Real estate is "Property consisting of land and the buildings on it, along with its natural resources such as crops, minerals, or water; immovable property of this nature; an interest vested in this; (also) an item of real property; (more generally) buildings or housing in general. Also: the business of real estate; the profession of buying, selling, or renting land, buildings or housing."

Property is any physical or intangible entity that is owned by a person or jointly by a group of people or a legal entity like a corporation. Depending on the nature of the property, an owner of property has the right to consume, sell, rent, mortgage, transfer, exchange or destroy it, or to exclude others from doing these things.

Important widely recognized types of property include real property (the combination of land and any improvements to or on the land), personal property (physical possessions belonging to a person), private property (property owned by legal persons or business entities), public property (state owned or publicly owned and available possessions) and intellectual property (exclusive rights over artistic creations, inventions, etc.), although the latter is not always as widely recognized or enforced. A title, or a right of ownership, establishes the relation between the property and other persons, assuring the owner the right to dispose of the property as the owner sees fit.

Public property is any property that is controlled by a state or by a whole community. Private property is any property that is not public property. Private property may be under the control of a single person or by a group of persons jointly.

Ownership

Ownership laws may vary widely among countries depending on the nature of the property of interest (e.g. firearms, real property, personal property, animals). Persons can own property directly. In most society's legal entities, such as corporations, trusts and nations (or governments) own property.

In many countries women have limited access to property following restrictive inheritance and family laws, under which only men have actual or formal rights to own property. However in Nigeria, Ownership rights on Real property is endorse with two main interests: Freehold and leasehold interest.

Freehold Interest: the right of ownership of land in this respect is in absolute terms. In legal parlance it said to be "fee simple" which means that the land is held in perpetuity by the owner or his heir until interest is divested by sale or transferred by valid will to someone not his heir. Among the rights are to sell, to give away as gift, to create lesser interest-(leasehold), to mortgage, etc. Even when he lets he land out or grants a lease, he reserves a "freehold reversion" that is the land will be revert to him on the expiration of the lease period. It is the most superior interest.

Leasehold Interest: on the other hand a lease title is said to be in "term of years absolute" which is also "fee tail" which means a temporary interest in the landed property. Leasehold is tenant,

"tenant for a term of years". In other words, a leasehold estate does not carry an interest in the land in perpetuity. It is merely a lease of the land against payment of a rent termed "ground rent" for a fixed term of years or for a term, which is limited to come to an end at or before some fixed date.

Real estate economics

Real estate economics is the application of economic techniques to real estate markets. It tries to describe, explain, and predict patterns of prices, supply, and demand. The closely related fields of **housing economics** is narrower in scope, concentrating on residential real estate markets as does the research of **real estate trends** focus on the business and structural changes impacting the industry. Both draw on partial equilibrium analysis (supply and demand), urban economics, spatial economics, extensive research, surveys and finance.

Overview of real estate markets

The main participants in real estate markets are:

- **Owner/User** - These people are both owners as well as tenants. They purchase houses or commercial property as an investment and also to live in or utilize as a business.
- **Owner** - These people are pure investors. They do not consume the real estate that they purchase. Typically they rent out or lease the property to someone else.
- **Renter** - These people are pure consumers.
- **Developers** - These people prepare raw land for building which results in new product for the market.
- **Renovators** - These people supply refurbished buildings to the market.
- **Facilitators** - This includes banks, Real Estate Brokers lawyers, and others that facilitate the purchase and sale of real estate.

The owner/user, owner, and renter comprise the demand side of the market, while the developers and renovators comprise the supply side. In order to apply simple supply and demand analysis to real estate markets a number of modifications need to be made to standard microeconomic assumptions and procedures. In particular, the unique characteristics of the real estate market must be accommodated. These characteristics include:

- **Durability** - Real estate is durable. A building can last for decades or even centuries, and the land underneath it is practically indestructible. Because of this, real estate markets are modeled as a stock/flow market. About 98% of supply consists of the stock of existing houses, while about 2% consists of the flow of new development.
- **Heterogeneous** - Every piece of real estate is unique, in terms of its location, in terms of the building, and in terms of its financing. This makes pricing difficult, increases search costs, creates information asymmetry and greatly restricts substitutability.
- **High Transaction costs** - Buying and/or moving into a home costs much more than most types of transactions. These costs include search costs, real estate fees, moving costs, legal fees, land transfer taxes, and deed registration fees. Transaction costs for the seller typically range between 1.5 - 6% of the purchase price.

- **Long time delays** - The market adjustment process is subject to time delays due to the length of time it takes to finance, design, and construct new supply, and also due to the relatively slow rate of change of demand. Because of these lags there is a great potential for disequilibrium in the short run. Adjustment mechanisms tend to be slow, relative to more fluid markets.
- **Both an investment good and a consumption good** - Real estate can be purchased with the expectation of attaining a return (an investment good), or with the intention of using it (a consumption good), or both. These functions can be separated (with market participants concentrating on one or the other function) or can be combined (in the case of the person that lives in a house that they own). This dual nature of the good means that it is not uncommon for people to over-invest in real estate, that is, to invest more money in an asset than it is worth on the open market.
- Immobility - Real estate is locationally immobile (save for mobile homes, but the land underneath them is still immobile). Consumers come to the good rather than the good going to the consumer. Because of this, there can be no physical market-place.

Demand for housing

The main determinants of the demand for housing are demographic. However other factors like income,

Price of housing,

Cost and availability of credit,

Consumer preferences,

Investor preferences,

Price of substitutes and price of complements all play a role.

The core demographic variables are population size and population growth: the more people in the economy, the greater the demand for housing. But this is an oversimplification. It is necessary to consider family size, the age composition of the family, the number of first and second children, net migration (immigration minus emigration), non-family household formation, and the number of double family households, death rates, divorce rates, and marriages.

Income is also an important determinant. Transitory income varies from year-to-year and across individuals so positive transitory income will tend to cancel out negative transitory income. Many housing economists use permanent income rather than annual income because of the high cost of purchasing real estate. For many people, real estate will be the most costly item they will ever buy.

The price of housing is also an important factor.

UTILITY

An individual household's housing demand can be modeled with standard utility/choice theory. A utility function, such as U=U(X1,X2,X3,X4,...Xn), can be constructed in which the households utility is a function of various goods and services (Xs). This will be subject to a budget constraint such as P1X1+P2X2+...PnXn=Y, where Y is the households available income and the Ps are the prices for the various goods and services. The equality indicates that the money spent on all the goods and services must be equal to the available income. Because this is unrealistic, the model must be adjusted to allow for borrowing and/or saving. A measure of wealth, lifetime income, or permanent income is required. The model must also be adjusted to account for the heterogeneousness of real estate. This can be done by deconstructing the utility function. If housing services (X4) is separated into the components that comprise it (Z1,Z2,Z3,Z4,...Zn), then the utility function can be rewritten as U=U(X1,X2,X3,(Z1,Z2,Z3,Z4,...Zn)...Xn) By varying the price of housing services (X4) and solving for points of optimal utility, that household's demand schedule for housing services can be constructed. Market demand is calculated by summing all individual household demands.

Supply of housing

Housing supply is produced using land, labor, and various inputs such as electricity and building materials. The quantity of new supply is determined by the cost of these inputs, the price of the existing stock of houses, and the technology of production. A production function such as Q=f(L,N,M) can be constructed in which Q is the quantity of houses produced, N is the amount of labour employed, L is the amount of land used, and M is the amount of other materials. This production function must, however, be adjusted to account for the refurbishing and augmentation of existing buildings. To do this a second production function is constructed that includes the stock of existing housing, and their ages, as determinants. The two functions are summed yielding the total production function.

ANALYSIS OF REAL ESTTE MARKETS

Market analysis is the study of a specific market. It is the collection and dissection of data and the conversion of that data to information that can be used for analysis and decision-making by an appraiser or analyst.

■ **TYPES OF MARKET ANALYSIS**

The following three types of market analysis are available:

1. Market study
2. Marketability study
3. Feasibility study

All are performed by appraisers either separately or as part of a complete appraisal.

Market Study

A **market study** is the analysis of an environment of buyers/sellers and/or landlords/tenants (lessors/lessees). A market study is not site specific. It usually relates to a certain property type or geographic area.

Marketability Study

A **marketability study** relates to a more specific product type within a defined market.

A marketability study often addresses the time required to absorb a particular product, and the price or rent level at which that product would be accepted into the marketplace. A marketability study is usually both site specific and property type specific. However, the appraiser usually begins with a broad market, then reduces this down to an individual submarket.

A **feasibility study** is simply a comparison of cost versus the value if the project is undertaken. If cost exceeds the value, the proposal is not feasible. If the value exceeds cost, the proposal is feasible.
A feasibility study is of course property type as well as site specific.

■ TYPES AND SOURCES OF DATA

When proceeding through the data collection process, the appraiser should be aware of how to categorize all the information obtained. One general means is to classify the data by type and by source.

Types of Data

1. *General Data*—General data relates to collected information that would be appropriate for many properties. General data usually encompasses all of the four forces (social, economic, environmental/physical, and governmental).

A demographic printout from a demographic service is an example of general data.

Other examples of general data include labor statistics, weather studies, transportation studies, etc.
2. *Specific Data*—This relates to information that is used directly in the analysis of the subject property. Specific data thus relates to the subject property itself as well as the comparables that will be used in the actual valuation process.
For example, information on the subject itself would include site data such as legal description, survey, environmental report, etc. Information on the comparables may include data related to land sales similar to the subject site, sales of improved properties with improvements similar to the subject, and comparable rentals

Sources of Data

1. *Secondary Data*—Secondary data encompasses publications and other sources of information that were prepared by someone other than the appraiser. Sources of secondary data may include chamber of commerce publications, census reports, rent studies, published sales data services, etc.
2. *Primary Data*—Primary data relates to information that was collected directly by the appraiser. Examples of primary data may include a sketch prepared by the appraiser based on actual building measurements, subject photographs, sales information procured directly by the appraiser, area rentals obtained directly by the appraiser, etc.
In the course of performing an appraisal, an appraiser usually starts with a variety of secondary data sources, then chooses the items that must be verified and/or inspected directly by the appraiser. When this step occurs, primary data may be produced from the secondary data source.

STEPS IN MARKET ANALYSIS

Market analysis includes an evaluation of the market boundaries and then of its supply and demand for one or more products.

Market Boundaries

Identifying the market area is the first step in market analysis. Although the boundaries may be more clearly defined by social, economic, or governmental factors, the **market boundaries** are usually identified by some geographical (physical/environmental) means. Geographical boundaries may include streets, rivers, lakes, rail lines, etc. Establishing boundaries does not necessarily mean that the appraiser cannot go outside the boundaries for appropriate data.

Forces outside the subject site boundaries are called external forces or external economies, and thus, could include the market area, but would be outside the subject site itself.

In other instances, neighborhood boundaries may be more readily identifiable by linkages.

Supply

The existing inventory represents the most easily identifiable component of **supply**. There are other more subtle indications of supply, however, that must also be analyzed. Properties under construction, properties planned, or properties that are capable of being converted all represent supply alternatives. A study of housing permits in a certain geographic area could be a very valuable indicator of what the inventory may be several months hence. Most major developments such as office buildings, shopping centers, or industrial parks become known through public announcements.

Demand

Demand relates to occupancy and absorption of a particular product in the defined area. Occupancy is the count of the units that are physically occupied as of a certain period while absorption is best described as the change (positive or negative) of occupied units over a specified period of time.

In performing a demand analysis, the appraiser usually starts with a broad market, then continually condenses the analysis into a smaller, well-defined area.

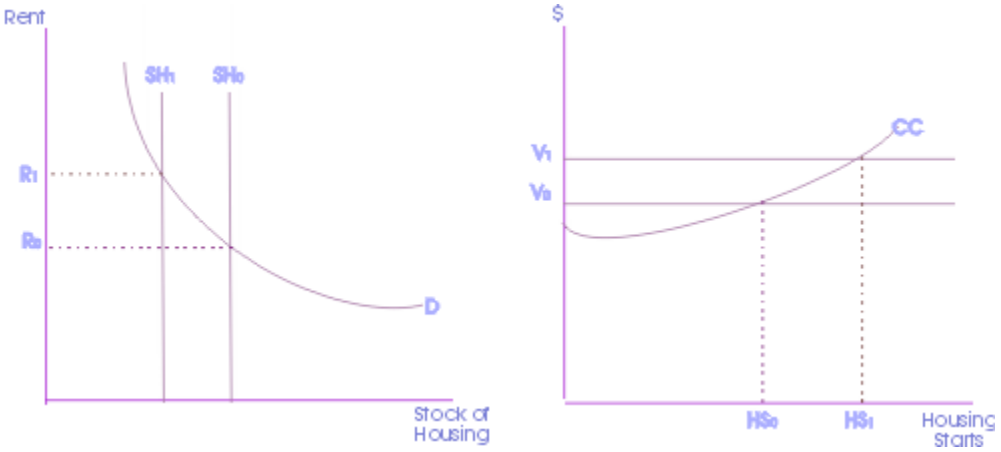
Elasticity of the market

Price elasticity of supply

The long-run price elasticity of supply is quite high. But in the short run supply tends to be very price inelastic. Supply price elasticity depends on the elasticity of substitution and supply restrictions. There is significant substitutability both between land and materials, and between labour and materials. In high-value locations, multi-story concrete buildings are typically built to reduce the amount of expensive land used. As labour costs increased since the 1950s, new materials and capital intensive techniques have been employed to reduce the amount of relatively expensive labour used. However supply restrictions can significantly affect substitutability. In particular the lack of supply of skilled labour (and labour union requirements), can constrain the substitution from capital to labour. Land availability can also constrain substitutability if the area of interest is delineated (that is, the larger the area, the more suppliers of land, and the more

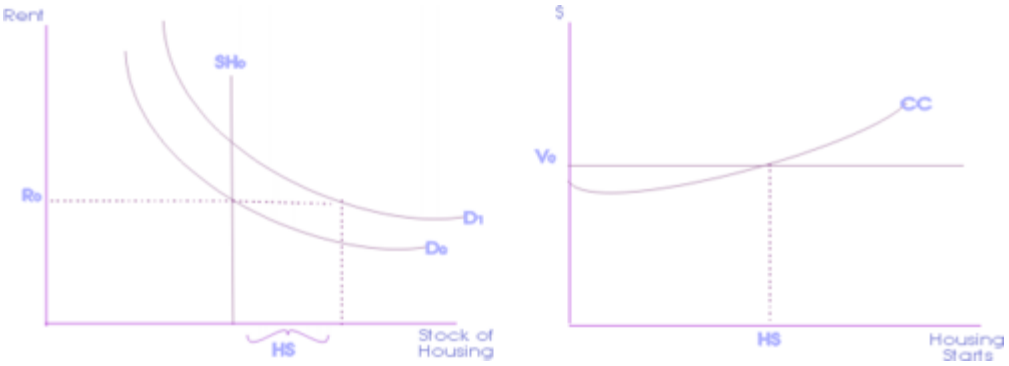
substitution that is possible). Land use controls such as zoning bylaws can also reduce land substitutability.

Adjustment with depreciation



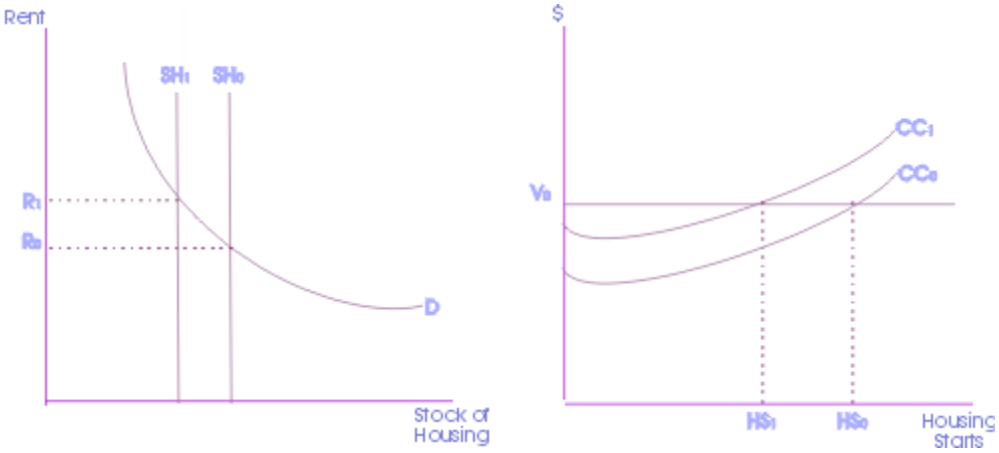
The diagram to the right shows the effects of depreciation. If the supply of existing housing deteriorates due to wear, then the stock of housing supply depreciates. Because of this, the supply of housing (**SHo**) will shift to the left (to **SH1**) resulting in a new equilibrium demand of **R1** (since the amount of homes decreased, but demand still exists). The increase of demand from **Ro** to **R1** will shift the value function up (from **Vo** to **V1**). As a result, more houses can be produced profitably and housing starts will increase (from **HSo** to **HS1**). Then the supply of housing will shift back to its initial position (**SH1** to **SHo**).

Increase in demand



The diagram on the right shows the effects of an increase in demand in the short run. If there is an increase in the demand for housing, such as the shift from **Do** to **D1** there will be either a price or quantity adjustment, or both. For the price to stay the same, the supply of housing must increase. That is, supply **SHo** must increase by **HS**.

Increase in costs



The diagram on the right shows the effects of an increase in costs in the short-run. If construction costs increase (say from **CCo** to **CC1**), developers will find their business less profitable and will be more selective in their ventures. In addition some developers may leave the industry. The quantity of housing starts will decrease (**HSo** to **HS1**). This will eventually reduce the level of supply (from **SHo** to **SH1**) as the existing stock of housing depreciates. Prices will tend to rise (from **Ro** to **R1**).

Mortgages in real estate

The lack of effective real estate laws can be a significant barrier to investment in many developing countries. In most societies, rich and poor, a significant fraction of the total wealth is in the form of land and buildings.

In most advanced economies, the main source of capital used by individuals and small companies to purchase and improve land and buildings is mortgage loans (or other instruments). These are loans for which the real property itself constitutes collateral. Banks are willing to make such loans at favorable rates in large part because, if the borrower does not make payments, the lender can foreclose by filing a court action which allows them to take back the property and sell it to get their money back.

But in many developing countries there is no effective means by which a lender could foreclose, so the mortgage loan industry, as such, either does not exist at all or is only available to members of privileged social classes.

Real estate financing

There are different ways of real estate financing: governmental and commercial sources and institutions. A home buyer or builder can obtain financial aid from savings and loan associations, commercial banks, savings banks, mortgage bankers and brokers, life insurance companies, credit unions, federal agencies, individual investors, and builders.

Savings and loan associations

The most important purpose of these institutions is to make mortgage loans on residential property. These organizations, which also are known as savings associations, building and loan associations and cooperative banks

Some of the most important characteristics of a savings and loan association are[1]:

1. It is generally a locally owned and privately managed home-financing institution.
2. It receives individuals' savings and uses these funds to make long-term amortized loans to home purchasers.
3. It makes loans for the construction, purchase, repair, or refinancing of houses.
4. It is state or federally chartered.

Commercial banks

Due to changes in banking laws and policies, commercial banks are increasingly active in home financing. In acquiring mortgages on real estate, these institutions follow two main practices[1]:

1. First, some of the banks maintain active and well-organized departments whose primary function is to compete actively for real estate loans. In areas lacking specialized real estate financial institutions, these banks become the source for residential and farm mortgage loans.
2. Second, the banks acquire mortgages by simply purchasing them from mortgage bankers or dealers.

In addition, dealer service companies, which were originally used to obtain car loans for permanent lenders such as commercial banks, wanted to broaden their activity beyond their local area. In recent years, however, such companies have concentrated on acquiring mobile home loans in volume for both commercial banks and savings and loan associations. Service companies obtain these loans from retail dealers, usually on a nonrecourse basis. Almost all bank/service company agreements contain a credit insurance policy that protects the lender if the consumer defaults.

Savings banks

These depository financial institutions are federally chartered, primarily accept consumer deposits, and make home mortgage loans.

Mortgage bankers and brokers

Mortgage bankers are companies or individuals, who originate mortgage loans, sell them to other investors, service the monthly payments, and may act as agents to dispense funds for taxes and insurance.

Mortgage brokers present the consumer home buyer with the best loan from a variety of loan sources. Their income comes from the lender making the loan, just like with any other bank. Because they can tap a variety of lenders, they can shop on behalf of the borrower and achieve

the best available terms. Despite legislation enacted that could favor the major banks, mortgage bankers and brokers keep the market competitive so the largest lenders must continue to compete on price and service. According to Don Burnette of Brightgreen Homeloans in Port Orange, Florida, "The mortgage banker and broker conduit is vital to maintain competitive balance in the mortgage industry. Without it, the largest lenders would be able to unduly influence rates and pricing, potentially hurting the consumer. Competition drives every organization in this industry to constantly improve on their performance, and the consumer is the winner in this scenario." [1]

Life insurance companies

Life insurance companies are another source of financial assistance. These companies lend on real estate as one form of investment and adjust their portfolios from time to time to reflect changing economic conditions. Individuals seeking a loan from an insurance company can deal directly with a local branch office or with a local real estate broker who acts as loan correspondent for one or more insurance companies.

Credit unions

These cooperative financial institutions are organized by people who share a common bond — for example, employees of a company, a labor union, or a religious group. Some credit unions offer home loans in addition to other financial services.[1]

Federally supported agencies

Under certain conditions and fund limitations the Veterans Administration makes direct loans to creditworthy veterans in housing credit shortage areas designated by the VA's administrator. Such areas are generally rural areas and small cities and towns not near the metropolitan or commuting areas of large cities — areas where GI loans from private institutions are not available.

The federally supported agencies referred to here do not include the so-called second-layer lenders who enter the scene after the mortgage is arranged between the lending institution and the individual home buyer.[1]

Real Estate Valuation

Property valuation or land valuation is the process of valuing real property. The value usually sought is the property's Market Value. Appraisals are needed because compared to, say, corporate stock, real estate transactions occur very infrequently. Not only that, but every property is different from the next, a factor that doesn't affect assets like corporate stock. Furthermore, all properties differ from each other in their location - which is an important factor in their value.This product differentiation and lack of frequent trading, unlike stocks, means that specialist qualified appraisers are needed to advise on the value of a property. The appraiser usually provides a written report on this value to his or her client. These reports are used as the basis for mortgage loans, for settling estates and divorces, for tax matters, and so on. Sometimes the appraisal report is used by both parties to set the sale price of the property appraised.In some areas, an appraiser doesn't need a license or any certification to appraise property.

Types of value

There are several types and definitions of value sought by a real estate appraisal. Some of the most common are:

- **Market value** – The price at which an asset would trade in a competitive Walrasian auction setting. Market value is usually interchangeable with *open market value* or *fair value*. International Valuation Standards (IVS) define:

  Market value - the estimated amount for which an asset or liability should exchange on the *valuation date* between a willing buyer and a willing seller in an arm's length transaction, after proper marketing and where the parties had each acted knowledgeably, prudently and without compulsion.

- **Value-in-use**, or **use value** – The net present value (NPV) of a cash flow that an asset generates for a specific owner under a specific use. Value-in-use is the value to one particular user, and may be above or below the market value of a property.

- **Investment value** - is the value to one particular investor, and may or may not be higher than the market value of a property. Differences between the *investment value* of an asset and its *market value* provide the motivation for buyers or sellers to enter the marketplace. International Valuation Standards (IVS) define:

  Investment value - the value of an asset to the owner or a prospective owner for individual investment or operational objectives.

- **Insurable value** - is the value of real property covered by an insurance policy. Generally it does not include the site value.

- **Liquidation value** - may be analyzed as either a **forced liquidation** or an **orderly liquidation** and is a commonly sought standard of value in bankruptcy proceedings. It assumes a seller who is compelled to sell after an exposure period which is less than the market-normal time-frame.

Three approaches to value

There are three general groups of methodologies for determining value. These are usually referred to as the "three approaches to value" which are generally independent of each other:

- The cost approach
- The sales comparison approach and
- The income approach

The cost approach

The **cost approach** was formerly called the summation approach. The theory is that the value of a property can be estimated by summing the land value and the depreciated value of any improvements. The value of the improvements is often referred to by the abbreviation RCNLD (reproduction cost new less depreciation or replacement cost new less depreciation). Reproduction refers to reproducing an exact replica. Replacement cost refers to the cost of building a house or other improvement which has the same utility, but using modern design, workmanship and materials. In practice, appraisers almost always use replacement cost and then deduct a factor for any functional dis-utility associated with the age of the subject property. An exception to the general rule of using the replacement cost is for some insurance value appraisals. In those cases, reproduction of the exact asset after the destructive event (fire, etc.) is the goal.

In most instances when the cost approach is involved, the overall methodology is a hybrid of the cost and sales comparison approaches. For example, the replacement cost to construct a building can be determined by adding the labor, material, and other costs. On the other hand, land values and depreciation must be derived from an analysis of comparable sales data.

The cost approach is considered most reliable when used on newer structures, but the method tends to become less reliable for older properties. The cost approach is often the only reliable approach when dealing with special use properties (e.g., public assembly, marinas).

Property Valuation Appraisal and Investment Techniques – Cost Method

In this valuation method, the value of property is valued based on the cost of acquiring the same property. There are some steps in this property valuation method.

Step 1: Estimate the cost of acquiring empty land which is same with property in valuation.

Step 2: Estimate the cost of constructing new building which is same with property in valuation.

Step 3: Estimate the depreciation of physical features for property in valuation. For example, roof for newly built building will last longer than old property which is in valuation.

Below is practical evaluation example:

Features	Cost ($)	Value (#)
Land valuation		30,000
New building valuation		+ 60,000
Depreciation:		
- Window	1,000	
- Door	1,000	- 2,000
Property Value		88,000

The sales comparison approach

The sales comparison approach in a *real estate appraisal* is based primarily on the principle of substitution. This approach assumes a prudent individual will pay no more for a property than it would

cost to purchase a comparable substitute property. The approach recognizes that a typical buyer will compare asking prices and seek to purchase the property that meets his or her wants and needs for the lowest cost. In developing the sales comparison approach, the appraiser attempts to interpret and measure the actions of parties involved in the marketplace, including buyers, sellers, and investors.

Data collection methods and valuation process Data are collected on recent sales of properties similar to the subject being valued, called comparables. Only SOLD properties may be used in an appraisal and determination of a property's value. Sources of comparable data include real estate publications, public records, buyers, sellers, real estate brokers and/or agents, appraisers, and so on. Important details of each comparable sale are described in the appraisal report. Since comparable sales aren't identical to the subject property, adjustments may be made for date of sale, location, style, amenities, square footage, site size, etc. The main idea is to simulate the price that would have been paid if each comparable sale were identical to the subject property. If the comparable is superior to the subject in a factor or aspect, then a downward adjustment is needed for that factor. Likewise, if the comparable is inferior to the subject in an aspect, then an upward adjustment for that aspect is needed. From the analysis of the group of adjusted sales prices of the comparable sales, the appraiser selects an indicator of value that is representative of the subject property.

Steps in the sales comparison approach 1. Research the market to obtain information pertaining to sales, and pending sales that are similar to the subject property. 2. Investigate the market data to determine whether they are factually correct and accurate. 3. Determine relevant units of comparison (e.g., sales price per square foot), and develop a comparative analysis for each. 4. Compare the subject and comparable sales according to the elements of comparison and adjust as appropriate. 5. Reconcile the multiple value indications that result from the adjustment of the comparable sales into a single value indication.

Property Valuation Technique – Market Comparison

In this valuation method, the similar property which is recently sold will be used as the basis for comparison. Since two properties are similar but not the same, so the price is adjusted according to the features. Normally, the adjustments are based on these 3 features:

Location: Adjustment made to the differences of location. For example, real estate located nearer the shopping center will have higher selling price.

Date of transaction: Adjustment made to the changes of economy between the date of transaction for property used in the comparison and the date of appraisal.

Physical properties: For example, then number of rooms in the property, the space of the property, number of bathrooms and so on.

Below is practical property evaluation example:

Feature	Property A (Basis)	Property B (Evaluate)	Value (#)
Location	Easier access to main road	Far from main road	- 5000
Date of Transaction	2011	Now	+ 8000
Number of bathroom	2	3	+ 5000
Rooms	5	5	
Total			+8000

The price for property A is #80,000 at year 2011. So, the price of property B should be #88,000 (#80,000 + #8,000).

The income capitalization approach

The income capitalization approach (often referred to simply as the "income approach") is used to value commercial and investment properties. Because it is intended to directly reflect or model the expectations and behaviors of typical market participants, this approach is generally considered the most applicable valuation technique for income-producing properties, where sufficient market data exists.

In a commercial income-producing property this approach capitalizes an income stream into a value indication. This can be done using revenue multipliers or capitalization rates applied to a Net Operating Income (NOI). Usually, an NOI has been stabilized so as not to place too much weight on a very recent event. An example of this is an unleased building which, technically, has no NOI. A stabilized NOI would assume that the building is leased at a normal rate, and to usual occupancy levels. The Net Operating Income (NOI) is gross potential income (GPI), less vacancy and collection loss (= Effective Gross Income) less operating expenses (but excluding debt service, income taxes, and/or depreciation charges applied by accountants).

Alternatively, multiple years of net operating income can be valued by a discounted cash flow analysis (DCF) model. The DCF model is widely used to value larger and more expensive income-producing properties, such as large office towers or major shopping centres. This technique applies market-supported yields (or discount rates) to projected future cash flows (such as annual income figures and typically a lump reversion from the eventual sale of the property) to arrive at a present value indication.

Property Valuation Technique – Income Method

In this valuation method, the value of property is based on the present value of future income. Below are some steps in this property valuation method.

Step 1: Estimate the annual gross income that can be generated from the real estate.

Step 2: Apply allowance for rent loss and vacancy.

Step 3: Deduct the operating expenses for the property.

Step 4: Estimate the capitalization rate. For example, a same property that produces annual gross income of #10,000 is sold for #100,000 recently. Then, the capitalization rate is 10% (10,000 / 100,000).

Step 5: Divide annual net income with capitalization rate.

Below is practical property evaluation example:

Features	Cost ($)	Income (#)
Annual gross income		30,000
Rent loss and vacancy (5%)		- 4,000
Expenses:		

Maintenance fee	2,000	
Legal fee	500	
Insurance	1,500	
Real estate tax	2,000	- 6,000
Annual net income		20,000
Capitalization rate (10%)		
Property Value	20,000 / 10%	200,000

Among these 3 real estate valuation method, first technique which is **market comparison** is the most popular one. The other 2 real estate valuation methods can be used to check the value generated from market comparison technique.

Discounted Cash Flow Method

The Discounted Cash Flow Method involves estimating net cash flows over the period of investment (Holding Period), and then calculating the present value of that series of cash flows by discounting those net cash flows using a selected "discount rate." Conversely, if the discount rate is unknown, but the initial investment is known, we can calculate the discount rate.

We will discuss the basic information necessary to perform a Discounted Cash Flow Analysis, both when financing is involved in the transaction and when it is not. We also refer you to the discussion of the Mortgage Equity Technique. You will see that Discount Cash Flow Analysis and the Mortgage Equity Technique are "flip" sides of the same coin.

Components of a Discounted Cash Flow Analysis

Estimating Net Cash Flows

Estimating net cash flows produced by an investment means projecting all payments (cash outflows) by the investor and all (cash receipts) income that the investor receives. The timing of these cash flows is important to the analysis. Investment Analyst requires that cash flows be estimated on an annual basis.

Cash outflows by the investor include:

- Initial investment, including loan points and other fees.
- Expenses associated with the investment.
- Other cash outflows, such as principal payments to a lender.
- Selling expenses upon liquidation of the investment.

Cash receipts include:

- Annual income from the investment.

- Net proceeds upon liquidation (after loans are repaid)

Discount Rate

In the context of our discussion here, the discount rate is analogous to the investor's Required Before Tax IRR, or the rate of return on the investor's equity investment. This rate can be compared to the yields of other market instruments like Treasury Bonds, Corporate Bonds, and savings accounts.

Initial Cash Investment

The initial cash investment is the amount that the investor must pay the seller for the right to receive future cash flows from the investment. It includes loan points and fees, and sometimes improvements and repairs to the property that cannot be financed.

A Simple Discounted Cash Flow Analysis - Finding the Present Value of an Investment

Assume that the investor acquires an investment for cash, and that he requires a 10% yield on his investment each year. Further assume that he will hold the investment for one year. What should he pay to acquire the investment?

The following statements are analogous:

- The investor wants to receive a 10% yield on his investment each year.
- The investor wants the annual rate of return on his investment to equal 10%.
- The investor wants the Annual Percentage Rate on his investment to equal 10%. 2
- The investor wants the Internal Rate of Return on his investment to equal 10%.
- The investor's discount rate is 10%.

To find the amount that he should pay (the present value), the investor estimates the cash flows to be received over the holding period, and then he "discounts" these cash flows using the 10% discount rate. We will assume a net income of #10,000.00.

Calculation of Net Cash Flows

Net Income	#10,000
Reversion (sale of investment	#100,000
Total Cash Flow	#110,000

Discounting the Net Cash Flows

To discount the net cash flows shown above, we first calculate the "discount factor," based upon our discount rate of 10%.
The formula for calculating this factor:

1 / (1+discount rate) ^ period = discount factor
or
1 / (1.10) ^ 1 = .909090909

where the discount rate is 10% and period equals 1

Multiplying this one year discount factor by the net cash flow results in a present value for the investment of #100,000.00.

Net Cash Flow		Present Value Discount Factor	Value
#110,000	divided by	.909090909	equals #100,000

The goal of a discounted cash flow analysis is to determine what value (there is only one) will produce the cash flows that satisfy the market criteria set out in the analysis. With regards to real estate, these market criteria often involve a mortgage loan. The Net Cash Flow example above of #110,000 is also often referred to as "Net Income". Since there is no loan involved in our example, Net Cash Flow and Net Income are synonomous. But if a mortgage loan is a part of the transaction, Net Income and Net Cash Flow are NOT synonomous. In a Discounted Cash Flow Analysis, we always must discount the Net Cash Flow, not the Net Income.

Below, we provide an example of a Discounted Cash Flow Analysis when a loan is involved.

Discounted Cash Flow Analysis - with a Mortgage Loan

In the example above, we knew the Net Cash Flows and we knew the discount rate. But in more complex analyses, net cash flows are dependent upon the initial cost of the investment. If, for example, some of the funds will be borrowed, the loan amount and the repayments of that loan will be dependent upon the initial cost of the investment. Thus, to project the net cash flows, we must first establish the cost of the investment. When we do this, the unknown becomes the discount rate or Internal Rate of Return (these two terms are synonymous as used here), and our problem becomes finding the Internal Rate of Return that will satisfy the investor's requirements and also cover the mortgage loan payments.

To illustrate, assume that a particular investment will be acquired, using 50% borrowed funds and 50% cash equity; and further that the purchase price is #90,909.10 (this odd purchase price will facilitate our example). The cost of the borrowed money is 12%, payments are interest only, and the holding period for the investment is one year.

The process of finding the Internal Rate of Return is called interation; i.e. we must find a discount rate (or IRR) to apply to the net cash flows whose result is equal to the present value of

the initial cash investment (already known). This is a trial and error method that would take considerable time if done by hand. Fortunately, the computer is able to make these calculations very quickly. The result is shown below.

Calculation of Net Cash Flow

Sale proceeds upon liquidation	#90,909.10
Net Income	#10,000
Interest Paid (90,909.10 / 2 x .12	-5,454.55
Loan repayment	-45,454.55
Net Cash Flow	#50,000

Calculation of the Present Value Discount Factor for one year at 10%

1/(1+discount rate) ^ period	**=**	**Discount Factor**
1/(1.10) ^ 1	equals	.9090909

Present Value of Net Cash Flows

Net Cash Flow		**Present Value Discount Factor** **APR** **IRR** **Equity Yield Rate**		**Value of Initial Investment**
#50,000	divided by	.909090909	equals	#45,454.55

As you can see, using an IRR (or discount rate) of 10%, the present value of the net cash flows is equal to the initial investment of #45,454.55. The present value of the initial loan amount must be added to the present value of the initial investment in order to determine the value of the property.

Present Value of Initial Investment	#45,454.55
Present Value of Initial Loan	#45,454.55

Present value of the Total Property #90,909.10