STATE OF CALIFORNIA

STATE BOARD OF EQUALIZATION
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TO COUNTY ASSESSORS AND INTERESTED PARTIES:

COMPUTER VALUATION METHODOLOGY

Valuation of computer equipment has become an increasingly important part of many business property assessments. One of the problems encountered by the Board, assessors, and taxpayers is that there has been no universally agreed upon methodology to be used for developing valuation factors for computers. In order to minimize uncertainties and ensure that the process of developing annual computer valuation factors is fair, understandable, and thorough, the Board intends to adopt a methodology for developing the factors as soon as possible and in any case prior to the 1996 assessment season.

As part of the process of developing the methodology, Board staff will hold a public meeting with all interested parties on August 17, 1995 to discuss computer valuation methodologies. The meeting will begin at 1:30 p.m. and will be held in Room 121, 450 "N" St., Sacramento, California. This is a public meeting open to all interested parties. Our hope is that assessors, Board staff, and other interested parties can find agreement on a methodology to be presented to the Board. If agreement cannot be reached, we will isolate the areas of disagreement and prepare an appropriate report to the Board.

If you are unable to attend the meeting or have questions or comments, please contact Mark Buckley or Randy Bertholf at (916) 445-4982, or mail your comments to Assessment Standards Division, P.O. Box 942879, Sacramento, CA 94279-0064. Our FAX is (916) 323-8765. Your ideas will be especially helpful if we receive them prior to the August 17 meeting.

Following are issues relevant to developing cost approach factors for valuation of computers. We hope this listing of issues can be used as a framework for discussion at the August 17 meeting.

Section I below discusses the two basic methods most commonly used for cost approach valuations. Section II discusses issues relevant to computers.

I. GENERAL APPROACHES TO DEVELOPING FACTORS USED IN THE COST APPROACH

A. Develop a Separate Replacement Cost Index and a Separate Percent Good Factor

Advantages

* This method is the most accurate if the trend in replacement cost varies from year to year.

* There are government and private agencies which track trends in replacement cost.

* Percent good factors can be developed using either a lifing method or market method.

* This is a methodology that is familiar to the assessment community.

Disadvantages

* This method requires an extra step in collection of data.

* When replacement cost index factors come from a data set that is different from the data set used to compute the percent good factors, the chance of double counting or undercounting depreciation increases.

* For some types of equipment, trend factors are unavailable or difficult to derive.

B. Developing a Combined Factor that Represents Both Replacement Cost and Percent Good

Advantages

* This method is easier to measure.

* It can be developed using either an annual rate of decline or a static measurement between time periods.

* Since both the replacement cost adjustment and depreciation percent good factors are derived as a combined number from the data, there is no chance of under/overcounting obsolescence.

* This a methodology that is familiar to the assessment community.

Disadvantages

* Difficult to update - this method assumes that the rate of depreciation does not change between lien dates, so it requires a new study every time the pattern of depreciation varies.

* It requires a separate measurement of decline between each time period.

II. SPECIFIC METHODS OF CALCULATING FACTORS FOR USE IN THE COST APPROACH

A. Methodology for Developing Replacement Cost Index Factors

1. Use a published price index such as one developed by the Bureau of Labor and Statistics

Advantages

* This method requires minimal data collection.

* It is easy to verify independently.

* It is easy to update.

Disadvantages

* This method assumes the index source has accurately computed the index.

* The index may not correctly match the property being appraised.

2. Measure change in selling price new from average of prior year to average of current year

Example with 1990 as a base equaling 1.00:

Average price new in 1990 =$1,000	
Average price new in 1991 =$1,100	price index = 1.10 ($^{1100}/_{1000}$)
Average price new in 1992 =$1,200	price index = 1.20 ($^{1200}/_{1000}$)
Average price new in 1993 =$1,300	price index = 1.30 ($^{1300}/_{1000}$)
Average price new in 1994 =$1,400	price index = 1.40 ($^{1400}/_{1000}$)
Average price new in 1995 = $1,500	price index = 1.50 ($^{1500}/_{1000}$)

The resulting trending table is:

1995	=	1.00	($^{150}/_{150}$)
1994	=	1.07	($^{150}/_{140}$)
1993	=	1.15	($^{150}/_{130}$)
1992	-	1.25	($^{150}/_{120}$)
1991	=	1.36	($^{150}/_{110}$)
1990	=	1.50	($^{150}/_{100}$)

Advantages

* This method allows computation of an index when none is available through independent sources.

* Composition of the data set is known and the results are verifiable.

Disadvantages

* This method requires extensive data research.

* It requires estimations of average selling price during various time periods.

* It requires estimations of market share for different brands of equipment.

* It assumes the data set is an accurate representation of the entire population.

3. Measure the change in selling price new from a specific point in time to the same time point one year later

Example with 1990 as a base equaling 1.00:

Selling price new price January 1, 1990 = 975

Selling price new price January 1, 1991 = 1075-- Price index January 1, 1991 = 1.10 ($^{1075}/_{975}$)
Selling price new price January 1, 1992 = 1150-- Price index January 1, 1991 = 1.18 ($^{1150}/_{975}$)
Selling price new price January 1, 1993 = 1275-- Price index January 1, 1991 = 1.31 ($^{1275}/_{975}$)
Selling price new price January 1, 1994 = 1400-- Price index January 1, 1991 = 1.44 ($^{1400}/_{975}$)
Selling price new price January 1, 1995 = 1475--Price index January 1, 1991 = 1.51 ($^{1475}/_{975}$)

The resulting trending table is:

95	=	1.00	($^{151}/_{151}$)
94	=	1.05	($^{151}/_{144}$)
93	=	1.15	($^{151}/_{131}$)
92	=	1.28	($^{151}/_{118}$)
91	=	1.37	($^{151}/_{110}$)
90	=	1.51	($^{151}/_{100}$)

Advantages

* This method allows computation of an index when none is available through independent sources.

* Composition of the data set is known and the results are verifiable.

Disadvantages

* This method assumes the data set is an accurate representation of entire population.

* It requires extensive data research.

B. Methodology for Developing Percent Good Factors

1. Analyze retirement data to calculate the pattern of retirements and the estimated remaining life at annual intervals in the property's life

Advantages

* This method is a well-accepted method of determining percent good factors.

* If the data set is known, the results are independently verifiable.

Disadvantages

* This method is used to calculate percent good of equipment subject to normal physical deterioration and obsolescence--it is not designed to measure percent good of equipment subject to rapid or fluctuating obsolescence.

* It requires extensive data collection.

* Records of companies in the industry are not normally kept *in* such a fashion as to record the necessary information correctly; many assumptions must be made to analyze the data.

2. Compare sales of equipment new to sales of equipment used to determine the amount of change attributable to physical depreciation

Example:

Selling price of a new item January 1, 1991 = 1075

Selling price used of identical item 1 year old on January 1, 1991 =950
Selling price used of identical item 2 years old on January 1, 1991 =900
Selling price used of identical item 3 years old on January 1, 1991 = 800
Selling price used of identical item 4 years old on January 1, 1991 =700
Selling price used of identical item *5* years old on January 1, 1991 =600

Percent good at 1 year old = 88% $(^{950}/_{1075})$
Percent good at 2 years old = 84% $(^{900}/_{1075})$
Percent good at 3 years old = 74% $(^{800}/_{1075})$
Percent good at 4 years old = 65% $(^{700}/_{1075})$
Percent good at 5 years old = 56% $(^{600}/_{1075})$

Advantages

* The results are verifiable.

* The factors are easy to compute.

Disadvantages

* Depreciation is calculated at only one point in time.

* The age of the equipment must be identifiable at any point in time.

* Due to rapid technological changes, it is difficult to find old equipment that is functionally identical to new equipment.

C. Methods for Developing Combined Factors

1. Compute annual decline in price

Example:

Selling price new in January 1 1990 = 1000

1 year old selling price used January 1, 1990 = $900 change in price = 10% decline
2 year old selling price used January 1, 1990 = $790 change in price= 12% decline
3 year old selling price used January 1, 1990 = $720 change in price = 9% decline
4 year old selling price used January 1, 1990 = $670 change in price = 7% decline
5 year old selling price used January 1, 1990 = $580 change in price= 13% decline

Average annual rate of decline annual rate of decline = 10%
(10%+12%+9%+7%+13% = 51% / 5 = 10%)

Combined factor for equipment:

1995 = 100% (100% times 1.0)
1994 = 90% (100% times 0.9)
1993 = 81% (90% times 0.9)
1992 = 73%, (81% times 0.9)
1991 = 66% (73% times 0.9)
1990 = 59% (66% times 0.9)

Advantages

* This method is easy to compute.

* It is easy to understand.

Disadvantages

* This method assumes annual depreciation is consistent.

* It assumes price changes do not vary between time periods.

* It can produce results which are correct over a long time span but incorrect for individual time periods.

* Due to rapid technological changes, it is difficult to find old equipment that is functionally identical to new equipment.

2. Compute historical changes in price

Example:

Selling price new in January 1 1990 = 1000

1 year old selling price used January 1, 1990 = $900 1 year old factor = 90% ($^{900}/_{1000}$)
2 year old selling price used January 1, 1990 = $790 2 year old factor = 79% ($^{790}/_{1000}$)
3 year old selling price used January 1, 1990 = $720 3 year old factor = 72% ($^{720}/_{1000}$)
4 year old selling price used January 1, 1990 = $670 4 year old factor = 67% ($^{670}/_{1000}$)
5 year old selling price used January 1, 1990 = $580 5 year old factor= 58% ($^{580}/_{1000}$)

Advantages

* It is relatively easy to determine prices at specific points in time.

* Depreciation factors are easily verifiable from the data.

Disadvantages

* By the time depreciation is measured for several years, the earliest data points are several years old and possibly incorrect.

* Data for 1 year old equipment can be difficult to locate.

* Due to rapid technological changes, it is difficult to find old equipment that is functionally identical to new equipment.

3. Compute changes between current lien date and previous years

Example:

Selling price used in March 1 1995 = $1,000

Average selling price new in 1994 = $1,200
Average selling price new in 1993 = $1,500
Average selling price new in 1992 = $1,900
Average selling price new in 1991 = $2,300
Average selling price new in 1990 = $3,000

1 year old combined depreciation factor= 83% ($^{1000}/_{1200}$)
2 year old combined depreciation factor= 67% ($^{1000}/_{1500}$)
3 year old combined depreciation factor= 53% ($^{1000}/_{1900}$)
4 year old combined depreciation factor= 43% ($^{1000}/_{2300}$)
5 year old combined depreciation factor= 33% ($^{1000}/_{3000}$)

Advantages

* This is the most theoretically accurate method for developing combined factors.

* This is the same method used to develop percent good factors for real estate.

Disadvantages

* This method requires annual updating.

* It requires a determination of average selling price in previous years.

Certainly the foregoing discussions do not include all the possible opportunities and problems involved in developing cost approach tables for computers. However, we hope this paper can provide a starting point for Board staff, industry, and assessors to find a mutually acceptable method for developing such tables.

Sincerely,

John W. Hagerty
Deputy Director
Property Taxes Department