlay – 2,500,000	Nil
1		150,000
2		150,000
3		150,000
4		200,000
5		200,000
6		200,000
6		Expected Sales Value – 2,000,000

Adopting a 4% rate of return

$$\begin{aligned}
 NPV &= 100,000 + \frac{100,000}{(1+0.04)^1} + \frac{100,000}{(1+0.04)^2} + \frac{200,000}{(1+0.04)^3} + \frac{200,000}{(1+0.04)^4} + \frac{200,000}{(1+0.04)^5} + \frac{2,000,000}{(1+0.04)^6} \\
 &= SAR 2,526,707.94
 \end{aligned}$$

Since this NPV is above the capital outlay, we adopt a higher rate of return that may likely give a NPV that will be lower than the capital outlay. Thus a trial of 5% (it can be higher but the earlier value was just slightly greater than the investment outlay).

Adopting 5% rate of return

$$\begin{aligned}
 NPV &= 100,000 + \frac{100,000}{(1+0.05)^1} + \frac{100,000}{(1+0.05)^2} + \frac{200,000}{(1+0.05)^3} + \frac{200,000}{(1+0.05)^4} + \frac{200,000}{(1+0.05)^5} + \frac{2,000,000}{(1+0.05)^6} \\
 &= SAR 2,415,313.06
 \end{aligned}$$

NPV @5% is lower than the capital outlay, this means that the IRR lies between 4% and 5%, therefore we substitute in IRR formulae.

$$\begin{aligned}
 IRR &= r_1 + \left[\frac{(r_2 - r_1) \times NPV_{r_1}}{NPV_{r_1} + NPV_{r_2}} \right] \\
 IRR &= 0.04 + \left[\frac{(0.05 - 0.04) \times 2,526,707.94}{2,526,707.94 + 2,415,313.06} \right] \\
 &= 0.04 + 0.0051 \\
 &= 0.0451
 \end{aligned}$$

Multiply by 100

$$IRR = 4.51\%$$

3.4 Payback Period

Payback period in capital budgeting refers to the period of time required to recoup the funds expended in an investment, or to reach the break-even point with no consideration for time value of money. Payback period estimates the expected number of years required to recover a project's cost. Like other financial metrics for cash flow analysis, the payback period metric takes essentially an "Investment view" of an action or investment and its expected cash flow stream. Payback period for an action or investment is the time required for cumulative returns to equal cumulative costs. Payback period is usually given in decimal years presented like this:

Year	Project L	Project S
0	(SAR100)	(SAR100)
1	10	90
2	60	30
3	80	50

$$\begin{aligned} \text{Payback}_L &= 2 + \frac{\text{SAR } 30}{\text{SAR } 80} \text{ years} \\ &= 2.4 \text{ years} \\ \text{Payback}_S &= 1.6 \text{ years} \end{aligned}$$



In case they are even, the formula to calculate payback period is:

$$\text{Payback Period} = \frac{\text{Initial Investment}}{\text{Cash Inflow per Period}}$$

When cash inflows are uneven, we need to calculate the cumulative net cash flow for each period and then use the following formula for payback period:

$$\text{Payback Period} = A + \frac{B}{C}$$

In the above formula:

- **A** is the last period with a negative cumulative cash flow;
- **B** is the absolute value of cumulative cash flow at the end of period A;

- C is the total cash flow during the period after A

Exercise 2

1. What is capital budgeting?
2. What are the basic steps in capital budgeting?
3. Explain the concept of ‘time value of money’.
4. What is the formula for present value of money?
5. Give the rules for net present value and its formula.
6. How to calculated expected return (IRR)?
7. What is payback period? Please provide formula in (i) even cash flow inflow; and (ii) uneven cash flow inflow.

4.0 PORTFOLIO AND DIVERSIFICATION

With the adequate understanding of the investment goal, time frame and level of risks, portfolio construction (asset allocation) is an important strategy for a successful investment. Portfolio construction involves a selection of a mix of different asset classes and how much money is to be allocated to each asset class to meet the investment objectives. The categories of asset classes that abound in every investment market include cash, equities, bonds and property.

Setting an investment objective involves a thorough analysis of the investing entity (Individual and/or Institutional) with regards to the investment expectations. Institutional investors include Pension Funds, Depository Institutions, Insurance Coys, Regulated Investment Coys, Endowments & Foundations as well as Treasury department of Corporations, Governments and Government Agencies.

Asset allocation decision is a decision by investors on how the funds to be invested should be distributed among major classes of assets or investment options (stocks, bonds, cash or real estate). Investors have different objectives and as a result allocate their resources into the different assets at different proportions that reflect their investment goal. Investment markets moves in cycles and reflects both the strength of an economy and the investors’ sentiment. The table below shows the yearly return of the UK major asset classes for a period of 21 years (1994-2014). The highest return for each year is highlighted in blue fill.

Return (%) of major assets in UK for period 1994-2014

Year	Equities	Bonds	Cash	Property
1994	-0.68	-2.41	6.68	-18.38
1995	20.38	19.26	6.56	20.58
1996	2,70	8.59	6.56	18.78

1997	19.60	11.82	7.69	-3.86
1998	20.62	12.57	6.26	-9.28
1999	30.92	1.05	6.08	12.40
2000	-7.14	9.93	5.90	22.81
2001	-13.69	8.34	4.11	-1.26
2002	-26.75	10.71	4.02	-7.04
2003	21.08	5.53	4.04	26.52
2004	7.93	8.04	4.89	28.65
2005	24.55	5.77	4.64	28.99
2006	6.60	3.30	5.32	24.87
2007	10.30	5.76	5.99	-8.52
2008	-19.48	7.59	2.77	-27.62
2009	20.56	5.30	0.61	23.09
2010	16.77	4.82	0.78	24.19
2011	-6.17	5.80	1.08	-5.12
2012	11.67	5.93	0.52	23.00
2013	21.15	0.04	0.53	2.45
2014	11.22	7.92	0.56	23.10

Source: Thomson Reuters data stream, Barclays and Bloomberg in Vanguard Asset Management, 2015 (www.vanguard.co.uk)

Construction of an investment portfolio deals with the selection of specific assets to be included in a portfolio of investments. An efficient portfolio provides the highest expected return for a given level of risk or equivalently, the lowest risk for a given expected return. This involves the estimations of expected return and level of risk. The main goal of portfolio and diversification (portfolio selection) is the construction of an investment portfolio which will maximise expected return consistent with an acceptable level of risk. Adopting historical data and expectation of future returns, a portfolio selection model is developed to quantify expected return and portfolio risk, thus, a method for the selection of optimal portfolio.

Portfolio diversification means the combination of different asset classes in an investment portfolio in such a manner that reduces the portfolio risk and maintaining the return. The following section discuss some theories/models that have been developing over time for the portfolio selection/asset allocation, following the Markowitz strategy of risk and return consideration which is mainly concerned with the degree of covariance between returns of different assets in a portfolio.

Assignment

Year	Equities	Bonds	Cash	Property
1994	6.8	12.41	6.68	18.38
1995	20.38	9.26	6.56	20.58
1996	4.70	8.59	6.56	18.78
1997	-5.60	-4.82	7.69	-13.86
1998	-3.62	4.57	6.26	-9.28
1999	5.92	3.05	6.08	12.40
2000	7.14	7.93	5.90	22.81
2001	13.69	8.34	4.11	11.26

2002	16.75	10.71	4.02	17.04
2003	14.08	15.53	4.04	16.52
2004	17.93	16.04	4.89	18.65
2005	24.55	15.77	4.64	18.99
2006	16.60	13.30	5.32	20.87
2007	10.30	5.76	5.99	-8.52
2008	5.48	7.59	2.77	7.62
2009	-2.56	5.30	4.1	8.09
2010	6.77	4.82	7.8	14.19
2011	16.17	5.80	9.8	8.12
2012	11.67	5.93	5.2	13.00
2013	21.15	6.4	5.3	20.45
2014	11.22	7.92	5.6	23.10

4.1 Risk and Portfolio Theory

Risk is the likelihood that an expectation may not be met. It is a chance that of the actual investment return being different from the expected returns. A number of risks can be of important consideration to an investor and for investment decision and planning. These risks include:

- Country Risk
- Currency Risk
- Inflation Risk
- Liquidity Risk
- Market Risk

Spreading the investment money across a number of assets (diversification) is one way to eliminate/reduce the effect of different risks and protect the capital invested and expected income. Diversification ensures that returns from better performing assets offsets the potential loss from low/non-performing asset class thus reducing the risk of a greater loss that can arise from a single asset.

The theory of portfolio selection is often referred to as mean-variance (portfolio) analysis which describes a standard or norm of behaviour that investors should follow in portfolio construction instead of predicting the actual behaviour of investors.

4.2 Modern Portfolio Theory

Modern Portfolio Theory (MPT) revolutionise the investment management world. Markowitz portfolios are portfolios that emerge from the principle of efficient portfolio where return maximisation and risk minimisation are the key objectives. There is a saying in the investment world that “the higher the risk, the higher the return”.

Markowitz theory however postulates the Return-Risk (Mean – Variance) model which involves the calculation of average portfolio return on one stage and the analysis of risk in the second stage. The investment risk is measured by the dispersion of the returns from the mean return of each investment. The use of standard deviation is therefore employed. For each investment option, expected average return is calculated using past return of each investment option over a period of time. To the expected return from each investment alternative is applied relevant weight and the return from each investment is added together to arrive at the portfolio return. This exercise is performed with varying weights (combinations) until the return is maximized.

$$R_P = W_A R_A + W_B R_B + \dots + W_Z R_Z$$

Where R_P = Portfolio Return, W = Asset Weight, R = average return, A, B...Z are investment classes.

To select the best investment combination which is regarded as the efficient frontier by Markowitz model having derived the average mean, the risk (standard deviation) is calculated for each investment combination options following the normal statistic calculation. The portfolio risk (Pr) is then estimated for each investment combination using the formula

$$(Pr)^2 = W_A^2 r_A^2 + W_B^2 r_B^2 + (2W_A W_B r_A r_B \times P_{AB})$$

$$P(r) = \sqrt{(Pr)^2}$$

Where A and B are the investments/assets classes in the portfolio, W is the Weight allocated to each asset class, r_A and r_B are the standard deviation of investment A and B, P_{AB} is the correlation between investments A and B which is Covariance of A and B divided by $r_A r_B$. The process involves:

- a. Determination of asset/investment allocation weight
- b. Calculating average return for investment A and B
- c. Variance of A and B
- d. Standard deviation of A and B
- e. Covariance between A and B
- f. Correlation of A and B

Efficient portfolio maximises expected return, given the standard deviation and the entire set of portfolio is referred to as the “efficient frontier”. The Markowitz efficient portfolio is thus created by searching through all possible combinations of the investment options available, in order to find that combination that maximises expected return at any given of risk level.

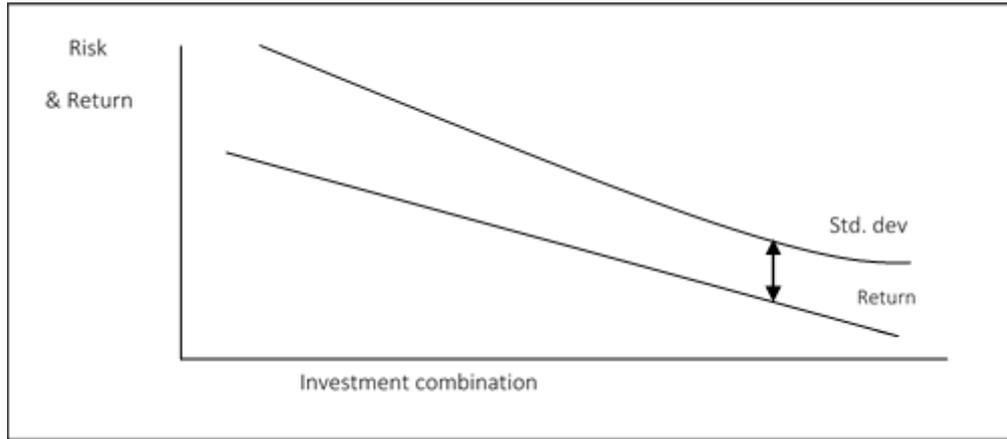


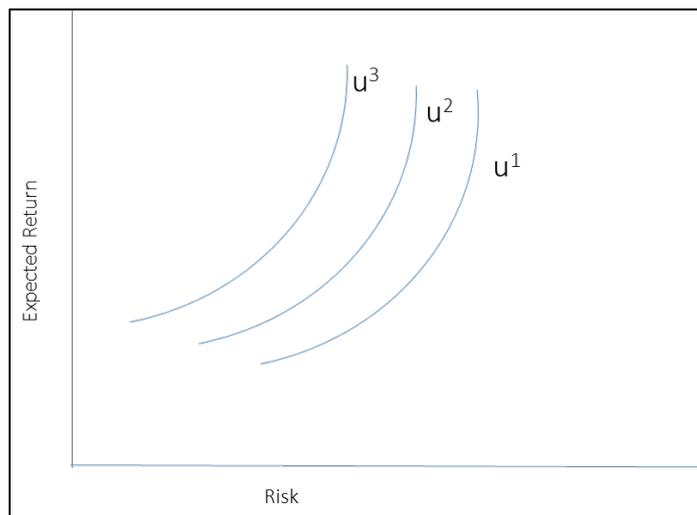
Figure 4.1: Markowitz's Efficient Frontier – (Avramov and Zhou (2010))

4.3 The Efficient Frontier

Investments/portfolios that provide highest expected return for a pre-determined risk level are called efficient portfolio. The lines that connect all these efficient portfolios are the efficient frontier. This follows the utility function indifferent curve. The Bayesian approach treats utility with portfolio weight (in Markowitz theory) as a random quantity. Thus, the utility maximisation is formulated as:

$$W^{Bayesian} = \text{avgmax}_w \int_{R_{t+1}} U(w) P(R_{t+1} / \emptyset T) dR_{t+1}$$

Where $U(w)$ is the utility of holding a portfolio weight (w) at time ($t+1$) and $\emptyset T$ is the data available at time (t).



Utility function indifferent curve of return-risk efficient portfolio

To assess the portfolio return (of a number of assets classes)

$$R_p = W_1R_1 + W_2R_2 + \dots + W_gR_g$$

$$R_p = \sum_{g=1}^n W_gR_g$$

Where:

R_p = Portfolio return

W = Weight of asset in the portfolio

R = Rate of return of an asset in the portfolio

g = number of assets in the portfolio.

Portfolio risks are measured using well known statistical tools of standard deviation (SD) and variance (Var). Variance measures the dispersion of possible outcomes around the expected mean value. The variance is converted to the standard deviation by simply getting its positive square root.

$$S.D. = \sqrt{Var}$$

4.4 Sensitivity Analysis

A sensitivity analysis is a technique used to determine how different values of an independent variable will impact a particular dependent variable under a given set of assumptions. This technique is used within specific boundaries that will depend on one or more input variables, such as the effect that changes in interest rates will have on a bond's price. Sensitivity analysis is a way to predict the outcome of a decision if a situation turns out to be different compared to the key prediction(s). Sensitivity Analysis (SA) is defined as “a method to determine the robustness of an assessment by examining the extent to which results are affected by changes in methods, models, values of unmeasured variables, or assumptions” with the aim of identifying “results that are most dependent on questionable or unsupported assumptions”. It has also been defined as “a series of analyses of a data set to assess whether altering any of the assumptions made leads to different final interpretations or conclusions”. Essentially, SA addresses the “what-if-the-key-inputs-or-assumptions-changed”-type of question.

Decision making is an integral part of investment management. A decision maker need to have some indication of how sensitive an alternative choice might be to the changes in one or more of the values

of the predicting variables. Though, it is not possible to explore all the possible combinations of all the variables in a typical problem. Nevertheless, there are some elements that a decision maker can use to assess the sensitivity of assumption probabilities. One of the tools useful for the analysis in some decision making problems is sensitivity analysis. It provides a range of feasibility over which the choice of alternative remains the same. Successful decision making consists of several steps, the first and most important being carefully defining the problem. Sensitivity analysis is a process of varying input parameters of a model within allowed area and observing the resulting changes in the model solution. It explores how changes in the model output can be qualitatively and quantitatively attributed to different change sources. The purpose of sensitivity analysis is to indicate the sensitivity of simulation to uncertainties in the values of input data in the model. A generalized model is utilized that contains several independent variables, $X = (X_1, \dots, X_n)$, and one dependent variable Y , where $Y = f(X)$.

In a simplified way, sensitivity analysis is a systematic method for examining how the outcome of benefit-cost analysis changes with variations in inputs, assumptions, or the manner in which the analysis is set up. Once the benefits and costs for various alternatives have been identified, the benefits and costs that are largest and that differ most between alternatives have to be closely observed to establish a range for which there can be reasonably expected fall. The highest value and lowest value within the established range can be regarded as “high” and “low” or “optimistic” and “pessimistic” to reflect their probable effect on the benefit-cost measure. Then a “most likely” value should also be included. A matrix of the values and ratios are thereafter developed as presented in the tables below

Values of variables

Factor	Optimistic	Most likely	Pessimistic
Patrons/year	62,000	24,000	14,000
Operating costs/year	SAR50,000,000	SAR75,000,000	SAR100,000,000
Constructions costs	SAR250,000,000	SAR500,000,000	SAR800,000,000

With the benefit-cost analysis model established, a sensitivity analysis is then conducted by varying values of one variable at a time while other variables remain constant. This process is repeated for each variable to show how sensitive the measure (dependent variables) is to each and every determining variables.

Benefit-Cost Ratios

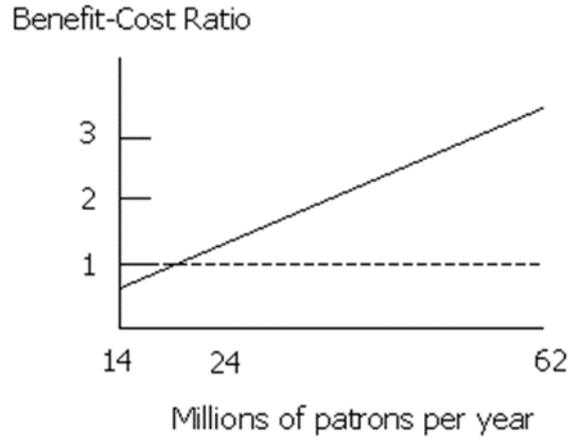
Factor	Optimistic	Most likely	Pessimistic
Patrons/year	3.2	1.2	0.7
Operating costs/year	1.3	1.2	0.9
Constructions costs	1.4	1.2	1.0

In this case the ratio is most sensitive to the **patronage estimate**. In such a case, it might be worthwhile to do further study to refine the patronage estimate.

A worst-case scenario might also be investigated, using the lowest benefits and highest costs. If the worst-case scenario for a particular investment/project yields a negative net present value, or a benefit-cost ratio less than one, then perhaps such investment/project should be removed from consideration. In sensitivity analysis, one can construct various likely scenarios such as:

- High construction cost, low patronage, low operating cost
- Most likely construction cost, low patronage, most likely operating cost

The benefit-cost measures can be graphed against the values of the different variables as shown in the figure below so that decision-makers can assess the outcomes based on their estimates of the likelihood of each. The decision-maker can look at the graph and see that fewer than 20 million patrons per year are needed to achieve a benefit-cost ratio greater than 1, but that even the most likely patronage estimate yields a ratio of only 1.2. This graph might be compared to one for an alternative, such as a bus system. Then a decision could be based on likely patronage for the two alternatives.



Exercise

A property investment is expected to yield gross revenue of MYR50,000. The goods and services tax (GST) of 6% inclusive. The rate of return is 5%. Determine the capital required for the investment. Estimate also the effect on capital if the investment could experience a revenue fall of 10% and the GST increase of 6% and yield increase by 10%.

Solution:

(i) Capital requirement for the investment

	MYR
Gross Revenue	50,000
Less GST @ 6%	<u>3,000</u>
Net Operating Income	47,000
YP in Perp @ 5%	<u>20</u>
Capital Required	<u>940,000</u>

(ii) Testing for 10% fall in Revenue

	MYR
Gross Revenue	45,000
Less GST @ 6%	<u>2,700</u>
Net Operating Income	42,300
YP in Perp @ 5%	<u>20</u>
Capital Required	<u>846,000</u>

(iii) Testing for 6% increase in GST

	MYR
Gross Revenue	50,000
Less GST @ 6.6%	<u>3,180</u>
Net Operating Income	46,820
YP in Perp @ 5%	<u>20</u>
Capital Required	<u>936,400</u>

(iv) Testing for 10% increase in Yield

	MYR
Gross Revenue	50,000
Less GST @ 6%	<u>3,000</u>
Net Operating Income	47,000
YP in Perp @ 5.5%	<u>18.18</u>
Capital Required	<u>854,460</u>

(v) Sensitivity to all changes (10% fall in revenue, 6% rise in GST and 10 % increase in yield

	MYR
Gross Revenue	45,000
Less GST @ 6.36%	<u>2,862</u>
Net Operating Income	42,638
YP in Perp @ 5.5%	<u>18.18</u>
Capital Required	<u>775,159</u>

Note: The scenarios can change and the capital is recalculated. Where there are many predicting variables (factors) that affects the dependent variable (Capital), it will be less stressful to analysis and estimate the different scenarios using a computer application.

4.5 Scenario Analysis

Scenario Analysis evaluates the expected value of a proposed investment or business activity. The statistical mean is the highest probability event expected in a certain situation. By creating various scenarios that may occur and combining them with the probability that they will occur, an analyst can better determine the value of an investment or business venture, and the probability that the expected value calculated will actually occur. Historical performance data is required to provide some insight into the variability of an investment's performance and to help investors understand the risk that is inherent in their investment in the past. By examining periodic return data, an investor can gain insight into an investment's past risk. An investment that provided the same return every year is deemed to be less risky

than an investment that provided annual returns that fluctuated between negative and positive. Scenario analysis attempts to understand a venture's potential risk/return profile through deep analysis of multiple pro-forma estimates for a given venture/project and denoting a probability for each scenario.

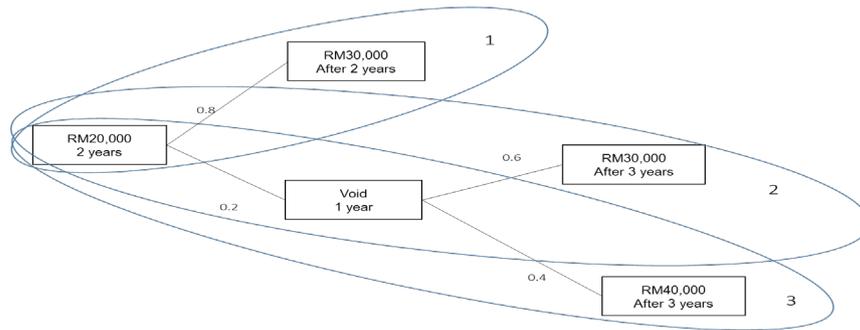
The process involve estimating the expected value of a portfolio after a given period of time, assuming specific changes in the values of the portfolio's securities or key factors that would affect security values, such as changes in the interest rate. The common focus of scenario analysis is the estimation of potential changes in portfolio's value in a situation of an unfavourable event, or the "worst-case scenario", leading computation of different value of investment and expected returns in an investment life. There are many different ways to approach scenario analysis, but a common method is to determine risk of returns are, and then compute what value would be expected for the portfolio if each security generated returns two or three risk levels above and below the average return. This will make the investment manager/analyst have an assurance that the value of a portfolio is unlikely to go below/above a pre-determined specific level of value in a specific time period. The simplest method to forecast potential outcomes of an investment or venture is to produce an upside and downside case for each outcome and then to speculate the probability that it will occur.

Exercise

An investment is certain of yielding an annual income of MYR20,000 for the next 2 years. The market analysis presents 80% chance of increased income to MYR30,000 after the initial term of 2 years and 20% chance of a void (no income) for one year after which the income can rise to MYR30,000 or MYR40,000. The probability of the rise in income after a year of void is 60% MYR30,000 and 40% MYR40,000. Adopting an expected 8% , Estimate the maximum amount to be invested.

Estimates

First, draw out the scenarios in a Decision Tree format to reflect the possible probabilities



Scenario 1

Term 2 years

	MYR	MYR	
Income	20,000		
YP @ 8% for 2 years	<u>1.7833</u>		35,666
 <u>Reversion</u>			
Income	30,000		
YP in perp @ 8% differed 2 years	<u>10.7167</u>		<u>321,502</u>
Capital to be invested		<u>357,168</u>	

Scenario 2

Term 2 years

	MYR	MYR	
Income	20,000		
YP @ 8% for 2 years	<u>1.7833</u>		35,666
 <u>Reversion</u>			
Income	30,000		
YP in perp @ 8% differed 3 years	9.9229		<u>297,687</u>
Capital to be invested		<u>333,353</u>	

Scenario 3

Term 2 years

	MYR	MYR	
Income	20,000		
YP @ 8% for 2 years	<u>1.7833</u>		35,666
 <u>Reversion</u>			
Income	40,000		
YP in perp @ 8% differed 3 years	<u>9.9229</u>		<u>396,916</u>
Capital to be invested		<u>432,582</u>	

The probability of each scenario will now be applied and the final figure summed up.

		MYR
Scenario 1: 80% reversionary income	0.8 x 357,168	285,734.40
Scenario 2: 20%void and 60% reversionary income	0.2 x 0.6 x 333,353	40,002.36
Scenario 3: 20%void and 40% reversionary income	0.2 x 0.4 x 432,582	51,909.84
Investment Capital		<u>377,646.60</u>

4.6 Monte Carlos Simulation (MCS)

MCS is a technique that converts uncertainties in input variables of a model into probability distributions. By combining the distributions and randomly selecting values from them, it recalculates the simulated model many times and brings out the probability of the output. MCS is one technique that helps to reduce the uncertainty involved in estimating future outcomes. MCS can be applied to complex, non-linear models or used to evaluate the accuracy and performance of other models. It can also be implemented in risk management, portfolio management, pricing derivatives, strategic planning, project planning, cost modelling and other fields.

MCS allows several inputs to be used at the same time to create the probability distribution of one or more outputs. Different types of probability distributions can be assigned to the inputs of the model. When the distribution is unknown, the one that represents the best fit could be chosen. The use of random numbers characterizes MCS as a stochastic method. The random numbers have to be independent;

MCS generates the output as a range instead of a fixed value and shows how likely the output value is to occur in the range.

Let the real-valued function $g(X)$ with probability frequency function $P(x)$ for discrete X , or probability density function $f(x)$ for continuous X . Therefore, expected value of $g(X)$ in discrete and continuous terms respectively is:

$$E(g(X)) = \sum_{-\infty}^{+\infty} g(x)P(x) , \text{ where } P(x) > 0 \text{ and } \sum_{-\infty}^{+\infty} P(x) = 1$$

$$E(g(X)) = \int_{-\infty}^{+\infty} g(x)f(x)dx , \text{ where } f(x) > 0 \text{ and } \int_{-\infty}^{+\infty} f(x)dx = 1$$

For n random drawings of $X (x_1, \dots, x_n)$, to calculate $g(x_1), \dots, g(x_n)$ and find the mean of $g(x)$ of the sample:

$$\bar{g}_n(x) = \frac{1}{n} \sum_{i=1}^n g(x_i), \text{ which represents the final simulated value of } E(g(X)).$$

$$\text{Therefore } \bar{g}_n(X) = \frac{1}{n} \sum_{i=1}^n g(X) \text{ will be the Monte Carlo estimator of } E(g(X)).$$

As $n \rightarrow \infty$, $\bar{g}_n(X) \rightarrow E(g(X))$, thus we are now able to compute the dispersion around the estimated mean with the unbiased variance of $\bar{g}_n(X)$:

$$\text{Var}(\bar{g}_n(X)) = \frac{1}{n} \frac{1}{n-1} \sum_{i=1}^n (g(x_i) - \bar{g}_n(x))^2.$$

4.7 Advantages of Risk Analysis

Assessing risk at the project, portfolio, and business levels helps the investor/manager to understand risk, make better decisions, negotiate fair contracts, create risk mitigation scenarios, and improve performance. Analysing the risk facing a group of projects leads to a better overall view of risk to the portfolio. Looking at the entire portfolio enables individual projects to be compared and understood in terms of their risk. This helps in selection of projects and focusing of management attention on the projects that most need it.

Projects/investments in a portfolio often have interdependencies, shared resources, and shared goals. In risk assessment, they need not be considered in isolation. At the portfolio level, it is important to express risk arising from project interdependency. Risk at the portfolio level can be shared and balanced across projects as a way of mitigating it. In summary, risk assessment enables you to better understand and manage the portfolio as a whole. You can use the whole weight of the portfolio to manage the risk.

The benefits of risk assessment extend beyond a single project. Projects within a portfolio can be understood in terms of their interdependencies, shared resources, and ultimate goals. Projects can also be prioritized according to their risk level so risk can be balanced and managed across the portfolio. By understanding risk to both individual projects and portfolios, management will be able to make better strategic decisions. Cost commitments, revenue pipelines, and profit forecasts will be accurately stated for each level of risk. The sensitivity of the forecasts will be better understood. When informed by the risk assessment, the entire business will be more profitable. The objective of the risk assessment is geared toward answering three risk questions:

- What can go wrong?

- How likely is that to happen?
- What would be the consequences if it did go wrong?

Risk assessment provides structured information that allows decision makers to identify interventions that can lead to public health improvement or to avoid future problems. Investors are able to gain valuable insights through a detailed and holistic risk analysis of their portfolios, so they are in a position to make better investment decisions and take advantage of market opportunities.

Exercise 4

1. What is investment risk?
2. What is investment return?
3. Define forecasting. What are assumptions in forecasting?
4. Explain Sensitivity Analysis and Scenario Analysis.
5. What is Monte Carlo Simulation?
6. Share your understanding of advantages of risk analysis?

5.0 REAL ESTATE INVESTMENT TRUST (REIT)

REIT is likened to a company that is quoted on the stock exchange but its core business is the ownership, purchase, sale and development of real estate. In other words, REITs are often referred to as property companies whose shares are publicly traded on the secondary market. The difference between an investment trust and a quoted company, however, is that the former must distribute a larger percentage of its profits to shareholders, and in return for distributing 90 percent of their annual profits as dividend to shareholders.

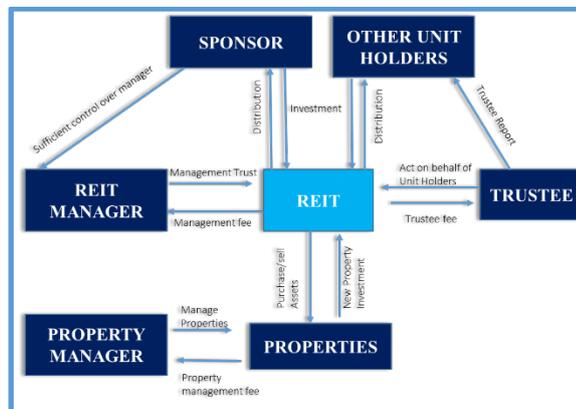
Corgel et al. (1995) defined REIT as “investment tool to create flow of funds from investors to the real estate and property sector of the country. REIT is a company or a trust that pools fund from individual investors, acquires and operates income generating real estate, and distributes the income derived from their owned properties as dividend. Initially, REIT tendered to be similar to mutual funds allowing investors to pool capital and invest in diversified pools of real estate that are regarded as passive investments. REIT has attributes of both stock and bond and it is thus regarded as a hybrid of stocks and bonds (Ong et al., 2011). REIT typically offers investors high yield, receive special tax consideration and presents a highly liquid method of investing in real estate (Chin et al., 2007). Individuals can invest in REIT either by purchasing their shares directly in an open exchange or by investing in a mutual fund that specializes in public real estate. An individual benefit to investing in REITs is the fact that many are accompanied by dividend re-investment plan (DRIP). Among other things, REITs invest in shopping malls, office buildings, apartments, hospitals, warehouses and hotels properties. Some REITs will invest specifically in one area of real estate e.g. shopping mall or in one specific region, state or country while other REITs do diversify among property types or across regions.

Under the United States Federal Income Tax Law, a REIT is any corporation, trust or association that acts as an investment agent specializing in real estate and real estate mortgages. A REIT is entitled to deduct dividend paid to its owners (shareholders) before tax and therefore avoid incurring all or part of its liabilities for the U.S. Federal Income Tax, this is meant to avoid double taxation. REITs by law are required to distribute at least 90% of their taxable income as dividend unto the hands of the investors. From the foregoing, a

REIT is a company that owns, and in most cases, operates different types of income producing real estates, ranging from offices to warehouses, hospitals, shopping centres, hotels, timberlands and apartments. Some REITs (hybrid or mortgage) engage in financing real estate though indirectly. However, the REIT structure is originally designed to provide a real estate investment structure similar to the structure of mutual funds to provide for investment in stocks (Cummings, 2008).

The common features in the definitions for REIT are

- i. A registered company, association, trust or corporation
- ii. Investment in income yielding real estate properties, and or real estate mortgage
- iii. Generate revenue from real estate properties
- iv. Distribution of revenue before tax to investors in form of dividend



Typical structure of externally managed REIT
 Source: Lecomte and OOi (2012) in Moss and Prima (2014)

5.1 Investment Return Performance

Choosing investments is just the beginning of your work as an investor. As time goes by, the need to monitor the performance of these investments to see how they are working together in the portfolio to help the investor progress toward investment goals. Generally speaking, progress means that the portfolio value is steadily increasing, even though one or more of the investments may have lost value.

If assets/investments are not showing any gains or investment account value is slipping, there will be need to determine why, and decide on the next move. In addition, because investment markets change all the time, investors will want to be alert to opportunities to improve their portfolio's performance, perhaps by diversifying into a different sector

of the economy or allocating part of their portfolio to international investments. To free up money to make these new purchases, the investor may want to sell individual investments that have not performed well, while not abandoning the asset allocation that have been selected as appropriate.

In measuring investment performance, Analysts want to be sure to avoid comparing apples to oranges. Finding and applying the right evaluation standards for investments is important to avoid ending up drawing the wrong conclusions. For example, there's little reason to compare yield from a growth mutual fund with yield from a Treasury bond, since they do not fulfil the same role in your portfolio. Instead, a measure performance for a growth fund should be against standards of other growth investments, such as a growth mutual fund index or an appropriate market index. Here are some concepts to consider when evaluating the performance of investments including yield, rate of return and capital gains and losses.

Return is all of the money make or lose on an investment. To find your **total return**, generally considered the most accurate measure of return, the change in value—up or down—from the time of purchase of the investment is added to all of the income collected from that investment in interest or dividends. To find **percent return**, return is divided by the amount invested.

(Change in value + Income) ÷ Investment amount = Percent return

For example, suppose you invested SAR2,000 to buy 100 shares of a stock at SAR20 a share. While you own it, the price increases to SAR25 a share and the company pays a total of SAR120 in dividends. To find your total return, you'd add the SAR500 increase in value to the SAR120 in dividends, and to find percent return you divide by SAR2,000, for a result of 31 percent (31%).

That figure by itself doesn't give the whole picture, though. Since investments could be held for different periods of time, the best way to compare their performance is by looking at their annualized percent return. Therefore, for SAR620 total return on a SAR2,000 investment over three years which is 31%, the annualized return is 9.42%. This is derived by doing the following calculation:

$$(1 + 0.31)^{\frac{1}{3}} - 1 = 9.42\%$$

The standard formula for computing annualized return is

$$AR = (1 + \text{return})^{\frac{1}{\text{years}}} - 1$$

The rate of return performance of a REIT is not the most important but the reliability of the performance in absolute term to a chosen averages called indices. The relevant index or benchmark is the key issue of interest to assess investment return. Selection of appropriate index or benchmark is therefore an important task in order to offer an evidence of abnormal performance (if any). A benchmark need to be representative of the asset class it measures .A well-known index is the ‘Standard and Poor 500’ (S&P 500) which represents the universe of U.S. large-cap stocks. Other commonly-used indices are the U.S. Dow Jones Industrial Average (DJIA) and Russell 2000, the British FTSE 100, the Japanese Nikkei 225, the German DAX, etc. For example, to evaluate the past performance of a portfolio of U.S. large-cap stocks, we may be interested in comparing its total return with that of the S&P 500 during the same period of time, conclude of an out-performance or an under-performance accordingly.

This practice of comparing against a reference is frequently called *benchmarking*. A *benchmark* is a point of reference — the word originates from the practice of land surveying but it is nowadays used in many fields. A clear understanding of the nature of samples that created an index is essentially important, be it All Share Index (ASI), FBMKLCI or American S&P500 or FBMKLCI30. Parker (2011) illustrated with UK-IPD index which is based on institutional grade commercial real estate of about 11,000 samples in the UK. He warned that the sample may not create an index for the entire UK commercial property market because the sample did not include all properties in the market. Such an index is not indicative of the entire real estate market as the sample was defined to represent institutional grade commercial properties in UK (Geltner et al., 2007).

5.2 Forecasting

Forecasting is the process of making predictions of the future based on past and present data and analysis of trends. A commonplace example might be estimation of some variable of interest at some specified future date. Forecasting is used by investors/companies to determine how to allocate their fund/budget for an upcoming period of time. This is typically based on investment past performance or in case of companies based on demand for the goods and services it offers, compared to the cost invested. Investors utilize forecasting to determine if events affecting a company, such as sales expectations, will increase or decrease the price of shares in that company.

Forecasting also provides an important benchmark for firms which have a long-term perspective of operations.

Forecasting can be broadly considered as a method or a technique for estimating many future aspects of a business or other operation. Indeed, their typically modest capital resources make such planning particularly important. In fact, the long-term success of both small and large organizations is closely tied to how well the management of the organization is able to foresee its future and to develop appropriate strategies to deal with likely future scenarios. Intuition, good judgment, and an awareness of how well the industry and national economy are doing may give the manager of a business firm a sense of future market and economic trends. Nevertheless, it is not easy to convert a feeling about the future into a precise and useful number, such as next year's sales volume or the raw material cost per unit of output. Forecasting methods can help estimate many such future aspects of a business operation. The goal of forecasting is to come as close as possible to an accurate picture of the future. But, as with other forms of fortune telling, it is never fully accurate.

The assumptions behind forecasting and the methods were mentioned in section 5.1 of this lecture notes.

Exercise 5

1. Please define Real Estate Investment Trust (REIT)
2. What are the criteria of REIT?
3. How to calculate investment return?
4. What is the formula for annualised return?
5. What is forecasting?