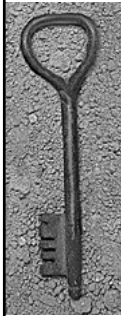


## Chapter 12



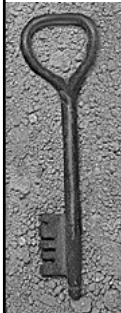
### Value Theory, Highest and Best Use Analysis, and the Cost Approach



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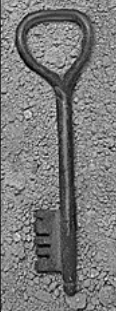
### Introduction to Value Determination

- ◆ Price is usually factual in nature
- ◆ Value concepts always theoretical in nature
  - ◆ Value by nature is an opinion
  - ◆ In the absence of a perfectly competitive market, there can be no certainty that the value sought is resolutely true or unchallengeable
- ◆ Cost is also factual in nature

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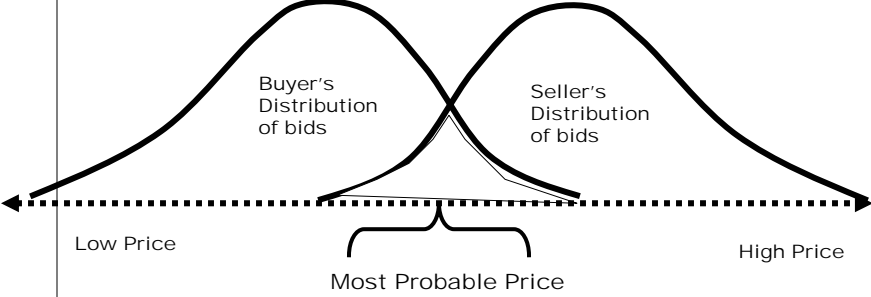
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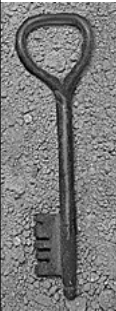


## Price and Value Formation

- ◆ The shaded area is where actual transactions will occur and market prices will be formed through negotiation
- ◆ The distributions of buyers and sellers need not be equal in size



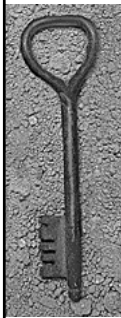
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## Traditional Methods of Valuation

- ◆ **Cost Approach**  
Compare subject property to the cost to build new, less accrued depreciation for wear and tear and obsolescence plus the value of the site at highest and best use
- ◆ **Market or Sales Comparison**  
Compare the subject property being appraised to similar comparable properties or "comps" that have sold recently or near the date of the appraisal
- ◆ **Income Approach**  
Discount future benefits to own the subject property using stabilized Net Operating Income, NOI and a capitalization rate, R. Value, as  $V = NOI/R$

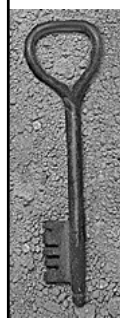
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## Newer Methods of Valuation

- ◆ Statistical approaches based on multiple factor regression models with larger samples
  - ◆ Essentially a variation on the market/ sales comparison approach to value
- ◆ Requires a large sample of similar property
  - ◆ Samples are often selected using a combination of geographic distance as well as key attribute ranges such as size
  - ◆ Here the dependent variable is sales price
  - ◆ The dependent variables are the quantity or quality attributes

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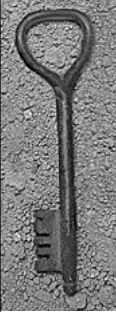
## Newer Methods of Valuation

- ◆ A typical model may look like:

$$\text{Sales Price} = a + b_1(\text{Building size}) + b_2(\text{Lot size}) + b_3(\text{age}) + b_n(x) + \text{residual}$$

$b_i$  = regression coefficient  
 $x$  = independent variable of interest

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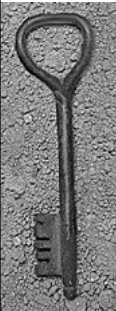


## Starting with Site Value Based on the Highest and Best Use

- ◆ **Definition of Highest and Best Use (H&B Use)**

“The reasonably probable and legal use of vacant land or improved property, which is physically possible, appropriately supported, financially feasible, and that results in the highest value” as of the date of the appraisal
- ◆ **Legal**
  - use refers to zoning laws, building codes and similar land use controls
- ◆ **Physically possible**
  - considers the slope of the land, subsoil, surrounding influences on construction methods, and current technology, materials and design

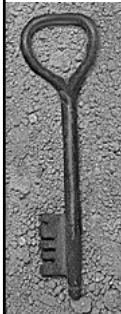
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## Highest and Best Use (Contd.)

- ◆ **Reasonably probable**
  - speculation should not be too far in the future
- ◆ **The creative element**
  - The analyst must be able to be creative enough to spot opportunities and trends that might produce higher site values
- ◆ **Financially feasible**
  - Recognize that the value of land is not limited to the value of its current use
  - The best use of the property may still be to hold it vacant, so as not to preclude future opportunities which will likely be much more productive

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## Another Look at the Impact of Option Value

### ◆ Option Value (Future Use Value)

- The value inherent in waiting for market conditions to ripen so that a much more intensive use of the site becomes feasible

### ◆ The total value of land includes an "option component" reflecting the value of the option to convert the land to a different use in the future

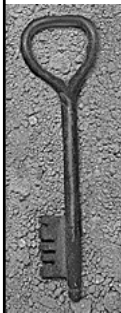
$$\text{Site Value} = \text{Current Use value} + \text{Future Use Value / Option Value}$$

- This option has
  - an infinite life
  - an exercise price equal to the cost of conversion to the new use

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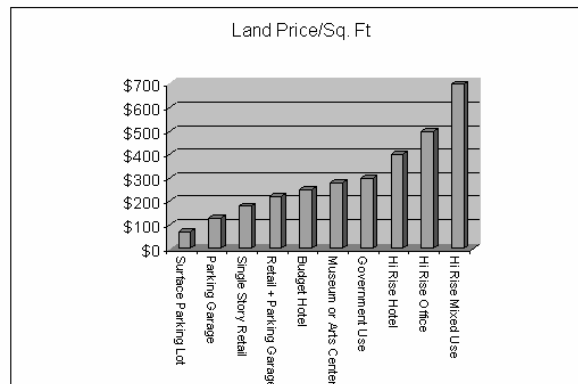
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## Option Value (Contd.)

Land Values per Square Foot with Various Uses

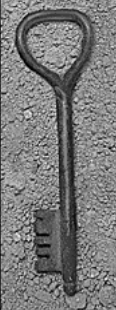


- ◆ The lowest improved site values shown above are surface parking lots, yet these sites are worth more than the current use value as they have the highest option value of any uses

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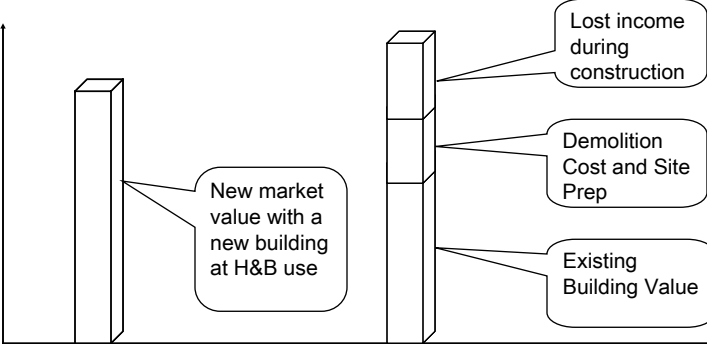
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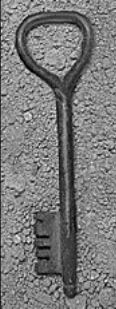


## Improved Site Value

- ◆ Most of the time the H&B use of a property is the current use
  - ◆ The cost of construction and demolition being higher than the cost of construction plus the opportunity cost of time for the conversion



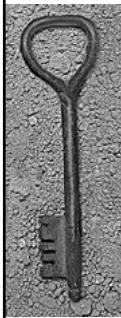
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## Cost-Based Approach

- ◆ The cost approach presumes that value is inherent in the object itself
- ◆ Used by property insurance companies
- ◆ The most commonly used approach in less developed countries
  - ◆ reliable market and income data is difficult to find or non-existent
- ◆ It is the most misused approach
  - ◆ many appraisers simply tweak and fudge the process to match up with what they know are better indicators of value

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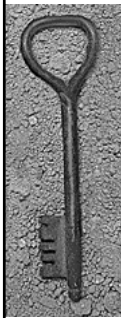
## The Cost Approach (Contd.)

More reliable when the property is at its highest and best use and nearly new (little depreciation)

Useful in setting an upper limit to value

- ◆ Steps:
  1. Estimate Land Value at H&B use
  2. Estimate the structure cost new
  3. Estimate the “lease-up” or “absorption” cost
  4. Deduct accrued depreciation

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## Steps in the Cost Approach to Value

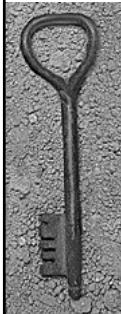
- ◆ Step 1: Estimate land value
 

In this step the land value or site acquisition cost value is estimated, based on the land as though vacant and available to be developed to its highest and best use

**The Cost Approach Illustrated**

	Subject	Comp 1	Comp 2	Comp 3
Selling Price		\$2,500,000	\$2,700,000	\$1,500,000
Date of sale	Current	3 mos. ago	12 mos. ago	24 mos. ago
Demolition Expense at the time of sale	None required	none	350,000	none
Site Preparation at the time of sale	None required	5,000	15,000	none
Adjusted Cost		2,505,000	3,065,000	1,500,000
Adjusted 4% per year compounded annually		2,530,050	3,187,600	\$1,622,400
Size in acres	200	250	300	160
		\$10,020.20	\$10,625.33	\$10,140
Conclusion of value	\$2,052,369			

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## Steps in the Cost Approach to Value

- ◆ Step 2: Estimate the structure cost new
  - The cost new may be estimated through one of two methodologies, solving for replacement or reproduction costs
    - To replace the subject property means to replace the function
    - To reproduce the subject property means to estimate the cost of an identical replica
    - Replacement cost is usually much easier to estimate than reproduction cost, and is more widely used in practice
  - Costs new will include hard costs (construction materials and labor) and soft costs (design costs, permits, financing, legal, leasing)
    - Soft costs often run 25% to 30% of the hard costs

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## Methods to Estimate Cost New

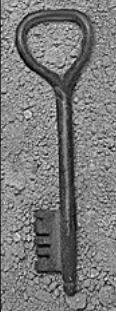
- ◆ Comparative-Unit Method:
  - ◆ Based on information about the actual construction cost of existing and recently-built buildings of various types and sizes, preferably in the local area
- ◆ Indexed Cost Update Method:
  - Original cost estimate is merely updated by examining construction cost trends in the local area per comparative unit (again usually square feet) with an inflation style index
  - Only feasible when the subject property is fairly new (less than 10 years)

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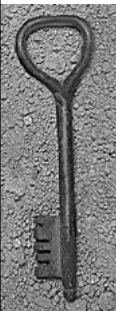




## Methods to Estimate Cost New (Contd.)

- ◆ **Unit-in-place Method:**
  - Develops typical "in-place" (i.e., installed) costs is a building component approach
  - Each component is a major part of the building such as excavation, foundation, walls, doors, windows, electrical, plumbing, HVAC, roofing etc.
- ◆ **Quantity Survey Method:**
  - Most detailed analysis of all
  - Requires that all materials and labor required for the subject property be explicitly specified and estimated as if bidding to build the structure from scratch

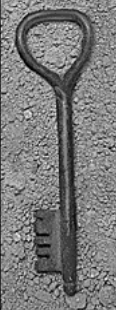
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## The Steps in the Cost Approach to Value (Contd.)

- ◆ **Step 3: Estimate "lease-up" or "absorption" costs necessary to bring a new building up to normal levels of occupancy and use**
  - Costs associated with this phase may also included leasing commissions (~ 6% of the gross lease over the initial term of the lease) and cost of tenant improvements for specific tenants
  - These costs can be a substantial fraction of the construction cost
    - often in excess of 10 percent
    - added to the cost new in Step 2 and the land value in Step 1 to derive a fully operational cost new estimate

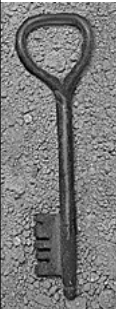
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## Steps in the Cost Approach to Value (Contd.)

- ◆ Step 4: Deduct Accrued Depreciation
  1. Physical:
    - Wear and tear is usually based on age and obvious signs of unusual wear or required repairs
    - The age of the subject property as a percentage of the total economic life of such property is applied to the cost new for the estimate of physical accrued depreciation
  2. Functional:
    - Depreciation is caused by outdated functional design or a lack of certain equipment
    - A poor layout or lack of essential modern equipment requires an additional deduction for building obsolescence

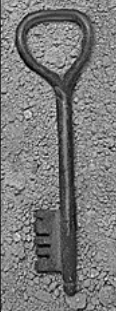
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## The Steps in the Cost Approach to Value (Contd.)

- ◆ Step 4: Deduct accrued Depreciation (Contd.)
  3. Location or External:
    - Over-improvement for the local market
    - Unfavorable market conditions
    - Environmental quality
    - Decline in the perceived quality of the neighborhood
    - Property values may also decline with no internal or external physical or functional changes at all

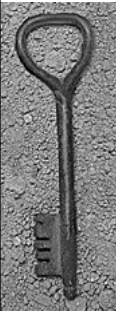
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## The Steps in the Cost Approach to Value (Contd.)

- ◆ Curable Defects
  - A source of depreciation is considered "curable" if it is economically feasible to replace the depreciated item with a new and modern substitute
  - Physical and functional depreciation may be treated at least to some extent by the property owner
  - External depreciation hard to cure

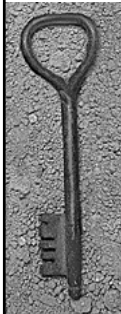
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## Negative Value of Incurable Depreciation

- ◆ Three Variables:
  - Reproduction or replacement cost new of the depreciated component
  - "Effective Age" of the component: appraiser's judgment as to how much longer the component is likely to remain in service before replacement
  - "Total Economic Life" of the component: how long the component would normally be expected to remain in service before either physical or functional deterioration warrants replacement

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## Negative Value of Incurable Depreciation

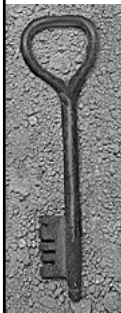
$$\text{Accrued Depreciation} = \frac{(\text{Cost New}) * (\text{Effective Age})}{\text{Total Economic Life}}$$

- ◆ Curable items are added to the incurable items to determine the total of accrued depreciation
- ◆ In this last step in the cost valuation procedure, the appraiser simply subtracts the total accrued depreciation value estimated from the replacement (or reproduction) cost new value estimate to arrive at the cost-based estimate of the subject property's current value

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## A Simple Example

You are appraising a warehouse that is 5 years old and seems to have an effective age of 5 years.

The economic life on similar warehouses is 30 years.

The warehouse covers 100,000 square feet sitting on a lot of 200,000 square feet.

Similar sites cost \$6 per square foot for clean land, \$3 per square foot for site preparation and paving.

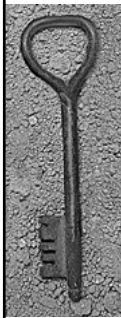
Similar buildings cost \$40 per square foot new including hard costs, soft costs and normal fees.

What is the value via the cost approach ignoring functional obsolescence and assuming no external depreciation and assuming that such a warehouse is pre-leased prior to construction?

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## A Simple Example (Contd.)

Site Value = 200,000 \* (\$9)  
                   for land plus prep  
                   = \$1,800,000

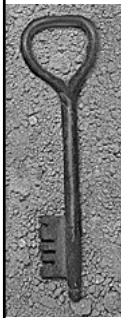
Cost New = 100,000 \* \$40  
                   = \$4,000,000

Accrued Depreciation  
                   = 5/30 \* \$4,000,000  
                   = (666,667)

Value = \$5,133,333

Q: What if the technological changes in warehousing had made the existing warehouse obsolete for modern users, and effectively increased its economic life to 20 years?

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## A Simple Example (Contd.)

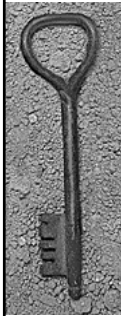
Effective Age = 20 years

Accrued Depreciation  
                   = 20/30 \* \$4,000,000  
                   = (2,666,667)

Value = \$3,133,333

- ◆ There are more complex methods of estimating accrued depreciation
  - ◆ The Component Breakdown Method considers the wear and tear and remaining life of each components
    - ◆ similar to the unit in place (component) method for cost new

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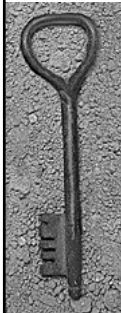
## Another Example

Assume once again a 100,000 square foot warehouse that is 5 years old. The economic life is 30 years. It sits on 150,000 square feet of land, enough for truck turns and docking and with some parking. It is multi-tenant and set up for several different tenants. There is enough parking for 100 cars in addition to 10 truck docking doors. There is not enough land for more parking but there is a raw land parcel next door that could be purchased and prepped for \$10 per square foot. The current level of parking required for more labor intensive retail distribution firms suggests enough parking be added for 50 more cars. This means 11,250 more paved area at a finished cost of \$12 per square foot or \$135,000 dollars beyond the land cost. Without the additional parking half the building will remain vacant. Economic life on similar bulk warehouses is 30 years. Warehouse has 32 foot ceilings. Similar buildings cost \$50 per square foot new including hard costs, soft costs and normal fees. Lease up costs estimated to require \$60,000 in commissions/ marketing; \$50,000 in capital carry costs.

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## Another Example (Contd.)

What is the value via the cost approach and considering the extra parking required?

$$\begin{aligned}\text{Cost new of Land} &= 150,000 * (\$10) \\ &= \$1,500,000\end{aligned}$$

$$\begin{aligned}\text{Cost New of Bldg.} &= 100,000 * \$50 \\ &= \$5,000,000\end{aligned}$$

$$\begin{aligned}\text{Accrued Depreciation} \\ &= 5/30 * \$5,000,000 \\ &= (833,333)\end{aligned}$$

$$\begin{aligned}\text{Lease Up and Carry Cost} \\ &= \$110,000\end{aligned}$$

$$\text{Net Cost New} = \$5,776,667$$

Could we stop here?

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Thank  
Thank  
You!  
THANK  
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Thank You

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