BUSI 330

Suggested Answers to Review and Discussion Questions: Lesson 9

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1. Students should give a brief definition of each of the following terms and provide one example that illustrates how the terms are related.

   Total economic life is the period during which improvements to real estate contribute to property value. In other words, it is the length of time over which the building has economic value in its current use; at the end of its economic life, a building is replaced with some other more economically viable use. There is no set figure for economic age, because it must be estimated for each individual building based on the attitudes and reactions of typical buyers of competitive properties. Emphasis must be placed on location, building quality, leases, and economic changes in the neighbourhood.

   Remaining economic life (REL) is the estimated time remaining in the building's economic life. It can found by subtracting the building's effective age from its economic life. A building's remaining economic life is also a subjectively estimated time.

   Actual age is the number of years that have elapsed since construction was completed. In the cost method of appraisal, actual age is less relevant than economic or effective age, since it is not important how old the structure is, but rather how useful and worthwhile the market perceives it to be. This is because the physical life of a real estate improvement is typically much longer than its economic life - in other words, improvements tend to be redeveloped long before they are unusable in their current form.

   Effective age is the age based on the overall condition and use of a structure. It is different than actual age in that it is an estimate of age based on market perception. A building's effective age might be less than its actual age if it has had above-average maintenance, if it is of superior quality or design, or if there is a scarcity of such buildings in the market. Similarly, its effective age could be greater than its actual age if it is a structure which is in disrepair or is rapidly becoming obsolete.

   EXAMPLE: The house I live in was built in the 1960s and therefore has an actual age of approximately 60 years. It was built with average quality and design, with an economic life of perhaps 70 years. However, it has been poorly maintained in recent years, which has given it an effective age that is probably close to 70 years. As a result, its remaining economic life is likely close to zero (probably the only reason it has not been redeveloped already is because of the slump in the local real estate market). If it had been well-maintained, and perhaps was of somewhat higher quality and design, its economic life could have been 75 years, 80 years, or more, as there is a growing tendency to restore "heritage houses" in my neighbourhood.

2. Depreciation is defined as a loss of utility, hence value from any cause.

   Physical deterioration is a loss in value from tangible, physical problems; e.g., wear and tear, decay, dry rot, cracks, and structural defects.

   Functional obsolescence is a loss in value from features or designs that are inadequate given contemporary market standards; e.g., poor floor plans, mechanical deficiencies, inappropriate size, style, and age. Functional obsolescence refers to items that may still fulfill their basic function, but which are inadequate in terms of what the market demands.

   External obsolescence is a loss in value from causes outside of the property; e.g., neighbourhood infiltrations of inharmonious groups or property uses, zoning legislation, and macroeconomic factors. These external market forces are typically divided into locational obsolescence (i.e., proximity to a negative influence) or economic obsolescence (i.e., economic factors, usually felt market-wide).

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3. If the appraisal assignment had required the use of reproduction cost rather than replacement cost, the following changes would be required:

   - Building cost new would be calculated using reproduction cost, which is likely higher than replacement cost. In some cases, it can be difficult to estimate reproduction cost, due to changing technology and standards.
   - Any superadequate features would have to be added into the cost new; e.g., $1,000 for extra heavy beams.
   - The superadequate features would also have to be depreciated in the functional incurable category, using the long-lived deprecation rate.

4. The age-life method is used to answer this question:

Site Value	$650,000
Cost of Improvements ($150 × 6,000 sq. ft.)	900,000
Market Value if New	$1,550,000
Less: Depreciation (20 ÷ 40) × $900,000	450,000
Immediate Repairs	80,000
Market Value	$1,020,000

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5. COST APPROACH TO VALUE: Gold Park Community Centre

Site Value (market, vacant)[1]	$ 3,208,189
+ Cost of Improvements[2]	3,048,650
+ Developer's Profit[3]	625,684
Market Value of Property (before depreciation)	$6,882,523
– Immediate repair or replacement costs	- 800
– Depreciation from age-life calculation [4]	- 524,791
MARKET VALUE (existing property)	6,356,932
Rounded to	$6,357,000

[1] Site Value:

Current value of 60 × 120 lot [$190,000 × (1.05)[7]]	$ 267,349.08
× Number of lots [86,400 ÷ (60 × 120)]	× 12
Total Site Value, rounded	$3,208,189

[2] Cost of Improvements:

Construction Costs ($2,410,000 × 1.1)	$2,651,000
Developer's Overhead: 15% of Construction Cost ($2,651,000 × 0.15)	397,650
Total Cost of Improvements	$3,048,650

[3] Developer's Profit: 10% of (Construction Cost + Developer's Overhead + Land Cost)

0.1 × ($2,651,000 + $397,650 + $3,208,189)	$625,684

[4] Depreciation from age-life calculation:

Actual Age	7 years	
Effective Age	5 years	
Estimated Remaining Economic Life	30 years	
Life Span	35 years	
Current replacement cost new: $3,048,650 + $625,684		$3,674,334
Modified Age-Life Depreciation: (5 ÷ 35) × ($3,674,334 - $800)		$524,791

Note that in the suggested answer, the lack of handicap facilities (costing $8,000 to add) is not a consideration in the modified age-life method. The modified age-life method only costs and deducts for "immediate repair or replacement" components. The cost to build the centre did not include the cost of these items (as they don't exist yet). The lack of facilities for disabled persons is a deficiency, curable. If the breakdown method were employed, the depreciation would be estimated as the cost to add the handicap facilities at the effective date of appraisal, minus the cost to add them if the building were under construction at the effective date of appraisal.

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QUESTION NO. 6: CASE STUDY - 12 UNIT APARTMENT BUILDING

Site Value:								
Size in units			12					
Market Rate per unit			65,000					
Site value			780,000					**$780,000**
Bldg Reproduction Cost New (RCN):								
			10,800					
Building Size in GFA Sq.Ft.			$600					
Reproduction Cost P.S.F.			$6,480,000					
Total Reproduction Cost New							$6,480,000	
Accrued Depreciation:								
Physical deterioration:								
(1) Repairs Item	RCN	Cost to Repair						
	$3,000	$4,500				$4,500		
(2) Short Lived Item	RCN	Age	Life	Dep%	$ Dep			
Roof covering	$20,000	10	20	50.00	10,000			
Hot water tank	$5,500	10	15	66.67	3,667			
Heating boiler & furnace	$15,000	10	20	50.00	7,500			
Flooring	$45,000	1	10	10.00	4,500			
Stoves	$8,400	10	12	83.33	7,000			
Refrigerators	$7,800	10	12	83.33	6,500			
Totals	$101,700				39,167	$39,167		
	RCN	Age	Life	Dep%	$ Dep			
Long Lived	$6,375,300	10	50	20%	1,275,660	$1,275,060		
Functional obsolescence:								
(1) Modernization	CtoC		Old Value		$ Dep			
Two bathrooms	$ 6,000		500		5,500	$ 5,500		
(2) Poor Floor Plan	Rent Loss	GIM	Value Loss		$ Dep			
	$1,620	6.50	$10,530		10,530	$10,530		
External obsolescence:								
	Rent Loss	GIM	Value Loss	B-ratio	$ Dep			
(1) Adjacent to RR	$2,592	6.50	$16,848	75%	12,636			
(2) Rent Control	$5,040	6.50	$32,760	100%	32,760			
(3) Employment Loss	$3,600	6.50	$23,400	75%	17,550			
Total					62,946	$ 62,946		
Total Accrued Depreciation						$1,397,703	$1,397,703	
Depreciated Building Value							$5,082,297	$**5,082,297**
Site Improvements Value								$ **7,800**
Total Property Value								**$5,870,097**
Rounded to								**$5,870,000**

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7. (a) Reproduction cost is the estimated cost to construct, at current prices as of the effective date of the appraisal, an exact duplicate or replica of the building being appraised, using the same materials, construction standards, design, layout, and quality of workmanship, with consideration of all deficiencies, superadequacies, and obsolescence of the subject building. It differs from replacement cost, which is the estimated cost (at current prices) to construct a building with similar utility to the subject building using modern materials, standards, design, and layout. A replacement cost estimate does not include the cost to cure functional deficiencies in the existing improvements (as these will not exist if a building with similar utility is built to modern standards).

(b)

Comparative cost per sq. ft.	$40.00
Add for sprinkler	+0.75
	$40.75
Height adjustment	×1.10
	$44.83
Adjustment for area/perimeter	×0.90
	$40.35
Local cost multiplier	×1.10
	$44.39
Indirect costs	×1.25
Total cost per sq. ft.	$55.49
Current reproduction cost ($55.49/sq. ft. × 50,000 sq. ft.)	$2,774,500
Entrepreneurial profit @ 10%	×1.1
	$3,051,950
Plus land value	330,000
Reproduction Cost	$3,381,950
Rounded	$3,382,000

8. (a) This feature is called a superadequacy.

(b)

Cost as is	$100,000
Cost with acceptable ceiling height	−80,000
Excess cost	$20,000
Physical deterioration at 40%	−8,000
Physical value of the excess	$12,000
Cost to carry capitalized at 7.5% $8000 ÷ 0.075 ($R_B$)	+106,667
Incurable functional depreciation caused by superadequacy	$118,667

9.

	Current Replacement Cost	Actual Age	Total Useful Life	Depreciation %	Depreciation $
Roof cover	$2,000	10 years	20 years	0.50	$1,000
Floor cover	$6,000	5 years	15 years	0.33	2,000
Ceiling	$5,000	7 years	15 years	0.47	2,333
Total incurable physical deterioration, short-lived components					$5,333

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10.

Net operating income without external depreciation	$120,000
Net operating income as is	–100,000
Income loss attributable to external depreciation	$20,000
$20,000 capitalized at 0.09 (R_O)	$222,222
Allocated between land and building;	
building proportion 50%	×0.50
External depreciation attributable to building	$111,111

11.

Replacement Cost of Building Improvements			$1,550,000
Physical Deterioration			
Curable	$100,000		
Incurable—long-lived	250,000		
Incurable—short-lived	+ 50,000		
		$ 400,000	
Functional Depreciation			
Curable	$ 50,000		
Incurable	+100,000		
		150,000	
External Depreciation		+120,000	
Total Depreciation		$ 670,000	− 670,000
Depreciated value of Building Improvements			$880,000
Replacement Cost of Site Improvements		$250,000	
Depreciation of site improvements		− 50,000	
Depreciated value of site improvements		$ 200,000	+ 200,000
Total depreciated value of improvements			$1,080,000
Estimated land value			+600,000
Value of fee simple interest			$1,680,000

12. Effective age ÷ total economic life = % depreciated

10 ÷ 50 = 0.20 or 20%

Current replacement cost	$600,000
− Total cost to cure all curable short-lived components	− 50,000
Replacement cost of long-lived components	$550,000

Incurable physical deterioration in long-lived components:

0.20 × $550,000 = $110,000

13. (a)

	Sale 1	Sale 2	Sale 3
Sale Price	$499,000	$533,000	$522,800
– Site Value	$150,000	$160,000	$208,000
Depreciated Cost of Improvements	$349,000	$373,000	$314,800
Current Replacement Cost	$598,000	$653,000	$835,000
- Depreciated Cost of Improvements	349,000	373,000	314,800
Lump-Sum Depreciation	249,000	$280,000	$520,200
Depreciation as a % of RC	42%	43%	62%

(b)

	Sale 1	Sale 2	Sale 3
Depreciation as a % of RC	42%	43%	62%
÷ Age of Property (years)	15	15	20
Average annual depreciate rate	2.8%	2.87%	3.1%

Sales 1 and 2 indicate a depreciation rate of 2.8% and 2.87% per year. Sale #3 is older than the subject property, and as a result has a higher depreciation rate (indicating that the depreciation rate increases as a property ages).

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(c)

Depreciation Method	Advantages	Disadvantages
Market Extraction	- reflects principle of contribution - easy to understand - easy to apply - elements of depreciation are implicit - over time - better than age-life to demonstrate depreciation patterns - drawn from analysis of direct market comparables - can use either actual age or effective age in annual rate calculation - reliable and convincing if sales data is plentiful	- no detailed breakdown of depreciation specific to the subject property - there may be insufficient comparables available - comparables must be similar in physical, functional and external characteristics to the subject property - requires accurate estimates of site value - requires accurate and defensible estimate of cost new for each sale - must ensure differences in building value are not attributable to differences in design, quality or construction
Age-Life	- easy to understand - easy to apply - elements of depreciation are implicit - can be modified to specifically include elements of curable depreciation - is a key component of the observed condition method	- no detailed breakdown of depreciation - assumes a lump-sum depreciation can be expressed in an overall estimate - relies primarily on appraiser's estimates of effective age and remaining economic life - can be seen as too subjective, especially if effective age is significantly different from the actual age - assumes that every building depreciates on a straight-line basis, which may not be the case - in market areas where comparable properties incur types and amounts of depreciation that differ from the subject property, the method may be difficult to justify
Observed Condition	- very detailed and precise - more refined method of measuring depreciation - multiple elements of depreciation exist, and would not be accurately evaluated if another method is used - useful tool when inspecting property and to assess condition, effective age, and economic life - categorizes elements of depreciation along the lines of market influences and subject property details	- requires much more data and analysis than the other approaches - requires estimates/opinions for several components - may be seen as too hypothetical and not indicative of the reasoning of buyers and sellers in the market - requires lots of calculations, which add to the risk of arithmetic error

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14. A difference in the results obtained from the breakdown method and either the age-life or market extraction methods may result from:

- incorrect estimates in the age-life or extraction analysis
- the age-life or extraction methods may not reflect the characteristics of the depreciation in the subject property
- the subject property may suffer from an element of depreciation that is indicated in the breakdown method but not in the other methods, possible due to dissimilarities in the comparables
- one or more of the breakdown techniques may have been applied incorrectly, resulting in double counting of depreciation

15. Arguments and evidence:

- Mr. Gates' lawyers have a point, in that Mr. Gates spending this fantastic amount of money on his house does not mean it will be worth that much in the open market. Does cost equal value?
- The assessor argues there is no market evidence, with no reasonably similar comparables; therefore, the cost approach is relied upon as a method of last resort.
- Mr. Gates' lawyers respond that the appropriate competitive set may involve luxury mansions across the United States or even internationally; what would someone in this wider market pay for Mr. Gates' mansion, high tech gadgets and all?
- The assessor responds that "similar" for comparables must also mean similarity in location; therefore, sales from outside this jurisdiction are irrelevant for market value.
- There is no clear correct answer, as all of these arguments appear valid - highlighting that two accredited appraisers can present substantially different value conclusions, and neither may be clearly wrong as long as they have relied on market value evidence and a logical approach. The adjudicator is faced with a tough decision!

Endnote: the appeal was quickly withdrawn, perhaps resulting from someone in Mr. Gates' PR department realizing it is bad press for the world's richest man to be contesting his taxes! The final completed cost was $110 million and the annual tax bill $1.07 million.

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