Real Estate Appraisal
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Estimating Accrued Depreciation Using the Breakdown Method

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This handout provides an overview of the steps involved in estimating accrued depreciation using the breakdown method.

1) Estimate the reproduction cost of each of the physical components in the building. These items are then classified as short- or long-lived items.

   Consider a 30,000 sf office-warehouse property with the following reproduction cost new. All of the costs below include an allocation for indirect costs and entrepreneurial profit attributable to the building. Note that I have broken them down by short-lived and long-lived components:

Building Component	Long-lived	Short-lived	Total cost
Excavation and site prep	$9,600		$9,600
Frame	97,500		97,500
Floor structure	67,200		67,200
Floor cover, office		$3,850	3,850
Ceiling, office		13,500	13,500
Partitions, office	36,000		36,000
Sprinkler	40,500		40,500
HVAC, warehouse		21,950	21,950
HVAC, office		11,700	11,700
Plumbing	40,700	6,500	47,200
Electrical	38,700	14,300	53,000
Exterior wall	93,000		93,000
Roof cover		25,000	25,000
Roof structure	40,000		40,000
Total	$485,150	$74,850	$560,000

   Recall that all of these component costs include indirect costs and entrepreneurial profit.

2) Determine the cost of curing any deferred maintenance items (curable physical deterioration).

   There are two items of deferred maintenance with this building: storm damage to the roof and space heaters in the warehouse that need to be replaced.

Building Component	Cost new	Cost to cure	Remainder
HVAC, warehouse	$21,950	$23,500	$0
Roof cover	25,000	3,500	21,500
Total		$27,000	

NOTE: Generally speaking deferred maintenance will relate to short-lived building components. It is possible, however, that some long-lived component may have some curable physical deterioration. Make sure you calculate the cost of cure for both long- and short-lived deferred maintenance.

3) Estimate the impact of remaining physical deterioration of short-lived items (incurable physical deterioration).

Here we take the cost new of each of the short-lived items and subtract off the amount spent to cure the item. The logic behind this is that we have already calculated the cost of the portion that was curable, so we now only need to calculate the cost of the incurable portion of the item.

Building Component	Cost	Age	Life	Dep. %	Depreciation
Floor cover, office	$3,850	2	8	25	$962
Ceiling, office	13,500	10	20	50	6,750
HVAC, warehouse	0	n/a	n/a	n/a	0
HVAC, office	11,700	10	15	67	7,839
Plumbing	6,500	10	20	50	3,250
Electrical	14,300	8	15	53	7,579
Roof cover	21,500	10	15	67	14,405
Total	$71,350				$40,785

Notice that there is no depreciation for the HVAC in the warehouse. This is because we have already calculated the depreciation for that component by replacing the space heaters (the $23,500 cost above).

In addition, we only depreciated the roof cover based off a $21,500 replacement cost, not the actual cost of $25,000. Once again, this is to avoid double counting; the cost associated with the repair ($3,500) brings that piece of the roof cover to a "like-new" state, so only the remaining cost is depreciated.

4) Estimate the impact of physical deterioration of long-lived items.

First we must estimate the replacement cost of the remaining long-lived items after curing any deferred maintenance. This is simply the total cost of the building, minus the cost of curing deferred maintenance, minus the cost of incurable short-lived items.

Replacement cost new		$560,000
Less		
Deferred maintenance	27,000	
Incurable short-lived items	71,350	91,350
Total, long-lived items		$468,650

Notice that we subtract off the *adjusted* cost of the short-lived items, or only the *incurable* portion of these items. This is because we have already subtracted off the curable portion (the deferred maintenance).

The calculation of physical deterioration of long-lived components is then straightforward:

Replacement cost of long-lived items		$468,650
Effective age	8 years	
Remaining useful life[1]	42 years	
Depreciation percentage	16%	
Long-lived physical deterioration		$74,984

5) Estimate the cost of curable functional obsolescence.

a) *Deficiencies* are items or features that are missing and would be required by the market. In this example, suppose that the subject property suffers from not having a truck-height loading dock.

The loss from a deficiency is measured as the difference the cost of installing the item today compared to what it would have cost to install it in the first place.

Cost to install today	$4,500
Cost to install in original structure	2,500
Loss in value due to deficiency	$2,000

b) *Defects* are items that are present but do not meet modern standards. An example might be a classroom with tiered seating with chairs bolted to the floor. Perhaps the new style in classrooms is modular tables that can be moved around for group work. The loss in value due to a defect is the cost of the item less the *undepreciated* cost of the existing item. The idea behind subtracting off the undepreciated portion of the item is that you have already subtracted off from the cost due to physical deterioration of the component.

Using the example above, suppose that the old seating and tables cost $45,000 new and that 20 percent of their useful life has been used. Suppose that a seating system in the new style would cost $65,000 to install. Then the value loss associated with this functional obsolescence would be:

Cost to cure	$65,000
Undepreciated cost of existing item	36,000
Loss in value due to defect	$29,000

c) *Superadequacies* are features or components that are more expensive to install than the typical buyer in the market would be willing to pay given the utility it provides. In this example, suppose that the property has a brick veneer, which would exceed current market standards for this type of building.

There are two ways to estimate the loss in value associated with a superadequacy.

[1] Notice that this implies that the total economic life is 50 years.

- Excess cost adjustment method

Added cost associated with item	$40,000
Less depreciation already taken	6,400
Loss in value due to superadequacy	$33,600

  Notice here that we need to subtract off the depreciation already taken on the exterior wall so that we don't double count. In this case, we used the 16% depreciation percentage for the long-lived components, because the exterior wall is long-lived.

- Rent loss method

Rent psf needed to support item	$2.1000
Market rent	1.9500
Rent difference	$0.1500
Operating expense difference	0.0045
NOI difference per square foot	$0.1455
Market value of NOI difference (10.5% cap rate)	$41,571
Less depreciation already taken (16%)	6,651
Loss in value due to superadequacy	$34,920

6) Estimate the loss in value due to incurable functional obsolescence. This loss is calculated using the rent loss method described above.

   Assume that there is no functional obsolescence with this property.

7) Estimate the loss in value due to incurable external obsolescence. This also is calculated using the rent loss method. However, there are some modifications. First, note that the rent loss is now the difference between market rent for similar properties and the rent this property can command. Second, there is no need to subtract off for depreciation already taken because this associated with factors outside the property. Finally, the depreciation from external obsolescence is typically allocated between the land and the building.

Market rent psf	$1.950
Current rent	1.750
Rent difference	$0.200
Operating expense difference	0.006
NOI difference per square foot	$0.194
Market value of NOI difference (10.5% cap rate)	$55,429
Allocation to improvements (80%)	$44,343

8) Add up the total estimated depreciation and subtract it from the reproduction cost new. Then add in the value of the land to get the indicated value of the subject using the cost approach.

Reproduction cost new			$560,000
Less accrued depreciation			
Physical deterioration			
Curable, deferred maintenance	27,000		
Incurable, short-lived items	40,785		
Incurable, long-lived items	74,984	142,769	
Functional obsolescence			
Curable	2,000		
Incurable	33,600	35,600	
External obsolescence		44,343	
Total accrued depreciation			222,712
Depreciated value of improvements			$337,288
Contributing value of site improvements			15,000
Land value			65,000
Fee simple value indication			$417,288