

## Bases of Value

What is the basis of valuation for expropriation that will be done in Addis Ababa next week?

What is the basis of valuation for financial reporting purpose for tax purpose?

What is the basis of valuation for general financial reporting purpose (IFRS)?

## Highest and best use

### Based on USE:

An entity owns an investment property, which comprises land with an old warehouse on it. It has been determined that the land could be redeveloped into a leisure park. The land's market value would be higher if redeveloped than the market value under its current use. For simplicity, assume the warehouse and property are not a business. Should the fair value be based on the investment property's current use or the land's potential market value if the leisure park redevelopment occurred?

### Analysis

The property's fair value should be based on the land's market value for its potential use. The highest and best use valuation assumes the site's redevelopment. This will involve demolishing the current warehouse and constructing a leisure park in its place. The market value of the current building is based on the property's highest and best use (as a leisure park). Therefore, none of the market value should be allocated to the building. The cost to demolish the warehouse and redevelop the land should be included in determining the fair value of the land. The building's current carrying amount should be written down to zero.

### Standalone or Combination - Land

Three adjacent lots of land are acquired as part of a business combination. Each lot could be sold separately for \$5 million. As a group, buildings could be raised on the end lots, each of which could share a parking lot (constructed on the third lot). In this area, parking is scarce and buildings with parking sell for more than buildings without parking. With the parking lot, each building would sell for a higher price; the three lots together can be sold for \$20 million.

What is the highest and best use of the three adjacent lots of land?

### Analysis

The highest and best use of these lots is to develop them as buildings with a parking lot. A market participant would take the center lot and use it as a parking lot to maximize the value of the lots.

### **Valuing assets on a standalone basis or in a group — other assets.**

A pharmaceutical company acquires a company with two drugs. Drug "A" is a cholesterol lowering drug. By itself, Drug "A" is moderately effective. Drug "B" is another moderately effective cholesterol lowering drug. When taken together, Drug "A" and Drug "B" are highly effective at lowering cholesterol levels. On a standalone basis, Drug "A" has a fair value of \$100 million and Drug "B" has a fair value of \$150 million. When the drugs are valued together, Drug "A" and Drug "B" have a combined fair value of \$450 million.

What is the highest and best use, and resulting fair value of these drugs?

#### *Analysis*

The highest and best use of these drugs is to sell the products together. As a result, the total fair value of Drug "A" and Drug "B" should equal \$450 million. The value should be allocated to Drug "A" and Drug "B" (units of account) in a systematic and rational way reflecting the contributions of each drug.

### **The Concept of Value**

**Market Value** is an opinion expressed in terms of money, at which the property would change hands between a willing buyer and a willing seller, neither being under any compulsion to buy or to sell and both having reasonable knowledge of relevant facts, as of a specific date.

**Market Value – Removed** is an opinion, expressed in terms of money, at which the property would change hands between a willing buyer and a willing seller, neither being under any compulsion to buy or to sell and both having reasonable knowledge of relevant facts, considering removal of the property to another location, as of a specific date.

**Market Value in Continued Use** is an opinion, expressed in terms of money, at which the property would change hands between a willing buyer and a willing seller, neither being under any compulsion to buy or to sell and both having reasonable knowledge of relevant facts, as of a specific date and assuming that the business earnings support the value reported, without verification.

**Market Value — Installed** is an opinion, expressed in terms of money, at which the property would change hands between a willing buyer and a willing seller, neither being under any compulsion to buy or to sell and both having reasonable knowledge of relevant facts,

considering market conditions for the asset being valued, independent of earnings generated by the business in which the property is or will be installed, as of a specific date.

**Orderly Liquidation Value** is an opinion of the gross amount, expressed in terms of money, that typically could be realized from a liquidation sale, given a reasonable period of time to find a purchaser (or purchasers), with the seller being compelled to sell on an as-is, where-is basis, as of a specific date.

**Forced Liquidation Value** is an opinion of the gross amount, expressed in terms of money, that typically could be realized from a properly advertised and conducted public auction, with the seller being compelled to sell with a sense of immediacy on an as-is, where-is basis, as of a specific date.

**Liquidation Value in Place** is an opinion of the gross amount, expressed in terms of money, that typically could be realized from a properly advertised transaction, with the seller being compelled to sell, as of a specific date, for a failed, non-operating facility, assuming that the entire facility is sold intact.

## GRC Estimation

### Discussion Point on Replacement & reproduction Cost.

An investor built a luxury resort in Bishoftu Town with the 500 million birr construction costs. The costs were incredibly expensive, unique technologies that likely went far beyond what the typical market participants want (even those in the luxury resort market). If valuing this property's for IFRS purpose with the cost approach, should the valuer use reproduction or replacement cost?

#### Answer:

If seeking the value, the appraiser must focus on what the market demands - the extraordinary technical features like those in the subject's resort is likely value to owner, not market value.

Building features that go far beyond what typical market participants demand are called super-adequacy. They do not add to value, and in some cases may detract from value.

## Unit In Place Method

Example 1: Suppose that the floor and foundations of the buildings costs Birr 2,500 per square meter; the roof costs Birr 750 per square meter; and the walls cost 1,500 per linear meter;

electrical and sanitary installation costs Birr 1,500 per square meters. Notice that both the square building and the rectangular building have 400 square meters, but the square building has only 80 linear meters of walls (20m times 4) while the rectangular building has 100 linear meters of walls (10m+400m+10m+40m). Estimate the replacement cost of the two buildings.

Square Building		Rectangular Building	
Foundation & Floor (@ Birr 2,500)	1,000,000.00	Foundation & Floor (@ Birr 2,500)	1,000,000.00
Roof (@ Birr 750)	300,000.00	Roof (@ Birr 750)	300,000.00
Walls (@ Birr 1,500)	<u>120,000.00</u>	Walls (@ Birr 1,500)	<u>150,000.00</u>
Electrical & Sanitary Installation @Birr 1,500	600,000.00	Electrical & Sanitary Installation @Birr 1,500	600,000.00
<b>Total Cost</b>	<b>1,420,000.00</b>	<b>Total Cost</b>	<b>1,450,000.00</b>

### Comparative

Example: A valuer has found the construction cost for three homes which have developed recently. The homes are similar in all features except for those as indicated in the below table.

	Subject property	Comparable sale #1	Comparable sale #2	Comparable sale #3
Square-meter home/built up area	150	1,40	<i>150</i>	165
No of bed rooms	3	3	4	4
No. of bathrooms	2	2½	2½	2
No of kitchens	1	2	2	1
Construction Cost		1,500,000	Birr 1,650,000	Birr 1,930,000

The valuer estimates the following costs:

- cost of a ½ bathroom to be Birr 45,000.

- The cost of one bed room to be Birr 50,000.
- The cost of one kitchen to be Birr 40,000

The cost per square-foot for these properties can be determined as follows:

	Comparable sale #1	Comparable sale #2	Comparable sale #3
Construction Cost (Birr)	1,500,000	1,650,000	1,930,000
- bed room	0	-50,000	-50,000
- ½ Bath	- 45,000	- 45,000	0
-Kitchen	-40,000	-40,000	0
Adjusted Construction Cost (Birr)	1,585,000	1,785,000	\$1,980,000
÷ Sq. meter.	<u>041</u>	<u>051</u>	<u>561</u>
Cost/Sq. meter	11,321	11,900	12,000

Since the subject property in this example is closest in size to comparable #2, the valuer would use that result (Birr 11,900) as the cost per square-meter of the subject property. Based on this rate, the construction cost of the subject property would be Birr 1,660,000 = X 11,900 = \$107,451.50 OR

By taking the average of the last two costs (because the first comparable is far from the other two):  
 $((11,900+12,000)/2)*140 = \text{Birr } 1,673,000$  OR

By taking the cost per square meter which has minimum adjustment amount (i.e., comparable three):  
 $140*12000 = \text{Birr } 1,680,000$

### Trending Method

A Valuer has been given an assignment to appraise a building which was built in 2001 at a cost of Birr 550,000. The valuer finds the following published index. Estimate the reproduction cost of the building.

Year	Index
2001	100
2002	112
2003	134
2004	156

2005	178
2006	210
2007	250
2008	290
2009	335

**Solution:**

Current reproduction Cost = (Current Index/Base Year Index)\*Historical Cost  
 =(2009 Index/2001 Index)\*Historical Cost  
 =(335/100)\*550,000  
 =Birr 1,842,500

**Deprecation Example Physical Deterioration**

**Example 1:** A house has an estimated total life of 50 years. Its chronological age is 20 years. Its effective age, based on its condition, and environment, is 25 years because it is in poor condition and is located near a gasoline service station.

Percentage Depreciation =  $25/50 = .50$  or 50% depreciated

**Example 2:** Another house in the same neighborhood also has an estimated total life of 40 years. Its chronological age is also 20 years. Its effective age, based on its condition and environment, is 20 years because it is in average condition and there are no unusual adverse environmental influences. Estimate the depreciation.

Percentage Depreciation =  $20/40 = 0.50$  or 50% depreciated

**Example 3.** A house similar to the subject property in size, layout and other physical characteristics has total life of 50 years. The subject chronological age is 20 years. Its effective age, based on its condition and environment, is 18 years because it is in poor condition and is located near a gasoline service station. The total replacement cost of and land value of a subject house is given as 668,175 and 180,000 respectively. By Using Age-Life Method of Calculating Depreciation indicate the value of the house based on cost approach

**Solution**

- Percentage Depreciation = Effective age / total economic life = Thus the percentage is =  $18/50 = 36\%$
- Cost new of the building \* Percentage Depreciation = accrued depreciation =  $668,175 * 36\% = 240,543$
- Cost new of the building - accrued depreciation = depreciated value of the building =  $668,175 - 240,543 = 427,632$

Therefore the cost approach is applied as follows

Total cost	668,175	
Less to total depreciation	- <u>240,543</u>	
Depreciated cost	427,632	
Plus land value	<u>180,000</u>	
<b>Indicated value</b>		<b>607,632</b>

#### Example 4

House has an actual age of 25 years with a remaining life of 25 years, thus depreciating at the rate of 2 percent a year. It is the opinion of the valuer that the subject house is of the same condition and utility as similar houses that are only 20 years of age. The replacement cost of the subject house is Birr 1,200,000 and the land value is Birr 500,000. Estimate the DRC of the subject house.

Accrued depreciation (40 percent * 1,200,000).....	Birr 480,000
Depreciated Replacement Cost.....	Birr (1,200,000-480,000)=720,000
Plus land value .....	Birr 500,000
Indicated value by cost approach.....	Birr 1,220,000

A building has an actual age of 25 years and a replacement cost of Birr 500,000. The total life of the building is 50 years and it was rebuild 3 years ago. The rebuilding brought the building back to 80% of its new condition. What is the chronological age of the building, the physical deterioration in percent and the depreciated value of the building?

Solution:

Chronological age = actual age = 25 years

Effective age = Total life – Remaining life

Remaining Life before 3 years =  $0.8 \times 50 = 40$  years

Current remaining life =  $40 - 3 = 37$  years

Effective age = Total Life – Remaining life =  $50 - 37 = 13$  years

Percentage depreciation = Effective age/Total life =  $13/50 = 26\%$

Depreciated value of the building = replacement cost – depreciated amount =  $500,000 - 0.26 \times 500,000 = 370,000$

**Example 5:** Assume that you are valuing a pollution abatement facility and a law has been passed requiring the owner to abandon the facility within 3 years and replace it with a different facility. Furthermore, assume the existing assets are 5 years old and have a physical remaining life of 15 years. Estimate the percentage depreciation and DRC of the facility, if the replacement cost of the facility is birr 5,000,000.

Physical deterioration percentage depreciation =  $5/20 = 25\%$

But the facility has 3 years remaining life (by law), then the total life of the facility is  $3+5=8$  years. Percentage depreciation =  $5/8=62.5\%$ \* (it is the total (overall) depreciation (physical, functional, and economic) is approximately 63%).

## Functional Obsolescence

**Example 1:** Assume that in light of current market expectations, the five story office building appraised lacks elevator. The estimated cost of elevator as installed when the building built was Birr 450,000, but the cost to install it today Birr 800,000. Similar property with same problem sold for Birr 650,000 less than properties with elevators. The improvement is 14 years old. Estimate the functional obsolesce.

### Solution

Cost on the date of appraisal to install the elevator is Birr 800,000. The next step would be addressing the question: is it curable or incurable. The answer is easy, it is incurable because  $650,000 > 800,000$ . Hence no need to install the elevator and the functional obsolescence is Birr 150,000.

**Example 2:** Assume that in light of current market expectations, the three story office building appraised lacks elevator. The estimated cost of elevator as installed when the building built was Birr 450,000, but the cost to install it today Birr 800,000. Similar property with same problem sold for Birr 1,000,000 less than properties with elevators. The improvement is 14 years old. Calculate the functional obsolesce.

### Solution

Cost on the date of appraisal to install the elevator is Birr 800,000. The next step would be

addressing the question: is it curable or incurable. The answer is easy, it is curable because  $1,000,000 > 800,000$ . Thus the cost of curable functional obsolescence is estimated as follow:

Cost of installing the elevator = 800,000

Economic benefit by installing the elevator =  $1,000,000 - 800,000 = 200,000$ , which is the functional obsolescence of the building.

### Economic Obsolescence

**Example 1:** A single-family residence is located in a neighborhood in transition to industrial use. The marketability for this house has been adversely affected. Similar houses rent for Birr 10,000 per month. The subject property will rent for no more than \$8,000 per month. Market analysis indicates that the capitalization rate is 10 percent. Estimate the loss in value of the property due to external factor (economic obsolescence).

Monthly rent of unaffected property	10,000
Monthly rent of affected property	- <u>8,000</u>
Estimated monthly rent loss	=Birr 2,000

Birr 2,000  $\times$  12 months = Birr 24,000 rent loss per year

Birr 24,000 capitalized at 12% = \$200,000.

The amount to deduct from the building value for economic/external obsolescence is Birr 200,000.

## Sales Comparison Approach

Example 1: Assume your subject property is a three-bedroom home and that no three-bedroom homes have sold recently in the subject property's neighborhood, but that many two-bedroom homes have. Look for another nearby neighborhood with sales of both two-and three-bedroom homes. If you compare prices of two-bedroom homes in the subject property's neighborhood with the two -bedroom homes in the other neighborhood, the percentage difference can be your neighborhood adjustment. If, for example, your neighborhood sold for 9% more, now you can use the three-bedroom comparables from the other neighborhood and adjust their prices up by 9% for the neighborhood difference.

### Example 2: Calculate adjustments by matched pairs

Value Factor	Sale 1	Sale 2	Sale 3
Price	270,000	280,000	256,000
Size (sq.ft.)	2,500	2,700	2,500
Age (years)	20	20	30

Note that sales 1 and 3 differ only in age and that sales 1 and 2 differ only in size

### Analysis using Matched pairs

#### Age Difference

Sale	Age	Price
1	20	270,000
3	30	Birr 256,500

Difference 10 years = Birr 13,500

Price Difference for Age:

In Birr: 13,500/10years, or

1,350 per year.

In percent: 13,500/256, 500, or

5.26% difference

In percent per year: 5.26%/10 years,

#### Size Difference

Sale	size (sq.ft)	Price
2	2,700	280,000
1	2,500	270,000

Difference 200 sq.ft. = 10,000

Price Difference for size

Birr per square foot: 10,000/200 sq.ft.

Or Birr 50. Note that the adjustment

amount per sq.ft. is much less than the sale

price per sq.ft., a common finding.

In Percent: 10,000/270,000 = 3.70

Or 0.526% per year.

**Conclusion:** An adjustment of 50 birr per or

**Conclusion:** An adjustment at ½% per

square foot of size difference is indicated.

Year of age difference is indicated.

### Practical Illustrative Example (for discussion)

Following the instructions (from real estate developer in Addis Ababa) to value house number 'A' of Kebele 10 residential property, you have made an inspection of the house and neighborhood and collect data for comparable properties showing recent sales and other attributes. All the houses are modern and detached; and data for the subject property and the comparables are presented in the following table. Using this data you are supposed to advice the real estate developer on the value of the house by sales comparison approach using percentage adjustment.

COMPARISON ELEMENTS	Subject	Sale 1	Sale 2	Sale 3	Sale 4
Sale Price		7,286,957	5,750,000	9,250,000	7,563,288
Date of Sale		May-15	Oct-14	Jan-15	Sep-14
Building Size	380	371	400	415	410
Age/Condition		Same	Same	Same	Same
Quality of Construction, material	Very Good	Same	Same	Superior	Same
Lot Size	420	350	452	450	440
Bed Rooms	3	4	3	4	4

### Valuation Process

As it is discussed above, the Sales Comparison Approach utilizes sales of comparable properties, adjusted for differences, to indicate a value for the subject property. Valuation is typically accomplished using a unit of comparison such as price per square meter. Percentage adjustments are applied to the units of comparison from an analysis of comparable sales, and the adjusted unit of comparison is then used to derive a total value.

### Source of Sales Comparables Data

Comparables were analyzed to ascertain the market value. The sources of data are the nearby active real estate developers who have been working for the last ten years in the area and individual buyers/owners. This is the result of the market research of similar comparables with the subject properties in same submarket. As a result there are about five real estate developers within one 500 meter radius. The comparable from one Real Estate is smaller in plot and building

size, inferior in construction material and workmanship, and also inferior in locational attributes, and hence it is not part of the analysis.

In analyzing the market for comparable properties, the valuer has compared the subject property to similar properties in the subject's market area. These are discussed below.

#### **Comparable No. 1**

The property is owned by real estate developer. The plot area is 350 square meters and the gross building/living area is 371.00 square meters. The property contains four bed rooms and one living & guest room. The asking price was Birr 7,286,957. The property is under construction and will be completed within 3 months. The location of the property has a good view to the city and has excellent asphalt access road, the building quality and the amenities are also similar. The difference lies on plot area and number of bed rooms. This data was collected from real estate developer and the property was ready for sale on the date of data collection, 29 May 2015.

#### **Comparable No. 2**

The property is owned by private owner. The plot area is 452 square meters and the gross living area is 400.00 square meters. The property contains three bed rooms and one living & guest room. The selling price was Birr 5,750,000. The location is inferior to the subject property because there are no paved asphalt roads and has less quality services to the property. Moreover there are differences on plot area between the subject and comparable property. The data was collected from the buyer/owner and the property was ready for sale on the date of data collection, 01 October 2014.

#### **Comparable No. 3**

The property is owned by private owner. The plot area is 450 square meters and the gross living area is 415.00 square meters. The property contains four bed rooms and two living & guest room. The asking price is Birr 9,250,000. The location is almost the same as to the subject property. The condition is excellent (new) but there are differences on built up area and plot area. The data was collected from the buyer/owner and the property was ready for sale on the date of data collection, 28 January 2015.

#### **Comparable No. 4**

The property is owned by real estate developer. The plot area is 440 square meters and the gross living area is 410 square meters. The property contains four bed rooms and two living & guest room. The selling price was Birr 7,563,228. The date of property sold was 12 September 2014. The location of comparable no. 4 is similar to the subject property, the building quality and the amenities are also similar, the difference lies on built up and plot area. The property contains four bed rooms and one living & guest room.

#### **Adjustments**

The first adjustment made to the market data takes into account differences between the subject property and the comparable property sales with regard to the legal interest transferred. Advantageous financing terms or peculiar conditions of sale were then adjusted to reflect a normal market transaction. Next, changes in market condition must be accounted for, thereby

creating a time adjusted normal unit of comparison. Lastly, adjustments for location, the physical traits like size, shape, age, condition, quality etc and amenities were made in order to generate the final adjusted unit rate, which is appropriate for the subject property.

### ***Adjustment for Property Rights Conveyed***

All of the comparables utilized in this analysis involved the transfer of the leasehold interest. Similarly the subject property is leasehold interest and therefore, no adjustments were required.

### ***Financial Terms***

To the best of our knowledge, all of the sales utilized in this analysis were accomplished with cash or a cash-equivalent market-oriented financing. Therefore, no adjustments were required.

### ***Conditions of Sale***

Adjustments for conditions of sale usually reflect the motivations of the buyer and the seller. In many circumstances the conditions of sale may significantly affect transaction prices. The valuer could not able to check the condition of sale during the transaction due to unavailability of data. Hence, the valuer assumes, all sales used in this analysis are considered to be "arms-length" market transactions between both knowledgeable buyers and sellers on the open market. Therefore, no adjustments were required.

### ***Market Condition/Date of Sale***

One of the main factors affecting the value of property is time. The same property has different value when the date of sales is different. In Addis Ababa, generally the values of properties have been showing an increasing trend for the last decade in the market. Based on the valuer experience and analysis the average annual growth rate for property price in the submarket for the last four years was more than 21 percent. Similarly the land lease price has been also showing an increasing trend. For instance, the land lease price for residential in the subject submarket has been increasing on average by 26 percent annually. The valuer took a conservative estimate of 21 percent annual adjustment for market condition/date of sale.

### ***Location***

An adjustment for location is required when the locational characteristics of a comparable property are different from those of the subject property. The subject property is considered to have a good location, and it has good access and visibility. We have made a negative adjustment to those comparables which are considered superior in location versus the subject. Conversely, a positive adjustment was made to those comparables that are considered inferior in location attributes. Each comparable was adjusted accordingly.

### ***Physical Traits***

Various physical factors were analyzed including size, shape, age, condition, quality, amenities, utility, etc. When a property was considered inferior to the subject, a positive adjustment was applied. When a property was determined to be superior to the subject, a negative adjustment was applied.

### ***Quality of construction material***

The quality of construction material is one factor which has an impact on the value of a property. Hence, upward adjustments were made to lower quality construction material, and downward adjustments were made to higher quality construction material.

### ***Utility***

The subject properties have a good utility. The parcels are adequately shaped to accommodate a typical building, and they have good access, frontage and visibility. When a comparable is considered to have superior or inferior utility, an adjustment was made.

### ***Construction Stage of Property***

Most of the subject properties were completed before a year except comparable 1 which is also in the course completion (97% is completed). The period needed to complete the construction of a comparable 1 may take 2 months. Hence adjustments were made for this factor for the risks associated with time (if someone buys a building that is 100 percent completed then he definitely saves rent from the newly acquired house). The valuer, therefore, has made a negative adjustment to those comparables that are considered to be in a higher construction completion stage than the subject. Conversely, a positive adjustment was made to those comparables which are in a lesser construction completion stage. Each comparable was adjusted accordingly.

### ***Number of Bed, living & reception rooms***

In the submarket where the subject property situated, the value of property increases in value in percentage terms when the number of bed rooms increases up to five then after the increase in value in percentage term starts to decrease. Unlike the bed room, the increase in value in percentage term decline when the living and reception rooms is more than one.

It is well known that both the plot and building/living area affects the value of a given property. Based on the valuer observation, preliminary trend and regression analysis of sales data, the value of a well developed property is more or less equally affected by land and improvement/building. Hence the valuer assumed that, by giving equal weight, the weighed area of the plot and building were considered to calculate the per square meter value of the properties.

### **Comparison Adjustment Results Table**

<b>COMPARISON ELEMENTS</b>	<b>Subject</b>	<b>Sale 1</b>	<b>Sale 2</b>	<b>Sale 3</b>	<b>Sale 4</b>
Sale Price		7,286,957	5,750,000	9,250,000	6,563,288
Sale Price per sq m		19,937	16,618	16,972	16,690
<b>Initial Adjustments;</b>					
Legal interest transferred	Leasehold	Leasehold	Leasehold	Leasehold	Leasehold
Adjustment	n/a	0	0	0	0
Special Financing Conditions	Cash	Cash	Cash	Cash	Cash
Adjustment	n/a	0	0	0	0
Date of Sale		May-15	Oct-14	Jan-15	Sep-14
Adjustment	n/a	0.16	0.25	0.21	0.26
Adjusted Price (Initial) Sub-total		23,127	20,773	20,537	21,030
<b>Other Adjustments</b>					
Location	N/a	Same	Inferior	Inferior	Same
Access to the land and depth	On main road	On main road	No paved road and 200 meter from the main road	No paved road and 400 meter from the main road	On main road
Adjustment	N/a	-0.1	0.05	0.1	0
Access to social services (education, recreation, hospital, transportation, fire protection & police etc)		Same	Same	Same	Same
Adjustment	N/a	0	0	0	0
Building Size	432	381	240	615	366.48

<b>COMPARISON ELEMENTS</b>	<b>Subject</b>	<b>Sale 1</b>	<b>Sale 2</b>	<b>Sale 3</b>	<b>Sale 4</b>
Adjustment	N/a	0.06	0.12	-0.11	0.08
Age/Condition		Same	Same	Same	Same
Adjustment	N/a	0	0	0	0
Quality of Construction	Very Good	Same	Superior	Inferior	Same
Adjustment	N/a	0	-0.1	0.1	0
Lot Size	388.75	350	452	475	420
Adjustment	N/a	0.02	-0.02	-0.02	-0.01
Number of Bed Rooms	4	5	3	6	4
Adjustment		-0.02	0.02	0.02	0
Living & guest room	1	1	1	2	1
Adjustment		0	0	0.02	0
Kind of Price	N/a	Asking price	Sold	Sold	Sold
Adjustment	N/a	-0.05	0	-0.05	0
Construction Completion Stage	N/a	Inferior	Superior	Superior	Superior
Adjustment	N/a	0.03	0	0	0
Total Adjustments	N/a	-0.06	0.07	0.06	0.07
<b>Adjusted Price per sq m</b>		<b>21,739</b>	<b>22,227</b>	<b>21,769</b>	<b>22,502</b>

<b>COMPARISON ELEMENTS</b>	<b>Subject</b>	<b>Sale 1</b>	<b>Sale 2</b>	<b>Sale 3</b>	<b>Sale 4</b>
<b>Average Price per sq m</b>		<b>22,059</b>			
<b>Market Value of Subject Property at New Condition</b>		<b>9,052,589</b>			

The average adjusted price of the subject is Birr22,059 per square meter. The market value of the subject property is estimated based on the average area of the plot and building  $((432+388.5)/2)$  which is Birr 9,052,589.

On the other hand if we take the least total adjustment (by ignoring the plus and minus sign), comparable no. 4 has lease weight. To this end the adjusted price of comparable no 4 is Birr 22,502 per square meter and the market value of the subject property is estimated to Birr 9,234,194.

## Income Approach examples

Example 1: suppose that an apartment house which has total number of units 25 is rented with different rent. The apartment type, number of units and their respected rents are given below:

Apartment Type	No of units	Monthly rent ( birr)
2-bedroom units	10	2,000
3-bedroom units	10	3,450
4-bedroom units	5	4,000

To calculate annual PGI, we can multiply number of rooms by \*(monthly rent)\*(12 months). Thus, owner of the apartment collect 240,000 from 2-bedroom units, 414,000 from 3-bedroom units and 240,000 from 4-bedroom units. the total annual rental income the property is birr 894, 000

Example 2: Suppose the EGI of the subject property is Birr 161,195. Based on the following table ,which provides a brief and simplified summary of annual operating expense incurred by owner of office building, calculate property's annual estimated net income and value of property given that capitalization rate is 10%.

Categories of operating expense	Amount of expense in birr
Insurance.....	8,300
Office Building Manager Salary.....	12,000
Water.....	3,000
Replacement for Building components.....	4,000
Parking Maintenance.....	1,200
Gas and Electricity.....	12,000
Building Maintenance.....	10,000
Real Property Tax .....	7,200
Replacement for roof and floor .....	6,000

We have Effective gross income of birr 161,805 and the above expenses. It is true that net operating income is the results of subtracting the above expenses from Effective gross income. So, there is a need to calculate the total expenses.

Categorizing the operating income into fixed, variable and replacement/reserve expenditure.

<b>Effective Gross Income .....</b>	<b>161,805</b>
<b>Fixed Expense</b>	
Real Property Tax .....	7,200
Insurance.....	8,300
<b>Total fixed expense (TFE)</b>	<b>15,500</b>
<b>Variable expenses</b>	
Office Building Manager Salary.....	12,000
Water.....	3,000
Gas and Electricity.....	12,000
Parking Maintenance.....	1,200
Building Maintenance.....	10,000
<b>Total variable expenses (TVE)</b>	<b>38,200</b>
<b>Replacement Allowance</b>	
Replacement for roof and floor.....	6,000
Replacement for Building components.....	4,000
<b>Total Replacement Allowance(TRA)</b>	<b>10,000</b>
<b>Total Operating Expense ( TFC+TVC+TRA)</b>	<b>63,700</b>
<b>NOI = ( EGI-TOE)</b>	<b>98,105</b>

**Property Value = Net Operating Income / Capitalization Rate**

$$98,105/0.1 = \text{Birr } 981,050$$

**Example 3:** A property sold for \$800,000 on a cash equivalent basis. The buyer's anticipated potential gross income is \$120,000. Anticipated vacancy and collection losses are 3% of anticipated potential gross income. Anticipated operating expenses, including anticipated property taxes, are \$40,000. The overall capitalization rate (R) derived from this transaction is as follows:

Anticipated potential gross income	\$120,000
Less: Anticipated vacancy and collection losses (3%)	3,600
Anticipated effective gross income	\$116,400
Less: Anticipated operating expenses (incl. ant. prop taxes)	40,000
Anticipated net incomes before a deduction for recapture	\$ 76,400
RO= Net Income/Sale price = \$76,400 / \$800,000	0.0955, or 9.55%

Example 4: Suppose that an apartment building that produces an NOI of \$27,000 want to be sale. Appraiser is informed to rely on recently completed transaction of comparable properties to obtain the overall capitalization rate to be used to value the subject property (an apartment building). The appraiser has found four comparable properties (recently sold) that are similar with the subject property. These properties are comparable to the subject property in terms of location, size, age, condition and intensity of land use. The appraiser has estimated the expected NOI from the current market rent and all appropriate expenses. The following table shows comparables sale price and their respected NOI.

Comparable	1	2	3	4
Sale Price	825,000.00	1,200,000.00	971,000.00	713,000.00
Net Operating Income	80,000.00	114,000.00	100,000.00	72,000.00
Implied Cap Rate	9.70	9.50	10.30	10.10
Average cape rate	9.90%			

Then the NOI of each comparable property is divided by its sales price to get the overall capitalization rate as indicated in the above table. As it shown in the above table the average of the four comparable capitalization rates ( $R_0$ ) is 9.90 percent.

Therefore by using the formula

$$\text{Capitalization Rate} = \frac{\text{Net Operating Income}}{\text{Market value}}$$

It is possible to calculate value the subject property

NOI of Subject	\$27,000
Capitalization rate	9.90%
Indicative value of Subject = NOI/Ro	272,727

Example 5: Suppose a property which was recently sold for 1,125,000 birr has a potential gross income of 180,000 birr and a vacancy and collection loss of 5% of the PGI. Determine the overall capitalization rate based on the EGM assuming that the operating expense is estimated to be 70,000 birr.

To calculate both the denominator and numerator we need to determine Net Operating Income/ Effective Gross Income. Based on the information EGI is equals PGI – 5% of PGI = 175,750 (185,000 – 9,250). NOI is equals to EGI-OE = 105,750 (175,750-70,000).

Now, we can calculate Net income ratio (NIR) and Effective Gross Income Multiplier

$$\text{NIR} = 105,750 / 175,750 = 0.60 \text{ and}$$

$$\text{EGIM} = \text{sale price}/\text{EGI} = 1,125,000/175,750 = 6.40$$

$$R_0 = \frac{0.6}{6.40} = 9.40\%$$

Therefore, overall capitalization rate extracted from the effective gross income multiplier of this property is 9.4%

Project 1: Read the following income capitalization method of valuation report carefully and give comments and suggestion on any contentious issue found in the report, if any.

## 1. Details of Income Approach Valuation Method

The Income Capitalization Approach is a method of converting the anticipated economic benefits of owning property into a value through the capitalization process. The principle of "anticipation" underlies this approach in that investors recognize the relationship between an asset's income and its value.

### 1.1 Market Rental Rates

In an effort to estimate the current market rent achievable for the subject's unit mix, the valuer surveyed several competitive commercial building complexes summarized as follows:

Based on our survey on five commercial properties, during the past 2 years, the properties near to the subject have indicated an average occupancy rate of 96.5 percent, 95 percent, 95.5 percent, 97 percent and 94 percent, respectively. The occupancy levels among the comparables vary from 92 percent to 98 percent with an average of 95.60 percent.

#### 1.1.1 Occupancy Rate of Comparables

Rental Comparables Commercial Properties	Occupancy Rate (%)		Two Years Average (%)
	2014	2015	
Rental Comparable No. 1	95.00	98.00	96.50
Rental Comparable No. 2	96.00	94.00	95.00
Rental Comparable No. 3	95.00	96.00	95.50
Rental Comparable No. 4	97.00	97.00	97.00
Rental Comparable No. 5	92.00	96.00	94.00
<b>Average</b>	<b>95.83</b>	<b>96.83</b>	<b>95.60</b>

The current rental values of these commercial properties are indicated below:

#### 1.1.2 Current Rental Prices of Comparables

S/N	Description	Rent (\$/m <sup>2</sup> ) in Comparable 1	Rent (\$/m <sup>2</sup> ) in Comparable 2	Rent (\$/m <sup>2</sup> ) in Comparable 3	Rent (\$/m <sup>2</sup> ) in Comparable 4	Rent (\$/m <sup>2</sup> ) in Comparable 5
1	Basement 1 Floor	6.95	6.48	6.95	6.95	6.95
2	Ground Floor	24.09	25.48	26.87	25.94	25.48

3	First & Second Floor	13.90	12.97	15.29	14.36	14.36
4	Third and Fourth Floor	12.04	11.58	12.51	12.97	12.97
5	Above Fifth Floor	10.19	9.73	11.58	11.12	9.73

Based on the available rental prices data for each floor in the sub market, the valuer estimated the weighted average rental price per square meter for each comparables. Then some adjustments have been made for location, building condition and facility, lease term, accessibility, tenant quality etc. in order to get the adjusted market rental value for the building which is being valued with Income Approach Valuation Method. The adjusted rental value for the subject property is \$12.42 per square meter per month.

### 1.1.3 Weighted Average Rental Prices for Each Comparables

S/N	Weighted Average Rental Prices/m <sup>2</sup>				
	Rental Comparable 1	Rental Comparable 2	Rental Comparable 3	Rental Comparable 4	Rental Comparable 5
1	12.51	11.62	14.22	13.74	12.12

### 1.1.4 Adjusted Rental Value

Comparison Elements	Subject	Comparable 1	Comparable 2	Comparable 3	Comparable 4	Comparable 5
Rent Price per Square Meter (\$)		12.51	11.62	14.22	13.74	12.12
Location	Good	Good	Good	Very Good	Very Good	Very Good
		0	0	-0.05	-0.05	-0.05
Accessibility (frontage)	Two Sides (Front and Right)	One Side (Front)	One Side (Front)	One Side (Front)	Two Sides (Front and Right)	Two Sides (Front and Right)
Adjustment	N/a	0.03	0.03	0.03	0	0
Building Condition	Very Good					
Adjustment	N/a	0	0	0	0	0
Building Facility	Good	Inferior	Inferior	Inferior	Inferior	Inferior
Adjustment		0.03	0.03	0.03	0.03	0.03
Lease Term	One Year and will be Extended					
Adjustment		0	0	0	0	0
Depth	Om main Road					
Adjustment		0	0	0	0	0
Tenant Quality	N/A	Good	Good	Very Good	Very Good	Very Good
Adjustment		0.05	0.05	0	0	0
Height of Building	G+15	G+10	G+10	G+8	G+7	G+10
Adjustment		-0.05	-0.05	-0.05	-0.05	-0.05
Total Adjustments		0.03	0.03	-0.07	-0.07	-0.07
<b>Adjusted Price (\$)</b>		<b>12.88</b>	<b>11.97</b>	<b>13.22</b>	<b>12.78</b>	<b>11.27</b>

Comparison Elements	Subject	Comparable 1	Comparable 2	Comparable 3	Comparable 4	Comparable 5
m <sup>2</sup>						
Average Price (\$) per m <sup>2</sup>		12.42				
Gross Internal Area (m <sup>2</sup> )		24,366				
Market Rental Value of Subject Property (\$) per Month		302,721				

Once the rental value per square meter is determined, the gross income of the property is estimated by multiplying the gross internal area by rental value per square meter, which is \$ \$302,721 per month.

## 1.2 Vacancy and Collection Loss

Both the investor and the appraiser are primarily interested in the annual revenue an income property is likely to produce over a specified period of time, rather than the income it could produce if it were always 100 percent occupied and all tenants were paying their rent in full and on time. A normally prudent practice is to expect some income loss as tenants vacate, fail to pay rent, or pay their rent late.

As indicated above the average occupancy rate of the comparables for the last two years was 95.60 percent while the lower and higher occupancy from the comparables were 92 percent and 98 percent, respectively. The valuer has been taking the average occupancy rate which is 95.6 to estimate the value of the subject property using the Income Approach Valuation Method. Collection loss should also be considered. As a result, the value has incorporated an overall 5.4 percent of the gross income vacancy and collection loss factor.

## 1.3 Operating Expenses

### 1.3.1 Land Lease Payment

The subject's land lease payment is about \$25,300 per year which is 0.70 percent of the gross income.

### 1.3.2 Utilities Expense

Tenants are fully responsible for these costs.

### 1.3.3 Insurance Expense

This cost belongs to the property owner, and it is about 0.075 percent of the building construction cost, which was about \$ 12,556 per year or 0.35 percent of the gross income.

#### **1.3.4 Repairs & Maintenance Expense**

This expense covers painting and general maintenance of the commercial building and common areas. Given that the building will be new construction, it is calculated at 2 percent of the gross income, which was \$72,653.

#### **1.3.5 Management Expense**

This is an all-inclusive expense category including rent collection, legal fees, promotion, accounting, and miscellaneous items. Market participants typically calculate this expense at 3 percent of gross income, which was \$108,979.

#### **1.3.6 Expense Conclusion**

From the above, it is clearly observed that the total operating expense was 6.05 percent of the gross income of the property.

### **1.4 Yield on Investment/Capitalization Rate**

The other factor for income approach valuation method is yield on investment or capitalization rate. The yield reflects all the risk factors associated with the buildings under consideration. The simplest form of yield (Initial Yield) is simply calculated by dividing the net annual rental income by comparable market value of the property or sometimes it is the rate of return required by investors. Once the yield on investment is determined, the Years of Purchase (YP) can be obtained from table or can be calculated by using the following formula:

$$YP = \frac{100}{Yield}$$

As per the consultant assessment, the rate of return (yield) required by investors for property investment ranges from 8 percent to 15 percent. On the other hand survey conducted by access capital about yield on investment revealed that yield varies from 5.6 percent for smaller buildings to 8.3 percent for larger buildings. Currently the bank lending rate for Commercial Bank of Ethiopia is about 9.5 percent and the valuer assumed that the yield should not be lower than the bank lending rate, though the capital value of the property will be increased as time goes on. Based on the above data the valuer assumed that the yield on investment for the subject property was 12 percent and the YP became 8.33.

### **1.5 Value of Property Using Income Approach Valuation Method**

The value of the property using Income Approach Valuation Method was estimated in the following table:

**1.5.1 : Value of Building Using Income Approach Valuation Method**

<b>Description</b>	<b>Gross Rentable Internal Area m2</b>	<b>Adjusted Rent (\$) per m<sup>2</sup> per month</b>	<b>Total Adjusted Rent (\$)</b>
Net Internal Area of the Building	24,366	12.42	302,721
Number of months per year			12
Total Gross Rent per year			3,632,648
Less Annual Out Going @ 11.45% of Gross Rents			415,938
Total Net Rent per year			3,216,710
Years of Purchase for a Yield of 12%			8.33
Income Approach Method Value			<b>26,805,913</b>
Investment to complete the existing construction for commercial purpose			<b>7,063,105</b>
<b>Estimated Property Value (\$)</b>			<b>19,742,808</b>

## **Plant & Machinery**

**Exercise 1:** Replacement estimated by using the proper level of current cost as the starting point.

The client has recently built a modern steam generation facilities total rated capacity of 80,000 pounds per hour.

- Construction of the new plant was completed three years ago.
- The historical cost of the new refinery's boilers, including all peripherals, was Birr 1,500,000 (3 years ago).
- The trend factor is 10% per year.
- Assume the following: The purpose of the appraisal is for financial reporting purposes to determine whether the assessed value is fair and reasonable

Begin by analyzing the available facts:

What is the appropriate current cost new to be used in the cost approach?"

### **Answer**

That cost would be calculated by multiplying the historical cost (three years ago) of Birr 1,500,000 by a trend factor of 1.331 ( $1.10 \times 1.10 \times 1.10$ ) to bring the historical cost of the modern replacement asset to the current date; thus, birr 1,500,000  $\times$  1.331 = birr 1,996,500. Therefore, in this example, the proper level of current cost would be a replacement cost new of birr **1,996,500**.

## Exercise 2:

### Illustrate the direct cost method of estimating a property's cost new

Cost of a machine currently in production.

- The subject to be appraised is a MMM Company engine lathe, model A, size 16" × 30" center-to-center.
- The serial number is 1234 and a serial number guide indicates that the machine was built in 2000.
- The current cost new of the lathe at the MMM Company's factory is \$50,500 including the cost of the motor and controls.
- The subject includes an XY taper attachment; the current cost of the taper Attachment at the MMM Company's factory is \$1,500.
- The current cost of freight to the subject site is estimated to be \$1,800.
- The current cost of installation is estimated to be \$3,200.
- The current cost of sales taxes is estimated to be \$2,800 and are determined to be applicable in this case
- Depreciation or obsolescence is to be ignored for purposes of this calculation

### Answer

The cost new installed of the MMM Company Model A engine lathe can be estimated as shown in

Current Cost of MMM Company Model A engine lathe	\$50,500
Add current cost of taper attachment	<u>\$1,500</u>
Total Current Cost New at the Manufacturer's Factory	\$52,000
Add installation labor	\$3,200
Add freight	\$1,800
Add sales taxes	<u>\$2,800</u>
<b>Total Current Cost New, Installed</b>	<b>\$59,800</b>

**Exercise 3: Cost-to-capacity**

Assume that it is known that the cost new of an ethylene plant with a capacity of 100,000 tons per year is \$16,000,000 and what is needed is the estimate of the cost of a plant with a capacity of 200,000 tons per year.

Solution — Using a 0.6 factor (for illustration purposes only):

The formula is:

$$C2/C1 = (Q2/Q1)^{0.6}$$

Where:

C2 = Desired cost of capacity Q2

C = 1 Known cost of capacity Q1

X = Cost-capacity factor

**Solution**

$$C2 = \$16,000,000 (200,000/100,000)^{0.6} = \$24,251,465$$