Asset Valuation

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Investment Recovery Exchange

OR

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Introduction

True genius resides in the capacity for evaluation of uncertain…and conflicting information. *Winston Churchill*

Generally, an appraisal estimates the monetary worth of property, goods and services. In its *Principles of Appraisal Practice and Code of Ethics, 2001,* the American Society of Appraisers (ASA) broadened the definition to include the following:

- Determination of property value
- Cost estimation of: (a) producing a new property, (b) replacing an existing property by purchasing or producing an equivalent property, or (c) reproducing an existing property by purchasing or producing an identical property
- Determination of the non-monetary benefits or characteristics that contribute to value; rendering judgments as to age, remaining life, condition, quality or authenticity of physical property
- Forecast of the property's earning power

Introduction (cont'd)

Simply put, an appraisal is an unbiased opinion of value or other physical attribute of an identified property *on a specific date.*

Appraisals are made by:

- Defining the problem
- Assembling pertinent data
- Gathering market research (from both new and used markets)
- Applying knowledge and appropriate appraisal techniques
- Possessing the experience and judgment to reach an appraisal conclusion

The Purpose for an Appraisal

Appraisals can be used for many purposes, among others,

- Property sale
- Insurance coverage
- Property tax appeals
- Equipment leases

Each intended purpose has a specific, related value concept. It's important that the appraiser clearly understand the value concepts used for each appraisal type.

Definitions of Value

1. **Reproduction Cost New** is the current cost of using the same or closely similar materials to produce a new replica of a property.

2. **Replacement Cost New** is the current cost to purchase a similar new property having the nearest equivalent utility to the property being appraised.

   These first two definitions refer to *new* costs. The **reproduction cost** refers to the cost of an *exact* replica, whereas the **replacement cost** refers to the cost of an asset with equal or similar utility. This distinction most often occurs when there are differences in technology.

Definitions of Value (Cont'd)

3. **Fair Market Value** is the estimated amount, expressed in terms of money, that may be reasonably expected for a property in an exchange between a willing buyer and a willing seller, with equity to both, neither under any compulsion to buy or sell, and both fully aware of all relevant facts, as of a specific date.

4. **Fair Market Value in Continued Use** is the estimated amount, expressed in terms of money, that may reasonably be expected for a property in an exchange between a willing buyer and a willing seller, with equity to both, neither under any compulsion to buy or sell, and both fully aware of all relevant facts, *including installation, as of a specific date, and assuming that the earnings support the value reported*.

5. **Fair Market Value Installed** is the estimated amount, expressed in terms of money, that may reasonably be expected for an installed property in an exchange between a willing buyer and a willing seller, with equity to both, neither under any compulsion to buy or sell, and both fully aware of all relevant facts, *including installation, as of a specific date*.

DEFINITIONS OF VALUE (Cont'd)

6. **Fair Market Value Removed** is the estimated dollar amount the company can expect to be paid for a property, *considering that the property must be moved to another location*.

7. **Liquidation Value in Place** is the estimated gross dollar amount the company projects it can obtain from a failed facility, assuming that the *entire facility would be sold intact within a limited time and as of a specific date*.

8. **Orderly Liquidation Value** is the estimated gross dollar amount the company could typically realize from a sale as of a specific date, *given a reasonable period of time to find a purchaser, and with the seller being compelled to sell on an as-is/where-is basis*.

9. **Forced Liquidation Value** is the estimated gross dollar amount the company could typically realize from a properly advertised and conducted public sale. Under this valuation, *the seller must sell as of a specific date on an as-is/where-is basis*.

Definitions of Value (Cont'd)

10. **Salvage Value** is the estimated dollar amount the company may expect for the whole property or for a *component of the whole property* that is retired from useful service.

11. **Scrap Value** is the estimated dollar amount the company could realize for the property if it were sold for its *material content* rather than for a productive use.

12. **Insurance Replacement Cost** is the cost to *replace a specific property with a similar new property as defined in the insurance policy* less the cost new of any items specifically excluded in the policy.

13. **Insurance Value Depreciated** is the *insurance replacement cost, as of a specific date, less accrued depreciation* considered for insurance purposes.

Valuation Process

The valuation process includes:

Define the problem and proper value definition
- Identify the property, collect and analyze data
- Reach a value conclusion

To properly produce any appraisal the appraiser needs to be fully aware of the problem at hand.
- Why is the appraisal needed?
- How will it be used?
- What is the property?
- Is the appraisal date current or at some point in the past?
- Do unusual circumstances surround the appraisal?

Once these questions have satisfactory answers the appraiser can properly choose the value concept and value definition for the assignment.

Value Hierarchy

The hierarchy of value is *usually* as follows:

1. Reproduction cost new (Typically highest)
2. Replacement cost new
3. Fair market value in continued use
4. Fair market value installed
5. Fair market value removal
6. Liquidation value in place
7. Orderly liquidation value
8. Forced liquidation value
9. Salvage value
10. Scrap value (Probably lowest)

Condition Codes

Symbol	Condition	Definition
N	New	Not used before; no loss in value due to physical deterioration
E	Excellent	Near-new condition; very little use, recently purchased
VG	Very Good	Exceptionally good mechanical condition; may have been overhauled or may not have been used enough to require an overhaul.
G	Good	In good operating condition; may require replacement or repair due to working parts; no known mechanical defects.
F	Fair	May require overhaul soon; has seen lots of service and may be old or suffered hard use.
P	Poor	Is worn and requires major repairs or replacements.
S	Salvage	Value in unit components as reusable or spare parts; little value.
X	Scrap	No longer serviceable and no value other than for material content

Age/Life Method of Physical Depreciation

Normal useful life, physical (NUL) is the life, usually in terms of years, that an asset will endure before it deteriorates to an unusable condition. NUL is derived from mortality data and from studying specific assets under actual operating conditions.

Economic useful life (EUL) is the estimated time period over which it is anticipated an asset may be profitably used for its intended purpose. This time span may be limited by changing factors of obsolescence and physical age.

Chronological age (CA) is the number of years elapsed since the property was built.

Effective age (EA) is an asset's estimated age in comparison with a new asset of like kind. EA often is calculated by deducting the asset's remaining useful life from the normal useful life.

Estimated remaining useful life (RUL) is the period over which an item or groups of items will remain in use.

Age/Life Application

- **An arithmetical calculation of physical deterioration. This would be used in place of observation method.**

$$\frac{\text{Age}}{\text{Life}} = \text{Depreciation}$$

- **In simple terms, the above formula may be interpreted to mean chronological age divided by normal useful life equals the percentage of depreciation.**

Age/Life Application (cont'd)

- **The previous formula may also be restated to represent the following:**

$$\frac{EA}{NUL} \;=\; \frac{EA}{EA + RUL} \;=\; Percent\ depreciation.$$

The components of this formula may be stated as follows:

Normal useful life = Effective age + Remaining useful life

NUL = EA + RUL **or by transposition** *NUL − RUL = EA*
or
NUL − EA = RUL

Data Collection

Data generally are collected on the subject assets as well as on comparable sales of both new and used assets. Data on the subject assets typically include the elements of identification.

When the asset listing is complete the appraiser begins researching the marketplace for both new and used cost data.

- For *new cost* data, the appraiser may wish to contact the **manufacturer** directly or gather information from **distributor catalogs, trade journals or the internet**.

- The appraiser should also search for used value data. Good relationships with used **brokers and dealers** can lead to information on actual sales. Otherwise many brokers/dealers advertise in **industry periodicals**, the *Yellow Pages* and on the **Internet**. Published reference materials for used equipment include *Orion Blue Books* (computers and copiers), *Daley Marketing* (computers) and *Kelley Blue Book* (automobiles). Sales data from **auction web sites** is a another good source of data.

Approaches to Value

- **Principle of Substitution:** The cost approach in appraisal analysis is based on the proposition that an informed purchaser would pay no more for an asset than the cost of producing a substitute with the same utility as the subject asset.

- This basic principle is a foundation of the cost approach and needs to be understood as each of the approaches are to be discussed.

- The approaches are: **Cost, Sales Comparison and Income.**

Approaches to Value

Cost Approach:

The **cost approach** is based on the assumption that the reproduction and/or replacement cost new normally sets the upper limit of value. The first step, therefore, is to develop the estimated replacement or reproduction cost new.

Since the subject assets are not in new condition, some accrued depreciation needs to be deducted to arrive at value.

- **Physical depreciation** (loss in value due to wear and tear and age),
- **Functional obsolescence** (loss in value due to factors inherent in the asset itself, such as changes in design or technology)
- **Economic obsolescence** (loss in value due to external factors, such as governmental regulations, the asset's utilization or profitability and/or reduced demand for the products the asset produces).

Approaches to Value

Sales Comparison Approach:

The **sales comparison approach** relies on the assumption that in the used market the selling or asking prices of similar assets can measure the subject assets' value, either individually or collectively.

- **Exact Match** - is market sales of assets exactly like the subject.
- **Comparable Match** - similar assets can be utilized and adjusted for the differences.
- **Adjustments include**:
  - Age
  - Condition
  - Capacity
  - Location
  - Date and type of sale

Approaches to Value

Income Approach:

The **income approach** requires that the subject assets' earning capacity be investigated and that the indication of expected capacity, whether derived from a past, current or projected earnings stream, be capitalized at a rate sufficient to satisfy the investment requirements of ownership. *This approach is seldom used for individual pieces of machinery, because it is difficult to assign income to any particular fixed asset.*

Cost Approach

In appraisal analysis the cost approach is based upon the proposition that an informed purchaser would pay no more for an asset than the cost of producing a substitute with the same utility. This concept is also known as the **principle of substitution**.

The cost approach assumes that an asset's maximum value to a knowledgeable buyer is the amount required to purchase or construct a new asset of equal utility. When the asset is used, the current cost new must be adjusted for all depreciation attributable to the asset on the appraisal date.

In its simplest form, the cost approach can be represented as:

Cost New – Depreciation = Value

Cost Approach (cont'd)

The appraiser should remember that when appraising for insurance purposes or for any of the *in use* values, replacement cost new should include all direct and indirect attachments and installation costs.

Direct installation costs include costs directly applicable to the individual assets, such as freight, rigging and moving, electrical hookups, foundations, piping, millwrighting, labor for erection and sales tax, if applicable.

Indirect installation costs are typically spread throughout an entire construction project, such as engineering and design, licenses and permits, temporary insurance, security, and typical finance charges during construction.

Cost Approach (cont'd)

REPRODUCTION COST NEW
Less
<u>EXCESS CAPITAL COST</u>
REPLACEMENT COST NEW
Less
PHYSICAL DEPRECIATION
Less
FUNCTIONAL OBSOLESCENCE
Less
<u>ECONOMIC OBSOLESCENCE</u>
FAIR MARKET VALUE
(by the Cost Approach)

Cost Approach (cont'd)

Suppose the appraiser discovers that the replacement cost new of the subject machine is $25,000. Sales tax is six percent, freight is $500, attachments are $2,500, concrete foundations are $1,000 and installation cost is $1,200.

RCN Removed		**RCN Continued Use**	
RCN of Machine	$25,000	RCN of Machine	$25,000
RCN of Attachments	$ 2,500	RCN of Attachments	$ 2,500
Total RCN	$27,500	Sales Tax @ 6%	$ 1,650
		Freight	$ 500
		Foundations	$ 1,000
		Installation	$ 1,200
		Total RCN	$ 31,850

Cost Approach (cont'd)

Depreciation is usually taken in the order it occurs: physical deterioration, then functional obsolescence and finally economic obsolescence.

- Assume that for the previous problem the appraiser has described the asset as being in fair condition.

- This description indicates that about one half of its normal life has deteriorated.

- The appraiser also has determined that the new replacement model is approximately 10 percent more efficient than the subject asset.

- Current management has inefficiently utilized the asset by a function of approximately 25 percent.

Cost Approach (cont'd)

What is the estimated FMV-CU ?

RCN Installed	$31,850
Physical depreciation (50%)	<u>-15,925</u>
RCN less physical depreciation	$15,925
Functional depreciation (10%)	<u>- 1,593</u>
RCN less physical & functional	$14,332
Economic depreciation (25%)	<u>- 3,583</u>
FMV –CU	$10,749
Rounded	$10,750

Cost Approach (cont'd)

What is the estimated FMV-R ?

RCN Installed	**$27,500**
Physical depreciation (50%)	**-13,750**
RCN less physical depreciation	**$13,750**
Functional depreciation (10%)	**- 1,375**
RCN less physical & functional	**$12,375**
Economic depreciation (0%)	
FMV – R	**$12,375**

Note: There is no economic obsolescence since the inefficiencies caused by the current owner's use would not necessarily be applicable if the asset were removed from the facility.

Sales Comparison Approach

The sales comparison approach, or market approach, involves collecting market data about the subject assets.

This approach determines the assets' desirability, arriving at the most probable selling price by analyzing recent sales or current market offerings of similar assets. If the comparable assets aren't adequately similar to the subject assets, the appraiser must adjust the comparative sales accordingly. For example, adjustments sometimes can be made for age, condition, capacity, model and other factors.

In its simplest form, the sales comparison approach is:

Comparable Sale +/- Adjustments = Value

Sales Comparison Approach (cont'd)

In the sales comparison approach, appraisers use various techniques, including:

Direct match technique - establishes value based on a direct match of the subject to an identical asset. An example might be the cost data for a forklift of exact make, model, age, capacity and condition. Often pricing guides are used for direct matches.

Comparable match technique - establishes value based on analysis of similar (but not identical) assets using some measure of utility (size, capacity, etc.) for comparison. For example, if an appraiser can't find a comparable sale for an engine lathe manufactured by Company A but finds sales of same size and condition lathes manufactured by Companies B and C, those sales can be used for comparison.   However, those sales must be adjusted for any differences from the subject assets.

Percent of cost technique - establishes the ratio between used selling price and the property's current cost new at the time of sale. With sufficient data the appraiser may be able to establish and statistically analyze used market relationships between age, selling (or asking) price and new cost.

Sales Comparison Approach (cont'd)

Subject is a production machine that produces 1,000 units per shift. It has a NRC of $27,500 and has an NUL of 20 yr. It is 10 years old and has had regular maintenance and is in fair condition. The machine has controls that are one generation removed from the new model but still supported by the manufacturer. The new controls increase efficiency by 10%. Similar machines have sold in the last year and your research provides the following data.

	Comp A	Comp B	Comp C
Age	7 yr.	4 yr.	10 yr.
Condition	Good	Excel.	Poor
Units	750	600	500
Sale	$10,000	$12,000	$7,000

Adjustments:
- Age – 10% per year
- Condition – 5% per grade

Sales Comparison Approach (cont'd)

	Subject	Comp A	Comp B	Comp C
Age	10	7	4	10
Cond.	Fair	Good	Excel.	Poor
Units	1,000	750	600	500
Sale	???	$10,000	$12,000	$7,000
Age - 10%/yr.		-30%	-60%	-0%
Cond. - 5%/grade		-5%	-15%	+5%
Units		+25%	+40%	+50%
Adjustments		-10%	-35%	+55%
		$10,000	$12,000	$7,000
		x 0.90	x 0.65	x 1.55
FMV		$ 9,000	$ 7,800	$10,850

VALUE RECONCILIATION

Once the appraiser has reached an initial value conclusion using the various approaches, he or she must analyze those approaches, determining the strengths and weaknesses of each.

Typically, newer assets, special purpose assets, assets with heavy installation, and assets with very little evidence of an active used market are better valued utilizing the cost approach.

Older assets with very little installation and with an active used market, are better analyzed using the sales comparison.

Income-producing assets with substantial market rent and expense data are sometimes better valued by means of the income approach.

Questions for Review

1. What are three examples for which appraisals can be used?
2. Define "reproduction cost."
3. Define "replacement cost."
4. What is Fair Market Value?
5. What are the 3 approaches for defining value?
6. In doing an appraisal the process usually begins with what?
7. How is normal useful life and remaining useful life applied in the appraisal process?
8. What are the sources of data the appraiser will use to confirm the values in the sales approach?
9. What assumption is the cost approach based on?
10. What appraisal approach is seldom used in the appraisal of individual pieces of machinery?

Questions or Comments

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