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REA625
Real Estate Valuation

Lecture 8



Real Estate Management

Lecture 8

REA625

Real Estate Valuation

Prepared by

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Recap - Lecture 7

Income Approach

The Definition According to the Three International Standards

Fundamental Principles of the Income Approach

Conditions for Applying the Income Approach

Suitability for the Application of the Income Approach

Income Approach Methods

Challenges and Mitigation Measures

Cost Approach

The Definition According to the Three International Standards

Fundamental Economic Principles

When is the Cost Approach Applied?

Contents

- *Cost Approach*
 - ✓ *The Definition According to the Three International Standards*
 - ✓ *Core Concept of the Cost Approach*
 - ✓ *Fundamental Principles of the Cost Approach*
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 - ✓ *When is the Cost Approach Applied?*
 - ✓ *Components of the Cost Approach (DRC)*
 - ✓ *Steps of Applying the Cost Approach (DRC)*
 - ✓ *Challenges and Mitigation Measures*
 - ✓ *Comprehensive Comparison of Valuation Approaches*

The Main Valuation Approaches

Valuation Approaches

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graph TD; A[Valuation Approaches] --> B[1. Market (Sales Comparison) Approach]; A --> C[2. Income Approach]; A --> D[3. Cost Approach];
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1. Market (Sales Comparison) Approach

This approach is based on **comparing the subject property** with **similar properties** that have been sold in the market.

2. Income Approach

This approach converts **expected future cash flows** into a **present value** through **capitalization or discounting techniques**.

3. Cost Approach

This approach is based on **estimating the cost of constructing a comparable asset**, less **depreciation**.

3. Cost Approach

➤ The Definition According to the Three International Standards

IVS 2024

“The cost approach provides an indication of value using the economic principle that a buyer will pay no more for an asset than the cost to obtain an asset of equal utility, whether by purchase or construction.”

RICS Red Book 2023

“The cost approach provides an indication of value using the principle that the price a buyer would pay for the asset would not exceed the cost of acquiring or constructing an equivalent asset.”

EVS 2020 – TEGOVA

“The cost approach is based on the principle of substitution, whereby the value of a property is derived from the cost of replacing it with an equivalent property, adjusted for depreciation.”

3. Cost Approach

➤ Core Concept of the Cost Approach

Value = Land Value + Replacement Cost – Depreciation

A rational buyer will not pay more than the cost to construct an equivalent asset

The Principle of Substitution is the theoretical basis

3. Cost Approach

➤ Fundamental Principles of the Cost Approach

Fundamental Principles of the Cost Approach

➤ **Principle 1: Substitution**

➤ **Principle 2: Balance**

➤ **Principle 3: Highest and Best Use**

3. Cost Approach

➤ Fundamental Principles of the Cost Approach

➤ Principle 1: Substitution

Concept	Application
Basis	A rational purchaser will not pay more than the cost of acquiring or constructing an equivalent substitute
Constraint	The substitute must provide the same utility
Timing	Without unreasonable delay

3. Cost Approach

➤ Fundamental Principles of the Cost Approach

➤ Principle 2: Balance

Optimal value is achieved when the components of the property are in proper proportion:

Land : Buildings : Improvements

➤ Principle 3: Principle 3: Highest and Best Use

Factor	Impact
Current use	May not represent the optimal use
Alternative uses	Influence land value
Legal constraints	Limit available options

3. Cost Approach

➤ Conditions for Applying the Cost Approach

Condition	Description	Requirements
1. Applicability of the Substitution Principle	The asset must be capable of being replaced by an equivalent asset providing similar utility	Availability of a feasible substitute that can be constructed or acquired
2. Availability of Cost Data	Reliable information on construction or replacement costs must be available	Up-to-date data on materials, labour, and construction costs
3. Ability to Estimate Depreciation	All forms of depreciation must be measurable	Assessment of physical deterioration, functional obsolescence, and economic obsolescence
4. Separate Valuation of Land	Land value must be assessed independently from improvements	Use of the market (sales comparison) approach to value land
5. Nature of the Asset (Specialized Property)	Applied when market or income data is limited or unavailable	Rarely traded properties (e.g., hospitals, schools, industrial facilities)

3. Cost Approach

➤ When is the Cost Approach Applied?

Situation	Rationale	Examples
Specialized properties	Lack of comparable market evidence	Hospitals, schools, power plants
Public and government properties	Not typically traded in the open market	Government buildings, embassies
New or recently constructed properties	Cost is a good proxy for market value	Newly completed developments (0–5 years)
Insurance purposes	To estimate replacement/reinstatement cost	Fire insurance valuations
Absence of income	Income approach cannot be applied	Government buildings, schools
Financial reporting (IFRS)	Required for specialised assets valuation	Factories, plant and equipment
Taxation disputes	To support objections to assessed values	Property tax appeals
Emerging or inactive markets	Limited availability of reliable market data	Remote or underdeveloped areas

3. Cost Approach

➤ Components of the Cost Approach (DRC)

$$\text{Value} = \text{Land Value} + \text{Replacement Cost} - \text{Depreciation}$$

$$\text{Cost Approach} = \text{Depreciated Replacement Cost (DRC)}$$

Components of the Cost Approach (DRC)

1. Land Value

2. Replacement Cost

3. Depreciation

3. Cost Approach

➤ Components of the Cost Approach (DRC)

1. Land Value

Land is non-depreciable.

Land is valued separately from buildings, as if vacant, based on:

Highest and Best Use (HBU)

Typically using the Market Approach (Direct Comparison Method)

Considering planning permissions and development rights

3. Cost Approach

➤ Components of the Cost Approach (DRC)

1. Land Value

Methods of Estimating Land Value

① Direct
Comparison Method

② Allocation
Method

③ Extraction
Method

④ Residual Method

3. Cost Approach

➤ Components of the Cost Approach (DRC)

1. Land Value

➤ Methods of Estimating Land Value

1 Direct Comparison Method

Comparing the subject land with recently sold comparable land parcels.

Steps

Select comparable transactions

Apply adjustments for: (Location/Size/Use/Date of sale)

Derive unit rate (e.g., per m²)

Multiply by land area

This is **the most reliable and preferred method** under RICS and IVS

Considered **the primary benchmark** when **market data is available**

3. Cost Approach

➤ Components of the Cost Approach (DRC)

1. Land Value

➤ Methods of Estimating Land Value

① Direct Comparison Method



Example:

- Comparable land: 2,000 SAR/m²
- Area: 1,000 m²

→ Value = 2,000,000 SAR

3. Cost Approach

➤ Components of the Cost Approach (DRC)

1. Land Value

➤ Methods of Estimating Land Value

② Allocation Method

Estimating land value as a proportion of total property value.

$$\text{Land Value} = \text{Land Ratio} \times \text{Total Property Value}$$

When is it
used?

Limited land market data

Non-transparent markets

Preliminary or indicative valuation

As a supporting or secondary method

This is an **approximate method**

Based on **assumptions** rather than **direct market evidence**

3. Cost Approach

➤ Components of the Cost Approach (DRC)

1. Land Value

2 Allocation Method

➤ Methods of Estimating Land Value

Factor	Impact
Market conditions	Higher demand increases land ratio
Location	Prime locations increase land proportion
Highest & Best Use	More valuable use increases land value
Property type	Commercial > Industrial in land ratio
Zoning & density	Higher FAR increases land value
Building cost	Lower building cost → higher land ratio
Depreciation	Higher depreciation → higher land ratio
Risk & investment	Higher risk may reduce land proportion

3. Cost Approach

➤ Components of the Cost Approach (DRC)

1. Land Value

2 Allocation Method

➤ Methods of Estimating Land Value



Example:

➤ Total Property Value = 5,000,000 SAR

➤ Land Ratio = 30%

→ Land Value = 1,500,000 SAR

3. Cost Approach

➤ Components of the Cost Approach (DRC)

1. Land Value

➤ Methods of Estimating Land Value

3 Extraction Method

Deriving land value from an improved property.

Land Value = Total Property Value – (Building Cost – Depreciation)

Steps

Estimate total market value

Estimate replacement cost (Cost New)

Deduct depreciation

Deduct building value

3. Cost Approach

- Components of the Cost Approach (DRC)

1. Land Value

3 Extraction Method

- Methods of Estimating Land Value



Example:

- Property Value = 5,000,000
- Depreciated Building Value = 3,200,000

→ Land Value = 1,800,000 SAR

Highly
sensitive to
accurate
depreciation
estimation

3. Cost Approach

➤ Components of the Cost Approach (DRC)

1. Land Value

④ Residual Method

➤ Methods of Estimating Land Value

Used to value development land by deducting all development costs and developer's profit from the completed development value.

$$\text{Land Value} = \text{GDV} - (\text{Total Costs} + \text{Developer's Profit})$$

GDV = Gross Development Value

TC = Total Development Costs

DP = Developer's Profit

3. Cost Approach

➤ Components of the Cost Approach (DRC)

1. Land Value

4 Residual Method

➤ Methods of Estimating Land Value



Estimate GDV

Calculate costs:

- ✓ Construction
- ✓ Professional fees
- ✓ Finance
- ✓ Marketing

Deduct developer's profit

Residual = Land Value

3. Cost Approach

➤ Components of the Cost Approach (DRC)

1. Land Value

4 Residual Method

➤ Methods of Estimating Land Value



Example:

➤ $GDV = 10,000,000$

➤ $Costs = 7,000,000$

➤ $Profit = 1,000,000$

Often used with
**Discounted Cash
Flow (DCF)**

→ $Land\ Value = 2,000,000$

The **residual method** is **highly sensitive** to input assumptions, requiring **robust sensitivity analysis** and **full documentation**.

3. Cost Approach

➤ Components of the Cost Approach (DRC)

1. Land Value

➤ Methods of Estimating Land Value

Method	Accuracy	Reliability	Use
Direct Comparison	★★★★★	Very High	Best option
Extraction	★★★★	Good	When building data is available
Allocation	★★	نسبياً Low	Preliminary estimation
Residual	★★★	Strong for development	Investment (development) land

3. Cost Approach

➤ Components of the Cost Approach (DRC)

2. Replacement Cost

A) Replacement Cost (Most Commonly Used)

The **cost of constructing a modern equivalent asset** that provides the same utility, using **current materials, standards, and construction techniques**.

B) Reproduction Cost (Less Commonly Used)

The **cost of creating an exact replica of the original building** using **identical materials, design, and specifications**.

Type	Definition	Use
Replacement Cost	Constructing a modern equivalent asset with the same utility	Most commonly used
Reproduction Cost	Constructing an exact replica of the original asset	Used for heritage and historic buildings with unique characteristics

3. Cost Approach

➤ Components of the Cost Approach (DRC)

➤ Methods of Estimating Replacement Cost

2. Replacement Cost

Method	Academic Description	Application (Example)	Accuracy
Quantity Survey Method	Based on a detailed breakdown of all project components (materials, labor, equipment) using bills of quantities; considered the most accurate method	Summing all elements (excavation + concrete + finishes + MEP works) = total cost (e.g., 1,230,000 SAR)	Very High
Unit Comparison (m² Method)	Based on a unit cost per square meter derived from comparable projects, adjusted for location and specifications	Area × unit cost (500 × 3,500 = 1,750,000 SAR)	Moderate
Functional Unit Method	Based on cost per functional unit (e.g., office, room, hospital bed), suitable for repetitive buildings	Number of units × cost per unit (10 offices × 150,000)	Good
Cost Indices Method	Updates historical costs using construction cost indices to reflect current price levels	Historical cost × index factor	Good
Market & Contractor Data	Based on current market data such as contractor quotations and feasibility studies, reflecting actual expected costs	Using contractor bids for similar projects	High

3. Cost Approach

- Components of the Cost Approach (DRC)
- Methods of Estimating Replacement Cost

2. Replacement Cost



Quantity Survey Example

Item	Quantity	Unit Rate	Total
Excavation & Foundations	200 m ³	150	30,000
Concrete Works	150 m ³	800	120,000
Masonry	400 m ²	200	80,000
Finishes	500 m ²	1,500	750,000
Electrical Works	Lump sum	—	150,000
Plumbing Works	Lump sum	—	100,000
Total			1,230,000

3. Cost Approach

- Components of the Cost Approach (DRC)
- Methods of Estimating Replacement Cost

2. Replacement Cost

No single method is universally appropriate

Selection depends on:

- ✓ Required level of accuracy.
- ✓ Data availability
- ✓ Valuation purpose
- ✓ Property type

**Accuracy
Ranking:**

Quantity Survey → Market Data → Functional Unit → Cost Indices → Unit Comparison

3. Cost Approach

➤ Components of the Cost Approach (DRC)

3. Depreciation

Depreciation in real estate valuation is any loss in value of a building relative to its replacement cost, and it includes three main types:

The Main Types of Depreciation

1) Physical Deterioration

2) Functional Obsolescence

3) Economic (External)
Obsolescence

3. Cost Approach

➤ Components of the Cost Approach (DRC)

3. Depreciation

1) Physical Deterioration

Caused by: Natural wear and tear over time & Deferred maintenance

Condition	Estimated Depreciation
Very Good	5–15%
Good	15–30%
Average	30–50%
Poor	50–75%
Very Poor	75–95%



Example:

- Effective Age= 15 years
- Total Economic Life= 60 years

$$\text{Physical Depreciation} = \frac{\text{Effective Age}}{\text{Total Economic Life}} \times 100\%$$

Physical Depreciation= 25%

3. Cost Approach

➤ Components of the Cost Approach (DRC)

3. Depreciation

2) Functional Obsolescence

Results from the building's **inability to meet modern functional requirements:**

Example	Cause
Outdated design	Changing market needs
Low ceiling height (industrial)	Technological advancement
Insufficient parking	Changing mobility patterns
Poor energy efficiency (ESG)	Environmental requirements
Lack of smart systems	Technological development

3. Cost Approach

➤ Components of the Cost Approach (DRC)

3. Depreciation

3) Economic (External) Obsolescence

Results from **external factors beyond the property's control:**

Example	Cause
Change from commercial to residential zoning	Urban planning changes
Decline in demand	Economic trends
Nuisance nearby (e.g., landfill)	External planning decisions
Economic crisis	Macroeconomic conditions
ESG regulatory requirements	Legal/environmental changes

Negative ESG characteristics (e.g., poor energy efficiency) may be considered a form of economic obsolescence.

3. Cost Approach

➤ Components of the Cost Approach (DRC)

3. Depreciation

Comparison of Depreciation Types

Type	Description	Curability	Impact	Measurement	Example
Physical	Wear and tear over time	Usually curable	Direct impact	Repair cost or age-life method	Cracks, deterioration
Functional	Design or utility inefficiency	Sometimes curable	Moderate to high	Cost to cure or value adjustment	Poor layout, outdated systems
Economic	External adverse factors	Incurable	Significant	Market analysis	Noise, pollution

3. Cost Approach

➤ Components of the Cost Approach (DRC)

3. Depreciation



Example:

- Building Age: 15 years
- Economic Life: 50 years
- Replacement Cost New: 3,000,000 SAR

Type	Calculation	Value
Physical (curable)	Deferred maintenance	50,000
Physical (incurable)	$(15/50) \times 3,000,000$	900,000
Functional	$5\% \times \text{cost}$	150,000
Economic	$3\% \times \text{cost}$	90,000
Total Depreciation		1,190,000

→ Depreciated Value = $3,000,000 - 1,190,000 = 1,810,000$

3. Cost Approach

➤ Steps of Applying the Cost Approach (DRC)

$$\text{Value} = \text{Land Value} + \text{Replacement Cost} - \text{Depreciation}$$

Step 1: Estimate Land Value (as if vacant, Highest and Best Use)

Step 2: Estimate Replacement Cost of improvements

Step 3: Estimate Physical Depreciation

Step 4: Estimate Functional Obsolescence

Step 5: Estimate Economic Obsolescence

Step 6: Calculate Total Depreciation

Step 7: Deduct depreciation from replacement cost

Step 8: Add land value

Step 9: Derive Depreciated Replacement Cost (DRC)

Step 10: : Checking with other valuation approaches

3. Cost Approach

➤ **Comprehensive Numerical Example :**

Valuation of a Government Hospital Using the Cost Approach (DRC)

Property Data

Item	Details
Property Type	Specialized Government Hospital
Land Area	5,000 m ²
Building Area	8,000 m ²
Effective Age	15 years
Total Economic Life	50 years
Condition	Good (regular maintenance)

3. Cost Approach

➤ Comprehensive Numerical Example

Stage 1: Estimation of Land Value

Item	Calculation	Value (SAR)
Land Area	5,000 m ²	—
Land Rate (Market Comparison)	2,500 SAR/m ²	—
Land Value	$5,000 \times 2,500$	12,500,000

Stage 2: Replacement Cost (Cost New)

Item	Calculation	Value (SAR)
Building Area	8,000 m ²	—
Construction Cost	3,500 SAR/m ²	—
Replacement Cost	$8,000 \times 3,500$	28,000,000
Professional Fees (10%)	$28,000,000 \times 10\%$	2,800,000
Total Replacement Cost		30,800,000

3. Cost Approach

➤ Comprehensive Numerical Example

Stage 3: Estimation of Total Depreciation

A) Physical Depreciation

Item	Calculation	Value
Effective Age	15 years	—
Economic Life	50 years	—
Depreciation Rate	$15 \div 50$	30%
Physical Depreciation	$30,800,000 \times 30\%$	9,240,000

3. Cost Approach

➤ Comprehensive Numerical Example

Stage 3: Estimation of Total Depreciation

B) Functional Obsolescence

Item	Description	Value (SAR)
Outdated medical systems	Requires upgrading	800,000
Poor energy efficiency	Low energy rating	400,000
Total Functional Obsolescence		1,200,000

C) Economic (External) Obsolescence

Item	Description	Value (SAR)
Decline in demand	Due to new competing hospital	500,000
Total Economic Obsolescence		500,000

3. Cost Approach

➤ Comprehensive Numerical Example

Total Depreciation

Type	Value (SAR)	Percentage
Physical Depreciation	9,240,000	30.0%
Functional Obsolescence	1,200,000	3.9%
Economic Obsolescence	500,000	1.6%
Total Depreciation	10,940,000	35.5%

3. Cost Approach

➤ Comprehensive Numerical Example

Stage 4: Final DRC Calculation

Item	Value (SAR)
Total Replacement Cost	30,800,000
Less: Total Depreciation	(10,940,000)
Depreciated Building Value (DRC)	19,860,000
Add: Land Value	12,500,000
Total Property Value (DRC)	32,360,000
Rounded Value	≈ 32,500,000 SAR

3. Cost Approach

➤ Challenges and Mitigation Measures

Challenge	Description	Impact	Mitigation
Estimating Depreciation	Difficulty in accurately measuring functional and economic obsolescence	Inaccurate building value	Use age-life method + market analysis
Estimating Replacement Cost	Fluctuation in material and labor costs	Affects cost accuracy	Use updated cost indices and market data
Cost ≠ Value	Cost may differ from market value	Risk of over/under valuation	Cross-check with Market/Income approaches
Technical Data	Limited detailed cost data	Reduced accuracy	Use databases and professional expertise
Inflation	Continuous cost changes	Distorts historical costs	Apply updated indices

3. Cost Approach

➤ Challenges and Mitigation Measures

Challenge	Description	Impact	Mitigation
Land Valuation	Lack of comparable sales	Difficulty in estimating land value	Use comparison or alternative methods
Economic Obsolescence	Difficult to quantify external effects	May overlook major value loss	Market analysis
Residual Method	Highly sensitive to inputs	Value volatility	Sensitivity analysis
Heritage Assets	High reproduction cost and difficulty in estimation	Risk of overvaluation	Use specialist expertise
Surplus Land	Excess land area	Misleading valuation	Apply Highest & Best Use analysis

3. Cost Approach

➤ Comprehensive Comparison of Valuation Approaches

Criteria	Market Approach	Income Approach	Cost Approach
Economic Principle	Price Equilibrium + Substitution	Anticipation of Future Benefits	Substitution
Theoretical Basis	Market prices	Present value of future cash flows	Cost of replacement
Required Data	Comparable sales	Income, expenses, cap/discount rates	Costs, depreciation, land value
Best Use	Residential & standard properties	Income-generating assets	Specialized or new assets

3. Cost Approach

➤ Comprehensive Comparison of Valuation Approaches

Criteria	Market Approach	Income Approach	Cost Approach
Strengths	Reflects market behavior	Investor-oriented	Useful when no market data
Weaknesses	Needs comparable data	Relies on assumptions	May not reflect market
Data Sensitivity	High	Very high	Moderate
Complexity	Low–Moderate	Moderate–High (DCF)	Moderate
Reliability	High with data	High for income assets	High for new assets
Objectivity	Highest	Moderate	Lower with high depreciation
Usage	Most widely used	Common in investment	Special cases
Cross-check Role	Primary benchmark	Investment support	Supporting tool

Lecture Summary: Quick Review

Cost Approach

The Definition According to the Three International Standards

Fundamental Principles of the Cost Approach

Conditions for Applying the Cost Approach

When is the Cost Approach Applied?

Components of the Cost Approach (DRC)

Steps of Applying the Cost Approach (DRC)

Challenges and Mitigation Measures

Comprehensive Comparison of Valuation Approaches



Thank You