Chapter 9: Asset Valuation (Equipment)

Knowing how much the machinery and equipment are worth will determine the amount of goodwill that you are paying for as part of the overall purchase price. Valuing these assets is different from valuing other types of assets, such as real estate and intangibles, because the values can differ depending upon the specific circumstances such as liquidation value, going concern value, and installation costs, among others.

Introduction

This is a critical chapter to review since most people gloss over the "real" value of the machinery and equipment. In most cases, the values are lower than normally represented by business owners. A person may be trying to sell the business since she has not upgraded her equipment.

Machinery and equipment are an important part of an asset intensive business, but are usually less important for high technology businesses, where much of the value lies in intangible assets. Nonetheless, there is more contention as to the actual value of such items. A seller may state that the equipment is worth $800,000, but the liquidation value may be only $275,000.

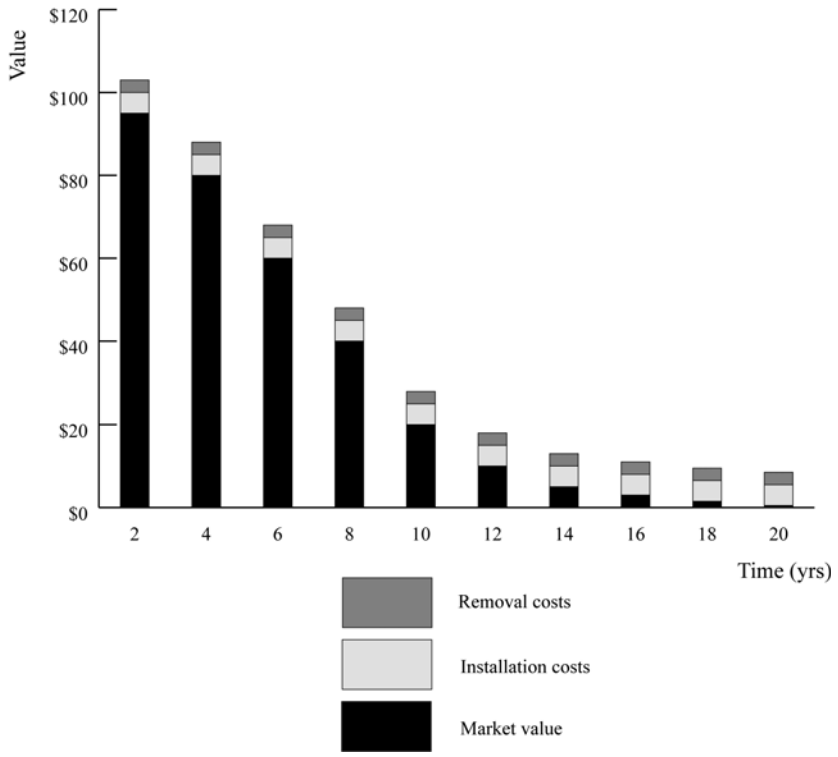
Values can differ depending upon the specific circumstances. Obviously the pieces of an operation will be worth less individually, than if they are part of a "turn key" operation where each piece is an integral part of the overall production line. Similarly, the time until sale is a large factor. The longer that you can wait to sell your equipment, the higher the probability of obtaining a wholesale or even a retail value. The faster you need the money, the higher the discount, and, in turn, the lower the value or cash which you will receive.

Finally, the major difference between machinery and equipment and other tangible assets is the element of installation. For many assets, the installation costs are higher than the machine cost itself. In these situations, the market transactions of used machinery may or may not represent the subject machine's value to the business enterprise. These differences can be more easily shown through Table 9-1.

When valuing machinery and equipment, it is important to specify *exactly* what value is being used. When valuing real estate, personal property or busi-

nesses, the importance and definition of value to each of these disciplines is different. Real estate values rarely have to explain installation costs, since land is stationary. Personal property is typically valued based upon continued use and rarely uses the cost approach like with machinery and equipment. Also, business valuations grapple with the fair market value of the business which is either a control or minority interest.

Figure 9-1: Installation Costs Relative to Age Life of Equipment



In many cases appraisers use "fair market retail values" for a purchase price allocation of machinery where the owner purchased the equipment at liquidation prices. Obviously if you are starting a business from scratch, then you are going to get the least expensive equipment that is still usable. When valuing a business and potentially purchasing the operation, the buyer must identify the downside of selling the equipment, or more importantly, finance the transaction. Bankers will only lend on a forced or orderly liquidation value, since they assume that they will have to unload the equipment at auction prices.

Special or Volatile Equipment

There are all types of industries that have standard equipment that make up most of their assets. Within some companies, many assets have come to be known as "special." This reference is not necessarily applied to an unusual type of product, but to a company made up of assets that, historically, are difficult to sell in a piecemeal removal fashion. Special assets are those that have volatility in recovery, which is caused from various factors such as:

(1) Extremely limited markets
(2) Specialized or unique use
(3) Proprietary equipment
(4) Environment
(5) Fluctuating markets

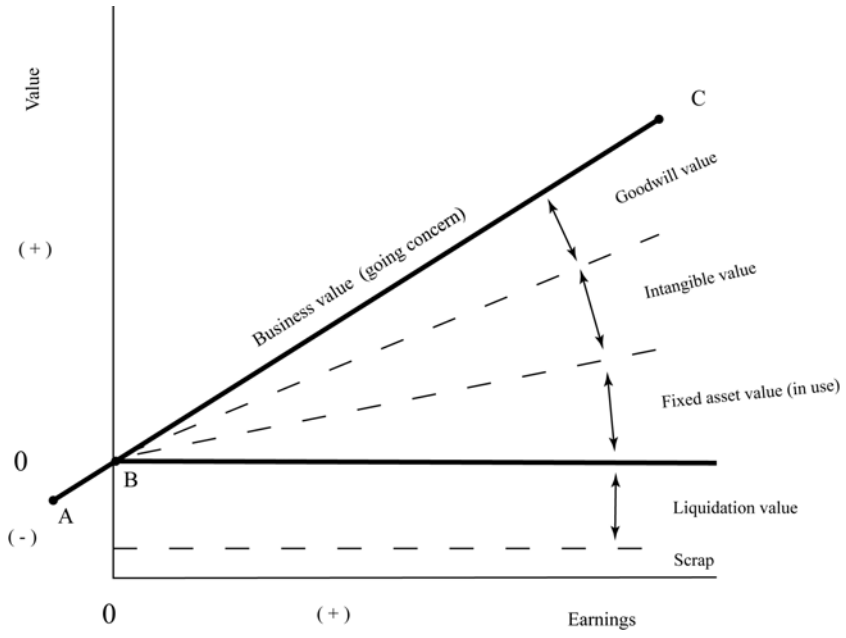
There are some types of equipment that just tend to posses a volatile nature such as computers, telephone systems, paint lines, or proprietary and special use items. These items can cause many debates on value; the value numbers can appear very high or extremely low.

This drastic swing in value makes it difficult to put numbers on "special" types of equipment. Forced sales are not necessarily indicative of what may happen if an orderly liquidation were later to come to pass. Therefore this equipment should be thoroughly researched and all factors should be examined to obtain an accurate appraisal under the guidelines of the American Society of Appraisers' definitions of value.

Value Definitions

As a result of all of the differences mentioned above, many value definitions are available and the right one is needed to be agreed upon before a value can be given. The American Society of Appraisers has definitions which apply to the valuation of machinery and equipment. These value concepts can best be seen visually in Figure 9-2, and are defined in Table 9-2 on page 202.

Figure 9-2: Valuation Definitions Relative to One Another



Purposes of Valuation Relative to Definitions of Value

One must first know the valuation purpose. This purpose usually goes hand in hand with the use of the valuation. For example, if the purpose of the valuation is for the allocation of a purchase price, or for an ongoing business, then the proper valuation concept would be the "Fair Market Value in Continued Use." This definition means the value of the assets to the ongoing business. If the valuation is to be used for financing purposes, then the proper value to be used would be "Orderly Liquidation Value," "Forced Liquidation Value," Liquidation Value in Place," or "Fair Market Removal."

A quick thumbnail sketch of the different values and purposes can be seen in Table 9-2 on page 202.

Approaches to Valuation

Like real property and business valuation, machinery and equipment are value through the cost, market, and income approaches. Value is almost exclusively derived through the cost and market approaches with the income approach being rarely used.

Cost

The cost approach is based upon the assumption that a purchaser would pay no more for an asset than the cost of creating a substitute with the identical utility of the subject asset being valued. This value usually establishes the upper limit of value. Once the replacement cost is established, the condition needs to be accounted for by applying accrued depreciation. As with real property, the depreciation considered is physical curable, physical incurable, functional & economic depreciation.

Sales

The sales comparison approach relies on the assumption that the value of the businesses' assets can be obtained based upon transactions of similar items selling in the secondary or used market. This is easy to see in concept but difficult in reality. Usually the comparable prices of equipment need to be adjusted for differences such as age, condition and capacity of the assets, model, location, date and type of sale (retail sale, auction sale, asking prices, etc.). Also, if valuing the business under a continued use, then the value associated with the cost of assembly or installing the assets needs to be adjusted.

Income

The income approach breaks down the earning capacity of the business assets under investigation. This approach is rarely utilized for individual pieces and is more applicable when analyzing a production line or for a plant which produces a set product.

In summary, the strengths and weaknesses of all three approaches to value can be summarized in Table 9-1.

Table 9-1: Strengths Versus Weaknesses of Approaches to Value

Method	Strengths	Weaknesses
Cost	Good for special purpose assets.	Sometimes economic obsolescence can be overstated.
	Good for new assets.	Depreciation estimate is subjective.
	Good for isolation of different items of depreciation.	Effective age is difficult to estimate; if a machine was rebuilt, then this complicates analysis; time consuming
Market	Most reliable indicator for individual items with established markets.	Certain items have no comparable sales, and adjusting is subjective.
	More accurate measure of depreciation.	Sales data is oftentimes questionable and not detailed, and buyer and seller motivation is unknown.
Income	Recognizes income contribution to a business.	Poor method if specific assets need to be segregated.
	Most accurate measurement of total depreciation of all assets.	Rates of return are subjective and need to be combined with the business value.

Table 9-2 on page 202 shows why it is imperative to use the right definition for the valuation of equipment since each value definition will represent a different percentage of the reproduction or replacement cost new.

Table 9-2: Value Definitions and Users

Term	Short Definition	Users/Purposes	% of Total New Value
Reproduction Cost New	The cost of reproducing a new replica of a property on the basis of current prices with the same or closely similar materials.	Feasibility or alternatives for plant expansion, change, modernization or relocation; used for special purpose machinery; insurance purposes.	95-100%
Replacement Cost New	The current cost of a similar new property having the nearest equivalent utility as the property being appraised.	Feasibility or alternatives for plant expansion, change, modernization or relocation; used for special purpose machinery; insurance purposes; Review any insurance policy for exact definition.	95-100%
Depreciated Reproduction Cost	Reproduction cost new, less accrued depreciation.	Insurance purposes; Review insurance policy for exact definition.	Varies
Insurance Replacement Cost	The replacement cost new as defined in the insurance policy, less the cost new of the items specifically excluded in the policy, if any.	Insurance purposes; review insurance policy for exact definition.	Varies
Insurable Value Depreciated	The insurance replacement cost less accrued depreciation for insurance purposes.	Insurance purposes; review insurance policy for exact definition.	Varies
Fair Market Value	The amount expressed in terms of money, that may reasonably be expected for property in 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. (In valuation of personal property, this definition may need to be further defined based on the function and purpose of the appraisal). This and all fair market values assume that the assets are installed, operating, and are an integral part of the overall business.	Buyers of a business who want a break out for an allocation of purchase price; dissolutions of marriage, partnerships, or corporations to establish an equitable distribution; tax assessors; gift and state taxation.	Varies
Fair Market Value in Continued Use	The amount expressed... all relevant facts; includes installation and assuming that the earnings support the value reported.	Same as above	Varies
Fair Market Value-Removal	The amount expressed....all relevant facts; considers removal of the property to another location.	Same as above	Varies
Liquidation Value in Place	The estimated gross amount expressed in terms of money which is projected to be obtainable from a failed facility assuming the entire facility would be sold intact within a limited time to complete the sale.	Secured lenders, commercial bankers, intermediate term lenders, bankruptcy, entrepreneurs.	Varies

Table 9-2: Value Definitions and Users

Term	Short Definition	Users/Purposes	% of Total New Value
Orderly Liquidation Value	The estimated gross amount expressed in terms of money which could be typically realized from a sale, given a reasonable period of time to find a purchaser(s), the seller being compelled to sell on an "as is" and "where is" basis.	Same as above	Varies
Forced Liquidation Value	The estimated gross amount expressed in terms of money which could be typically realized from a properly advertised and conducted public sale with the seller being compelled to sell with a sense of immediacy on an "as is" and "where equipment is currently located" basis.	Same as above	Varies
Salvage Value	The amount expressed in terms of money that may be expected for the whole property or a component of the whole property that is retired for use elsewhere.	Same as above; also for purposes of selling old inventory.	2-5%
Scrap Value	The amount expressed in terms of money that could be realized for the property if it were sold for its material content, not for productive use.	Same as above	1-2%

Source: American Society of Appraisers and Alico, John. *Appraising Machinery and Equipment*, pp. 63; also American Society of Appraisers. *Introduction to Machinery and Equipment Valuation -Principles of Valuation Student Manual*, ME 201, pp. 8-9.

Identification/Classification of Property

One of the first steps is to establish what is leased and what is owned by the company. This can affect both the machinery and equipment valuation, as well as resulting in mistakes in a business valuation or acquisition.

The classifications, as itemized by the American Society of Appraisers can be seen in Table 9-3.

Table 9-3: Identification/Classification of Equipment

Classification	Identification
Construction in Progress:	(CIP) Includes projects under construction that have not been completed and capitalized. The client recorded costs at the effective date of appraisal should be included in this classification.
Data Processing Equipment:	Computers, printers, plotters, terminals, modems, monitors, work processors, software, and so on.
General Plant Equipment:	Lower unit cost items necessary for the operation of the plant, consisting of factory furniture and fixtures, benches, racks, lockers, scales, hand trucks, time recorders, ladders, fire extinguishers, and so on.
Laboratory and Test Equipment:	All items necessary for the operation of a laboratory or test facility. Typically microscopes, clean tables, fume hoods, ventilating systems, spectrographs, ovens, stills, glassware and other apparatuses.
Machinery:	The most significant personal property values in a business. Items include individual machine units, manufacturing process units or systems. Items include wiring, piping and foundations.
Office Furniture and Fixtures:	Desks, tables, chairs, credenzas, filing systems, cabinets, safes, portable partitions, and so on.
Office Machines and Devices:	Typewriters, calculators, photocopies, check writers, dictation equipment, cash registers, duplicators, and so on.
Patterns and Templates:	Production patterns and/or templates all included.
Plant Piping:	The term “plant piping” should be used for non-process types of industrial installations. Included in both of the above piping classifications will be pipe fittings, valves, hangars, instrumentation, meters, etc.
Plant Vehicles:	Lift trucks, cranes, tractors, etc., which are not licensed for road use.
Power Feed Wiring:	All wiring, conduit, switch gear, distribution panels, circuit breakers, safety switches, bus duct, bus bar, junction boxes, transformers used to distribute energy to electronically operated equipment (excluding those owned by the power company). Substation equipment should also be included when owned by the client. May also include concrete foundations and platforms necessary to support the equipment and fencing which acts as a safety enclosure.
Process Piping:	(Plant Piping), the term “process piping” should be used where manufacturing process systems are used (e.g., oil refineries, food processing, paper mills, and so on).
Motor Vehicles:	Automobiles, trucks, tractors, trailers licensed for road use.
Special Accounts:	A provision to cover assets related to specific industries such as aircraft, bottles and cases (beverage industry), screens (printing), cores and molds (foundry), trays and pans (bakery), etc.
Special Tooling:	Includes all apparatus built for specific operations or applications and includes dies, jigs and fixtures, molds and numerically controlled tapes.
Tools:	Classification should be separated between permanent and perishable. Permanent tools are usually longer life items. These items usually include portable electric and air tools, anvils, vises, gauges, chucks, etc. Perishable tools are usually items which are used up rather than worn out, and include chisels, reamers, drills, collets, taps, and so on.

Source: American Society of Appraisers. *Introduction to Machinery and Equipment Valuation-Principles of Valuation Student Manual*, ME201, pp. 62-63

Data Sources

It is important to classify and identify the equipment for uniformity and consistency. Market data is typically obtained from dealers who are knowledgeable of the equipment being valued. It is suggested that you call a number of dealers and, if possible, go to an auction and ask a lot of questions. Other sources are: used equipment dealers, new equipment dealers, trade and sales journals, newspaper advertisements, private sales, and auction sales. These resources can be seen in Table 9-19 on page 223. In many cases a distributor would indicate what he would pay for the item or items via a fax.

When conducting the research the age, the condition, supply (how many were built), the number in the market (economic life), and the impact of new technology on the equipment should be identified.

Cost Approach

As mentioned earlier, the cost approach usually sets the upper limit for value. Once the price has been obtained, installation costs and depreciation costs need to be reviewed.

Installation Expenses

Installation costs are typically broken down into direct and indirect costs. The most typical costs can be seen in Table 9-4.

Table 9-4: Installation Costs

Direct Costs	Indirect Costs
Freight	Temporary insurance
Rigging and moving	Engineering fees
Electrical	Licenses, permits, fees
Foundations	Overtime
Piping	Security
Millwrighting	Finance charges during construction
Labor for erection	
Taxes	

For most new equipment, the cost of installation is usually a smaller fraction of the overall cost, while liquidation value may have installation or moving costs equal or exceeding value. In the same respect some used equipment is heavily installed and very difficult to remove. The removal may even exceed the value of the piece of equipment being valued.

SIC (Standard Industrial Classification) codes help in determining the installation percents of cost throughout specific industries. The percentages would be variable + or - due to differences in individual equipment within a cat-

egory. The category percentage is typically considered as applied to total equipment cost rather than to each item. An example of SIC codes can be seen in Table 9-5 and Table 9-6.

Table 9-5: Installation Costs (Percentage of Value) for Chemical & Petroleum Products

Industrial Category	Standard Industrial Classification	(Light) Below Std. Weight	(Average) Standard Weight	(Heavy) Above Standard Weight
Chemicals & Allied Product	2800	8%	10%	15%
Manufacturing of Bromide	2819	10%	15%	25%
Plastics, Synthetic Resins	2821	8%	10%	15%
Paints, Varnishes, Enamels	2851	5%	6%	8%
Nitrogenous Fertilizers	2873	15%	20%	28%
Animal Research	2899	0	0	0
Petroleum Refining & Related	2900	10%	15%	25%
Processing	2911	10%	15%	25%
Rubber & Miscellaneous Plastic Products	3000	6%	8%	10%
Miscellaneous Plastic Products	3079	6%	8%	10%

Table 9-6: Installation Costs (Percentage of Value) for Electrical Products & Electronics

Industrial Category	Standard Industrial Classification	(Light) Below Std. Weight	(Average) Standard Weight	(Heavy) Above Standard Weight
Electrical & Electronic Equipment & Supplies	3600	5%	6%	8%
Motor Vehicle Parts	3612	5%	6%	8%
Electromechanical Equipment & Motors	3622	5%	6%	6%
Household Cooking Equipment	3631	5%	6%	6%
Electrical Supply Parts	3634	5%	6%	8%
Radio & TV Transmitting - Manufacture	3662	5%	6%	10%
Electronic Components	3679	5%	6%	12%
Radiographic X-Ray	3693	5%	6%	10%
Electrical Machinery & Equipment	3699	5%	6%	8%
Communication - Telephone, Radio, TV	4800	5%	6%	10%
Television Broadcasting	4833	10%	15%	20%

Table 9-5 and Table 9-6 only show a fraction of the universe of equipment from two industries and their installation costs, as a percentage of the total value. However, they demonstrate one of the methods used to calculate installation costs.

Indexes (Trending)

Sometimes a machine's historic cost (when it was originally purchased) needs to be updated to a current cost for today by applying an inflation factor or index, especially if there is no present day price for the machinery. An index is often used as a cost trend from the date of the last available cost for the machine. It must be noted that trending should only be used as a last resort. Trends are mostly used when calculating replacement and reproduction costs (new)-see definitions in Table 9-2 on page 202.

Examples of broad sources to use for index data are: the Bureau of Labor Statistics of the U.S. Department of Labor (*Producer Price Indexes); R.S. Means Company*; and, *Marshall & Swift Valuation Service*. More specific indices can be found from trade journals. For example, one can use the *American Machinist*, *Chemical Engineering*, *Engineering News Record*, *Iron Age*, and the *Oil & Gas Journal*, to name a few.

Trending Example

If a photocopier was purchased 5 years ago for $21,200, and the trend factor was 1.21 (appreciation of 21% over 5 years), taxes were 6% at the time of sale, and freight and installation costs were $400, then the reproduction cost (new) would be: [$21,200(1.21)(1.06)]+ $400 = $27,591.

The limitation of indices is that they represent average changes in value. Therefore, the broader the index (encompassing more than one industry), the more that average values are used. Inflation also needs to be accounted for. As a result, beyond 5 years, trends or indices have less usefulness for reliability.

Depreciation

Depreciation has been discussed to some degree in Chapter 8. These conditions are based upon economic definitions and not accounting definitions.

Physical Depreciation

Physical depreciation is broken down into curable (calculated cost to cure) and incurable.

Physical Incurable Depreciation

Physical depreciation is caused from age, wear and tear, fatigue, exposure to the elements or lack of maintenance. Overall, physical depreciation is caused more by use rather than age. Incurable physical depreciation is always incurable or non-fixable.

When making use of the cost approach, it is necessary to quantify remaining life in relation to the quality of the asset.

The quality of the equipment being valued ranges from new to scrap. Each item inspected needs to have a quality rating ascribed. The ratings suggested by the American Society of Appraisers can be seen in Table 9-7.

Table 9-7: Condition Versus Remaining Life

Symbol	Condition	Definition	Remaining Useful Life (%)
N	New	Not used before, no loss in value due to physical deterioration.	100
			95
E	Excellent	Nearly-new condition, little use, recently purchased.	90
			85
VG	Very Good	Exceptional good mechanical condition. May have been overhauled or may not have been used enough to require overhaul.	80
			75
			70
			65
G	Good	In good operating condition. May require replacement or repair due to working parts. No known mechanical defects.	60
			55
			50
			45
			40
F	Fair	May require overhaul soon. Has seen lots of service or suffered hard use.	35
			30
			25
			20
P	Poor	Is worn and needs repair. Has seen hard service.	15
			10
S	Salvage	Value in unit components as reusable or spare parts. Little value.	2.5
			0
X	Scrap	No longer serviceable and no value other than for materials only.	1
			0

Source: American Society of Appraisers and Alico, John. *Appraising Machinery and Equipment*, pp. 63

The Age-Life Method is the most typical way of calculating the incurable physical depreciation. To calculate depreciation the following statistics are required: the economic useful life, the effective age, the estimated remaining life, the normal useful life, and the chronological age.

Generally, these items can be used in order to estimate the percentage of depreciation. While the age life formula seen below gives a simple percentage (%) of the asset being depreciated, this formula needs to be adjusted to account for the effective age.

$$\text{Percentage Depreciated} = \frac{\text{Age}}{\text{Life}} \qquad \textbf{(EQ 9-1)}$$

or

$$\text{Percentage depreciation} = \frac{\text{Effective age}}{\text{Total life}} = \frac{\text{Effective age}}{(\text{Effective age} + \text{Remaining life})} \quad \textbf{(EQ 9-2)}$$

$$\text{Normal useful life} = \text{Effective age} + \text{Remaining useful life} \quad \textbf{(EQ 9-3)}$$

For use of the Age-Life formulas, the following terms need to be defined, which are summarized in Table 9-8.

Table 9-8: Definitions of Variables Used in Age-Life Analysis

Term	Definition
Economic Useful Life	Estimated time over which the asset may be profitably used for its intended use. Time may be limited by changing factors of obsolescence and physical age.
Effective Age	Estimated age of the asset in comparison with a new asset of like kind. Often calculated by deducting remaining useful life of an asset from normal useful life. If upkeep and maintenance have been high, then the effective age may be much less than the actual age.
Remaining Useful Life	Time left until the asset stops being useful.
Normal Useful Life	Number of years that an asset will be used until it deteriorates to an unusable condition.
Chronological Age	Number of years elapsed since an item of property was originally built.

Estimating the effective age of machinery and equipment is largely a matter of experience. If upkeep and maintenance are high, then the effective age will be lower than the actual age, and conversely if upkeep and maintenance have been low or non-existent, then the effective age will be greater than the actual age.

Example (1) of Age Life Analysis

A Washex 600 pound washer has a replacement cost (new) today of $87,000 (installed). Normal useful life is 20 years. This particular machine has an effective age of 10 years. Maintenance has been normal. What is the chronological age of the washer, the physical depreciation in dollars, and the depreciated value? The calculations can be seen in Table 9-9.

The Age/Life method can also be used as one way to measure the overall depreciation of a machine. One drawback of an exclusive use of this method is that the Age/Life method reflects only how the asset has been used but cannot measure the effectiveness of how it will be used. Finally, the Age/Life method does not take into consideration functional or economic obsolescence.

Sometimes a breakout of each type of depreciation is needed instead of an Age/Life analysis. The following describes the physical, functional and economic obsolescence that can be calculated.

Curable Physical Depreciation

Curable depreciation is as it sounds-fixable. When making an inspection it is important to note what has been rebuilt within a machine.

Example (2) of Age/Life Analysis

An identical Washex 600 lbs washer which is sitting next to the one described in "Example (1) of Age Life Analysis" on page 209, except this second one has an actual age of 25 years. However, this second machine was rebuilt 3 years ago. The rebuilding brought the Washex washer back to 80% of its new condition. What is the chronological age of the washer, the physical depreciation in dollars, and the depreciated value? These calculations can be seen in Table 9-9.

Table 9-9: Differences in Age Life Between Similar Equipment

	Item	Example 1	Example 2
a	Replacement Cost (new)	$87,000	$87,000
b	Actual Age	15	25
c	Life Expectancy	20 yrs	20 yrs
d	Years since refurbishment	None	3 yrs
e	Contributor Value of Refurbishment	None	0.80
f	Effective Age (c) - [(c)x(e)-(d)]	15	7
g	% Physical Depreciation (f)/(c)	75%	35%
h	$ Physical Depreciation (a)x(g)	$(65,250)	$(30,450)
i	Depreciated Value (a)-(h)	$21,750	$56,550

In order to clarify the above difference between actual and effective age, if the chronological life of an asset is 20 years, the actual age is 5 years, but due to wear and tear the effective age is 10 years, then an asset has depreciated by 50%, and not 25%.

Functional Obsolescence

Functional obsolescence is the loss in value within the property as a result of the development of new technology. This definition is slightly different from that used in real estate. This would include such things as changes in software, design, materials, or process resulting in over capacity, inadequacy, excess construction, lack of utility, excess variable operating costs, change in design, or technology changes.

Functional obsolescence is based upon the lack of utility, excess capacity, change in design, efficiency, and technology change. Sometimes this difference can be obtained from the reproduction cost (new) and the replacement cost (new). Functional obsolescence can be determined through assistance from the manufacturer who upgraded the machine; this is usually converted to a percentage that is used as a sales tool for marketing the newer model. Overall, functional obsolescence is calculated from either a cost savings standpoint, or an excess expense of operating the equipment standpoint, or yield.

Economic Obsolescence

Economic obsolescence may be caused by items such as a reduced demand for the product, increased competition, changes in raw material supplies, increasing costs of raw materials, labor, inflation, the availability of the labor supply, market accessibility, governmental regulations or the contributing earning power of the machine to the overall business.

The most effective way to measure the full effect of economic obsolescence is through an analysis of the earning capacity of the entire business in which the assets are employed.

Lack of utility (inutility) can oftentimes be used as a proxy variable to establishing a discount for a machine or plant that is operating at a level that is less than its rated capability. As an example, if one is appraising a fish cannery production line that has a rated capacity of 500 tons per day, but is only operating at 350 tons per day, then there is an obvious imbalance. The imbalance is an additional unproductive capacity reflected in the capital cost estimate but not reflected in the operating obsolescence.

The penalty for a lack of utility (inutility) is calculated on a percentage basis by comparing the existing operating level to the rated capability through the use of Equation 9-4.

$$\text{Inutility percentage} = \left[1 - \left(\frac{\text{Capacity B}}{\text{Capacity A}}\right)^{n}\right] \times 100 \qquad \textbf{(EQ 9-4)}$$

where:

Capacity A = rated capacity

Capacity B = actual production

n = the scale factor

The above relationship is based upon the notion that the cost of the facilities of different capacities varies exponentially rather than linearly because of economies of scale. Therefore, as capacity increases, so too does cost, but at a different rate. Scale factors will vary depending upon the type of equipment and labor/material ratios. These factors range from 0.4 to slightly greater than 1.0.

Appraising Machinery and Equipment gives a succinct explanation of the scale factor.

The equation suggests that there is an exponential relationship between cost and capacity. This relationship originally was known as the six tenths factor which "...implies that its value is 0.6...C.H. Chilton was the first to publish comprehensive information and data on the six tenths factor. He provided data on some 35 complete plants which indicated that the cost curves for process plants were straight lines on log paper. Their slopes ranged from 0.33 to 1.02, but the bulk of them were closer to 0.6..."

The equation is commonly used by cost engineers when three of the four variables are known. Most commonly, it is used when a specific cost and capacity are known for an asset and the cost estimator is trying to estimate the cost of an individual asset ***but for a different size****.*[1]

Example of Economic Obsolescence

Going back to our example of the 500 ton/day maximum capacity for a fish cannery, let us assume that the existing capacity is 350 tons per day as a result of foreign competition. The replacement cost is $500,000, and physical depreciation is 15%, while the scale factor is 0.7. While the production line is technically state of the art, the calculation of the fair value can be summarized in Table 9-10.

Table 9-10: Example of Economic Obsolescence

Item	Calculation
Lack of utility (inutility) percentage	$= [1 - (350/500)^{0.7}]x100$
	= 22.1%
Cost of replacement	$500,000
Less: physical depreciation @ 15%	(75,000)
Cost of replacement less physical depreciation	$425,000
Less: functional obsolescence	0
Less: economic obsolescence @ 22.1%	(93,925)
Fair value	$331,075

Table 9-10 is simply one method of measuring an aspect of economic obsolescence. Other methods are available.

Market Approach

The market approach is based upon the notion of comparability where a buyer relies upon recent sales of identical or similar machinery. This approach to valuing equipment is the most often used technique for obtaining equipment values.

1. Alico, John. *Appraising Machinery and Equipment*. New York, 1989, pp.125-126.

Items of Comparability and Techniques

There are a number of items which need to be accounted for when looking at comparable equipment. These variables are described in Table 9-11.

There are generally three different techniques used when utilizing the market approach:

(1) direct match

(2) comparable match

(3) percentage of cost

First, the direct match is simply establishing value based upon finding an identical asset. Second, the comparable match is based upon using similar sales, but not identical ones. For example, using a lathe manufactured by Company A, but the appraiser only has sales from Company B. Third, is the percent of cost method. This method uses differences in the sale price and original costs of similar equipment manufactured by different companies.

Table 9-11: Items of Comparability

Item	Nuances
Market Conditions	This the most important variable but is the most difficult to quantify. Declining or increasing markets need to be researched. Supply and demand is an issue, as well as whether it is a buyer's or seller's market.
Location	Vast differences based upon transportation and moving costs, or where the sale took place.
Type of Sale	Auction is more for liquidation, whereas a dealer sale (value in continued use) will result in a higher value obtained.
Age	Same age or model.
Condition	Get an idea of comparable conditions.
Features (accessories)	Should be similar to the equipment being appraised.
Manufacturers	Should be same manufacturer as that being appraised.
Motivation	End user motivation (continued use) versus dealer.
Price	All cash to the seller, or are there terms?
Quality	Should be similar to equipment being appraised.
Quantity	Economies of scale are important. Large unit purchases will give different comparables.
Size/type	Should be similar to equipment being appraised.
Time of Sale	Should be close to the date of value.

Each of these three market techniques is important to use, depending upon the circumstances. In many cases there is no data available and one needs to rely on one of the three techniques. The best method is to obtain a direct match. The next best method is the comparable match, with the percent of cost being the

method of last resort. An example of a comparison of the market approach (comparable match) can be seen in Table 9-12.

Table 9-12: Sample of Adjustments for Equipment

Variable/Adjustment Item	Subject	Sale 1	Sale 2	Sale 3	Sale 4
Age (Yrs)	5	7	4	10	10
Conditions of sale	Excellent	Good	Excellent	Poor	Fair
Capacity Per Minute (P/M)	1000 units P/M	800 units P/M	800 units P/M	800 units P/M	800 units P/M
Sale Price		$8,500	$12,000	$6,000	$6,500
Adjustments					
Age		+20%	-10%	+50%	+50%
Condition		+10%	0%	+30%	+20%
Capacity		+10%	+10%	+10%	+10%
Total of adjustments		40%	0%	90%	80%
Concluded Value		$11,900	$12,000	$11,400	$11,700

Income Approach

The income approach is rarely used and is most useful in looking at a return on investment for leasing expense purposes.

Equipment Valuation Example

The use of multiple values is best seen through a valuation example. Since the easiest and quickest way to calculate values is via the market approach, we will only use this method.

Let us assume that Mr. Nortec wants an appraisal of some machinery and equipment for fire insurance purposes, as well as for financing with a bank. In addition, he also wants some values for ad valorem tax purposes since he is not sure if he is being over taxed. He is possibly considering bankruptcy and also wants to know what the value would be under a distressed sale, as well as for potential reorganization purposes.

Therefore, he wants to find the following values: (1) reproduction cost (new); (2) replacement cost (new); (3) depreciated replacement cost; (4) fair market value in continued use; (5) orderly liquidation value; and, (6) forced liquidation value. He has values for most of his equipment, except for his photo copier and his three milling machines.

Copier Valuation

The MRI X8000 copier was purchased new, five years ago for $32,000 plus 6% tax, and freight and installation costs of $625. The trend factor for this type of equipment is 1.05. This model has a normal useful life of 9 years. The last model was made three years ago. The current replacement model is now the X9000, with a 25%-250% zoom, and sells for $31,500, with a 7% sales tax and $480 freight and installation. Straight line depreciation is 55% (effective age of 5 years divided by the life expectancy of 9 years).

The Orion Price book of used equipment (see Table 9-19 on page 223 for information on how to obtain this book) shows that the MRI X8000 sells for $10,000 retail, plus tax and installation. Other publications indicate that copier dealers are buying them for between $6,000-$7,000. Five auctions, which were advertised due to bankruptcy, indicate that the machines sold for between $3,150 to $4,600 each. Table 9-13 shows the differences in values.

Table 9-13: Summary of Values-MRI X8000

Value Definition	Concluded Value	Calculations
Reproduction Cost (New)	$36,241	$32,000 x 1.06 $33,920 x 1.05 $35,616 + $625 $36,241
Replacement Cost (New)	$34,185	$31,500 x 1.07 $33,705 + $480 $34,185
Depreciated Replacement Cost	$14,175	$31,500 x (1-0.55) $14,175
Fair Market Value	$10,916	$10,000 x 1.07 $10,700 +[(1-0.55) x $480] $10,916
Orderly Liquidation Value	$6,500	Best Guess
Forced Liquidation Value	$3,800	Best Guess

Milling Machine Valuation

There are three milling machines which are currently being used. They all have 15 horsepower engines. Mr. Nortec's records indicate that the three milling machines were purchased new and installed 23 years ago at a cost of $18,000, and the cost of installation 23 years ago was $500, or 200 man hours. The serial numbers indicated that all three machines were built 25 years ago. Each machine weighs 36,000 pounds. The normal useful life of each machine is 25 years; however, the machines were rebuilt 5 years ago. The rebuilding of the

machines extended their life to 80% of their normal useful life, or 20 more years. The existing cost of freight is $35/100 lbs, and the labor cost is $35/hour. There is evidence of functional obsolescence between 50 horsepower engines and 80 horsepower engines, with 80 horsepower engines currently being preferred. The cost of a 50 horsepower engine is $12,000 while the price of an 80 horsepower engine is $18,500. The trend factor is currently 10. The subject has the specifications summarized in Table 9-14.

Table 9-14: Subject Lathe Specifications

Item	Measurements/rating
Swing over bed and carriage wings	38”
Swing over cross slides	25”
Bed width	32”
Centers	60”
Spindle Nose:	
Tapered Key Drive, Standard	L3
Camlock, Standard	11”
55 horse power, 2000 RPM motor	Standard
Weight	36,000 lbs
Original Cost, 25 years ago, factory FOB, with motor and electric controls	$20,000

Table 9-15: Market Specifications For Identical Lathe Produced Today

Item	Measurements/rating
Swing over bed and carriage wings	38”
Swing over cross slides	25”
Bed width	32”
Centers	60”
Spindle Nose:	
Tapered Key Drive, Standard	L3
Camlock, Standard	11”
80 horse power, 2000 RPM motor	Standard
Weight	36,000 lbs
Current Price, FOB, from factory with motor and electric controls	$183,000

There have been six recent sales, which are summarized in Table 9-16.

Table 9-16: Transactions of Recent Lathes

Manufacturer	Transaction Date	Age	Size or Model	Horse Power	Sale Price	Sale Location	Sale Condition
Third Party							
Monarch	6 months ago	23 yrs	40” x 60”	-	$69,000	Virginia	Good
Leblond	1 year ago	25 yrs	39” x 72”	-	$58,000	Arkansas	Good
Monarch	1 year ago	23 yrs	34” x 60”	-	$72,500	Nevada	Good
Auction							
Monarch	1 year ago	23 yrs	40” x 66”	-	$21,000	Maine	Good
Churchill	2 years ago	25 yrs	34” x 64”	-	$24,000	Arizona	Good
Leblond	2 years ago	24 yrs	39” x 72”	-	$13,000	Oregon	Fair

The concluded values can be seen in Table 9-17.

Table 9-17: Summary of Values-Lathe Machine

Value Definition	Concluded Value	Calculations
Reproduction Cost (New)	$199,600	($18,000 x 10) + $7,000 + $12,600
Replacement Cost (New)	$196,100	$183,000 – $6,500 + $7,000 + $12,600
Depreciated Replacement Cost	$107,855	$196,100 x (1 - 0.45)
Fair Market Value		
Cost	$100,650	$183,000 x (1 - 0.45)
Market	$78,595	$70,000 + ($12,600 x 0.45) + ($6,500 x 0.45)
Orderly Liquidation Value	$35,000	Best Guess
Forced Liquidation Value	$12,500	Best Guess
Depreciation		[20-(20x0.8)-5]/20=45%
Current Installation Cost		200 man hours x $35/hr = $7,000
Current Freight Costs		36,000/100 x $35 = $12,600
Functional Obsolescence		$18,500-12,000 = $6,500

Observation

A good rule of thumb in determining the orderly liquidation value of equipment is to use the value which a dealer would pay to resell the equipment.

It is critical to visit a few auctions which sell equipment. While cash flows are important to run a business, it is just as important to identify where these cash flows are coming from, and how the equipment affects the business, and whether this equipment needs to be replaced in the near future. Having a basic understanding of equipment and maintenance costs is imperative to any degree of success.

Appraisers, Liquidators & The Auction Game

Table 9-18 gives a breakdown of some potential professionals to use, and each one's advantages and disadvantages.

Table 9-18: Professionals to Use for Equipment Valuations

Type	Pros	Cons
Appraiser	Good overall background for valuations. Good for one stop shopping if there are multiple types of equipment spanning multiple industries. Usually good data sources.	Fee may not pay for the best appraisal. Temptation to cut corners if possible. Knowledge may be limited for larger assignments where an engineering background may be needed.
Dealer	Gives you a good idea as to what is hot and not.	Possible bias is involved.
Auctioneer	Gives you a good idea as to what the trends are. Very informative for bankers.	May not be able to perform. You may get gouged if you use them. Experience may not be comprehensive enough for some industries. Bias is involved.
Liquidator	Gives you rock bottom price as to what you will realistically obtain if you try to sell equipment in a hurry. Provides needed liquidity.	May not receive best price. Bias is involved.

Auctions

Selling the equipment at an auction can be done either at a company's premises or at an auctioneer's facility.

First, auctions held at the business will generally range in cost from $5,000 plus 7-10% of the sale proceeds, to a maximum of 15-25% of the proceeds and not having any up front costs. This percent varies depending on the recovery of items auctioned. Both of these costs do not include advertising, which would be picked up by the lender or seller. Obviously advertising works best for larger equipment sales.

A second alternative is to have the equipment moved to the auctioneer's location. This ranges from $50/hour for hauling, plus a percentage, or 35-50% of the proceeds obtained (freight and advertising inclusive). Obviously this is the more expensive route. However, when a company is auctioning assets in a piecemeal fashion the property is typically for sale and needs to be cleaned for best appeal. It is important to remember that auctions are not always the proper method of disposal and, if the equipment is used, auctions may not produce the miracles anticipated.

There is much to decide before holding an auction. If an auction is absolutely necessary, it is vital to research well respected auctioneers. Cost should be weighed with recovery. The old saying holds true that "You get what you pay for." For instance $20,000 spent on advertising could easily increase the final proceeds by $100,000. Finally, having an auction during the week may bring fewer people than having an auction on the weekend.

Liquidators are speculators and act as a “go-between” for the lender and auctioneer, and charge a percentage of sale, or they simply purchase on their own account and then resell to an end user, thereby bypassing the auctioneer and/or dealer. This approach will yield the lowest return to a lender.

The primary service is one of converting assets to money. This can be done with activities ranging from business brokerage, to the sale of parts of the business, raising funds from surplus assets, consulting on business practices, to the sale of the entity either in piecemeal or in whole.

The following is an overview of pricing options that might aid in choosing a fee for the liquidation of a business.

1. Contract price

This is usually not acceptable as there is no incentive to the liquidator. This sometimes can create the suspicion that the liquidator only did a token job to receive the contracted fee.

Example: Agreement to sell for a fee set at $25,000 regardless of the result.

2. Scaled fee

This is a method of having fees based upon specific levels of recovery. These fees may be scaled up (higher fees for the higher recovery levels) or down (lower fees as recovery reaches higher levels). Both of these scales have advantages that may be associated with the type of assets or circumstances of the company required to be liquidated. Some believe that the rising fees are incentives for the liquidator to strive for higher results, and others believe that the lowering fee scale provides for a weighted fee that is fair (proportionate to the size of the sale) to the seller.

Example: Scaled up 5% to $1,000,000; 6% to $2,000,000, and 7% for all above.

Example: Scaled down 10% to $500,000; 7.5% to $1,000,000, and 5% for all above.

3. Split fee

This is used many times where the liquidator may have some concern on the level of recovery. There is usually an agreed upon level of recovery above which all cash is split on a percentage basis that may be weighted in favor of the seller and in some cases weighted in favor of the liquidator. This may be dependent upon the perceived risk to be taken by the liquidator. In many cases, the split may come after a set amount plus one-hundred percent (100%) of the expense reimbursement (cost of promotion and sale). There are creative alternatives to this such as different splits at different levels including a fee limit or level with no additional fee payments.

Example: $1,000,000 no fee, the next $125,000 pays for expenses, and all above is 40% to the liquidator and 60% to the seller.

4. Guarantees

Some liquidators will offer guarantees for which any lower level recovery will require the liquidator to pay the difference. This procedure can have some detriments, when comparing the dollar cost of the service. The liquidator will expect a greater fee or percentage due to this additional risk. This is no different than interest that is charged by banks based upon risk. In addition, the guarantee level or indicator is usually conservative and yet there is a greater fee (cost to the seller). This is not always the best fee arrangement unless the seller wishes to pay for this comfort level. In most cases, especially in developing countries, there is too much risk or too high a required guarantee level that could economically allow any liquidator to take that type of gamble.

Example: 5% with no guarantee or a guarantee of $2,000,000 for a fee of 7.5% of the gross sale.

5. Purchase to sell

At times the best method is to sell the assets to the liquidator. Some countries do not allow this by law if the liquidator is a citizen of the country (e.g., United Kingdom). The public or private resale of the assets by the liquidator provides a fee based upon the difference between the cost plus expenses and the sale(s) to others (profit). There are usually agreements associated with this sale to the liquidator such as free rent or rights to stay for a period of time, utility contracts, security and even use of insurance. In some negotiations the liquidator may allow more payment back to the seller if the sale brings substantially more than could have been anticipated. This is allowed when the liquidator wishes to continue a relationship with the seller (client) and, therefore, would not want the seller to believe that there was an advantage taken in the acquisition.

Example: Purchase for $1,000,000, cost of sale $200,000, sale expected to bring about $1,600,000 to no more than $1,800,000. The agreement is that anything above $1,900,000 will be split with the seller as an unexpected recovery; a participating percentage can also be set at differing levels.

6. Straight fee

The fee arrangement for the best net to the seller is a simple straight fee commission or flat percentage without guarantees. The seller must depend upon the reputation or confidence of the liquidator.

Example: Sale = $1,500,000, Fee = 5% ($75,000) plus expenses of $32,000. Total cost of sale = $107,000. Net proceeds to seller = $1,393,000.

Summary

Expenses can be estimated and made a part of any of the above fee arrangements. They can be included as a part of the fee or in most cases as separate and apart from the fee. The seller may elect to pay for all or part of the expenses or the liquidator may be required to spend his money for all normal expenses of sale. Normal expenses may be advertising, travel of sale personnel, cleanup, merchandising, control or observing of removal. Abnormal expenses may be repairs, utilities, rent, and/or marshaling expenses.

Example: Estimate at $200,000 for expenses as shown in a proposal with an itemization of how the money will be spent that totals the expense limit. Whether the expenses are part of a fee or not, the seller should still expect to know how the sale will be advertised and prepared.

Data Specification Sheet for Machinery & Equipment

The following checklist is helpful when requesting information about a specific piece of equipment.

PHYSICAL CHARACTERISTICS

Name of Machine
Name of Manufacturer
Model Number
Serial Number or Identification (ID) Number
Size and/or Capacity and Type
Description of Operating Function
Date of Purchase
Age at Time of Purchase
Manuals Available or on File
Materials of Construction if Process Equipment or Specialty Items
Extras or Optional Attachments
Drive and/or Motor rating
Controls
Electrical Connections
Piping and Connections
Millwright Work
Foundations (Above grade or below grade)

ECONOMIC CHARACTERISTICS

Amount Paid for Item
Cost of Transportation/Freight
Cost of Installation
Original Refurbishment Costs
Installation Costs by Contractors
Cost of Other Connections or Mill Work
Annual Maintenance Costs
Other Costs

LEGAL CHARACTERISTICS

Liens on Machinery
Capital or Operating Lease
Copy of Lease Document
Title or Original Invoice Copy
Insurance

Data Resources

There are a number of resources which are helpful to get an overview of the value of certain pieces of equipment. While this list is not exhaustive, it is helpful.

Table 9-19: Machinery & Equipment Resources

Name	Address/Phone #	Description of Equipment to be Found
Bexel Corporation	www.bexel.com	Audio & Video
Medstore and Medical Equipment Mall	www.medstore.com	Medical Equipment & Lab Equipment
Broadcast Solutions	www.broadcastsolutions.com (818) 842-2206	Broadcast Equipment
CS Plastic Services, Inc	www.csplasticserv.com	Refurbished Extruders for the Profile, Sheet, Pipe, Film & Recycling Industries
Custom Video Productions	www.cvpnj.com	Video Production Equipment
ACE Index	www.acecam.com/ cr2index.html	Manufacturers of Photographic Darkroom Equipment and Supplies
Diamond Jack Machinery	www.diamondjackmachinery.com (479) 785-2554	Metalworking Machinery
Edward Ehrbar Inc	www.ehrbar.com (914) 738 5100	Construction Equipment, Sales, Parts, Service & Rentals
Farm & Ranch Equipment, Inc.	www.farm-equipment.net	Farm & Ranch Equipment
Farmers Hotline	www.farmershotline.com	Farm Equipment
Forklifts	www.forkliftforum.com	Forklifts
Global Restaurant Equipment	www.chefsupplies.com (800) 333-2001	Restaurant Supplies & Equipment
Hall-Associates	www.halltug.com	Tugboats, Barges & Marine Brokers
Hancock Printing Equipment	www.hancockprinting equip.com	New and Used Printing Equipment
Hyman Equipment Company	hymanequipment.com	Dealer in Plant, Construction, Farm, Metalworking, Plastics, and General Industrial Equipment
Allied Graphic	alliedgraphic.com	RIPS, Photo Processors & Used Copier Equipment
Ingersoll Rand	www.ingersoll-rand.com	Equipment & Products for Infrastructure Development
Pendex	www.pendex.com	Test & Lab Equipment
HK Equipment	www.hkequip.com	Used Lab Equipment
LabX	www.labx.com	Lab Equipment
ForestIndustry.com, Inc	www.forestindustry.com	Logging Industry & Equipment
Machinery Trader.com	www.machinerytrader.com	Construction Equipment
Machinery Values Inc.	www.machineryvalues.com	Machine Tool Dealers
SJF Material Handling Equipment	www.sjf.com	(Conveyors) Balers, Carts Conveyors, Dock Equipment, Hoppers, Ladders, Lift Equipment, Packaging, Pallet Jacks, Racks, Scales, Wire Partitions, Work Benches
Mazak	www.mazak.com	Machine Tools

Table 9-19: Machinery & Equipment Resources

Name	Address/Phone #	Description of Equipment to be Found
PeMed	www.pemed.com	Used Medical Equipment
Media Concepts	www.mediaconceptsinc.com	Re-sale of Used Production and Broadcast Equipment
Mettler Toledo	www.na.mt.com	Scales and Measurement Devices
Modern Tool Ltd.	www.moderntool.com	Dealers of New and Used Machine Tool and Metal Working Machinery.
Morton Machinery	www.mortonmachinery.com	Metalworking, Gear Equipment
NS Machine Corp	www.nsmachine.com	Metalworking, Packaging, Processing
Odyssey Pro Sound	www.odysseyprosound.com	Audio & Recording Equipment
P&H Equipment	www.phequipment.com	Forklifts
BEF Corp.	www.bef.com	Photo and Refurbished Minilabs
Plasticx Universe	www.plasticx.com	Plastics Industry
RDK Truck Sales	www.rdk.com	Garbage Trucks & Rolloffs
RK Equipment Co.	www.rkequipment.com	Used Photo Processing Equipment
BMI	www.bmius.com	Scientific Test and Measurement Equipment
Scott Machinery & Supply, Inc.	www.scottmach.com	Metalworking Equipment
Equipment Resources Inc.	www.eri-ca.com	Semiconductor Equipment
Sound Productions Inc.	www.soundpro.com	Audio Equipment
BCS	www.broadcaststore.com	Broadcast Equipment
Trader Online	www.traderonline.com	Cars, Trucks, Airplanes, Heavy Equipment, RV, Boats
US Airmotive Forklifts, Inc.	www.usairmotive.com	Forklifts, Aviation
United Broadcast Group	www.usedvideo.org/	Broadcast Equipment
Todo Foto	www.todofoto.com	Minilabs, Parts & Accessories
Used Test Equipment & Used Semiconductor Equipment	www.big-list.com	Dealer Sites
Rent Com, Inc	www.rentcom.com	Rental Presentation Equipment
RS & Associates	www.videoused.com	Video Equipment
Hildebrand Machinery Co.	www.hildebrandmachinery.com	Metalworking Machinery
Polysort	www.polysort.com	Plastics and Rubber Industry
US Broadcast	www.usbroadcast.com	Broadcast Equipment
ExFactory	www.exfactory.com	Woodworking Equipment
Plastics One Inc.	www.plasticsone.com	Plastic Injection and Molding Machinery Equipment
(ASA) American Society of Appraisers	www.appraisers-norcal.com (800) ASA-VALU	Appraisal Society
Orion Blue Books	www.obluebook.com (800) 844-0759	Blue Books for Computer, Audio, Car Stereo, Copiers

Table 9-19: Machinery & Equipment Resources

Name	Address/Phone #	Description of Equipment to be Found
The Book	www.thebooklm.com (800) 262-8005	Pricing & serial # Reference Guides for Industrial Machinery and Equipment (Metal Working, Wood Working, Plastic, Lift Trucks, Printing & Graphic Arts, Food & Chemical Processing, Medical & Hospital Equipment, Post Audio & Video, Computer Manufacturing Equipment).
The Last Bid (McGraw Hill Construction)	www.ironmax.com www.construction.com (800) 858-0555	Auction Value Guides for Construction Equipment, Trucks and Trailers
Machinery Trader	www.machinerytrader.com (800) 247-4898	Machinery Trader is the Marketplace for Buying and Selling Heavy Construction Equipment.
Top Bid	www.topbid.com (800) 633-5953	TOP BID is an Accurate Authority on Construction Equipment Values, the Equivalent of the Auto Industry's Blue Book.
MDNA Buyers Guide	www.locatoronline.com (800) 537-1446	Online Source to find Used Metalworking Machinery
Marshall & Swift	www.marshallswift.com (800) 544-COST	Residential and Commercial Building Cost Data
Thomas Register	www.thomasregister.com (800) 699-9822	Universal Directory of Manufacturers of Industrial Products and Services.
Hot Line Farm Equipment Guide	www.farmershotline.com (800) 247-2000	Directory for Agricultural Equipment Values.
Trade a Plane	www.trade-a-plane.com (800) 337-5263	World's Largest Database of Aircraft and Aviation Products and Services.
Asay Publishing Network	www.asaypub.com (800) 395-0222	Office Machinery and Business Equipment Used Prices Guide (Copier Bluebook)
B&H Photo-Video-ProAudio	www.bhphotovideo.com (800) 606-6969	Professional Video Sourcebook
Aircraft Bluebook	(800) 654-6776	Fixed Wing and Helicopter Bluebook.
Mobile/Manufactured Home Bluebook	(312) 726-2802	Used Mobile Homes
Primedia Business Magazines & Media	(800) 621-9907 www.pricedigests.com	Used Truck Valuations
Kelly Blue book	www.kbb.com (800) 258-3266	Used Car Valuations