Issues Related to the Unit Valuation Principle

Robert P. Schweihs and Robert F. Reilly, CPA

Generally, a taxpayer's total operating assets can be valued individually using the summation valuation principle, or the taxpayer assets can be valued collectively using the unit valuation principle. Many taxing authorities use the unit valuation principle to value industrial or commercial taxpayer assets. The tax authorities use the unit valuation principle when the taxpayer assets cross tax jurisdiction borders or when the assets are functionally and economically integrated. In such instances, the use of the unit valuation principle is believed to be more efficient than the use of the summation valuation principle. This discussion summarizes the generally accepted unit valuation approaches, methods, and procedures. And, this discussion describes and illustrates some of the application limitations associated with the use of the unit valuation principle.

INTRODUCTION

This discussion focuses on the unit valuation of industrial and commercial taxpayer properties for property tax purposes. In particular, this discussion focuses on the application of generally accepted unit valuation approaches, methods, and procedures.

The objective of the unit valuation is to value the taxpayer's assets. The objective of the unit valuation is not to value the taxpayer's debt securities and equity securities. Even in a unit valuation, the property tax should be based on the value of the taxpayer's ownership of assets, and not on the value of the debt holders' and equity holders' ownership of the taxpayer securities.

In most unit valuations, the value of total assets is indirectly estimated. That is, several of the generally accepted unit valuation methods actually estimate the value of debt and equity securities. For these valuation methods, the unit valuation makes a fundamental assumption: that the value of the taxpayer's debt and equity securities equals the value of the taxpayer's total assets.

This assumption may not always be appropriate. This is because some of the factors that influence the value of debt and equity securities do not relate to the value of either tangible assets or intangible assets. However, in order to apply many of the unit valuation methods, the analyst has to make this fundamental assumption.

It is a fundamental relationship in double-entry financial accounting that, for a business enterprise, total assets equal total liabilities plus total owners' equity. Most taxpayer financial statements are prepared on a historical cost basis of accounting. For financial statements prepared on a historical cost basis, this basic financial accounting identity is reversible.

That is, the total assets equal the total liabilities and the total owners' equity. And, the total liabilities and total owners' equity equal the total assets. Once the analyst knows the total balance of one side of the taxpayer's balance sheet, the analyst also knows the total balance of the other side of the taxpayer's balance sheet.

This above-mentioned double entry accounting identity works well for financial accounting. However, this accounting identity has some application limitations for property tax purposes, when value is measured on a historical cost basis. However, when value is measured on a market value (or similar) basis, this accounting identity may not work so well.

Under U.S. generally accepted accounting principles (GAAP), the fair value of an entity's total assets will equal the fair value of its total liabilities and

total owners' equity. This is because the difference between the entity's liabilities and owners' equity and the entity's assets will be recorded as goodwill. Under GAAP fair value accounting, an entity's goodwill is measured by a residual procedure, not by a valuation procedure. This residual procedure does not necessarily measure the fair value (or any other market-derived value) of the taxpayer's intangible assets.

Unit valuations are typically not performed on a historical cost basis. Rather, unit valuations are typically prepared on a market value basis. Therefore, the above-mentioned accounting identity does not always hold for unit valuation purposes.

That is, the market value of the taxpayer's total liabilities and owners' equity may not necessarily equal the market value of the taxpayer's total assets. This is because the market value of liabilities and equity may include value influences in addition to the market value of tangible assets and identifiable intangible assets. These value influences may not represent taxable assets for property tax purposes.

The Unit of Taxpayer Assets

For property tax purposes, the unit of assets of an industrial or commercial taxpayer may be valued using either:

1. summation valuation methods or
2. unitary valuation methods.

If these two sets of valuation methods are consistently applied, both the summation methods and the unitary methods should theoretically achieve the same value conclusion for the assemblage (or unit) of taxpayer assets.

Summation valuation methods are typically used in the appraisal of individual real estate parcels and individual tangible personal property. Taxing authorities typically apply summation valuation methods in the appraisal of locally assessed properties.

In contrast, unit valuation methods are effectively business valuation methods. In all material respects, the analyses conducted in the unit valuation methods are business valuation analyses. Taxing authorities typically apply unit valuation methods in the valuation of centrally assessed taxpayer properties.

The objective of a unit valuation is fundamentally the same as the objective of a business valuation. The valuation approaches, methods, and procedures generally used in both types of valuations are conceptually similar. However, the unit valuation methods focus primarily on the valuation (albeit collective or aggregate) of the taxpayer's assets.

Summation Valuation Methods

Using summation valuation methods, each item (or, at least, each category) of the real estate and real property, tangible personal property, and intangible personal property is individually valued. The value estimates for each of the individual real estate and personal property (tangible and intangible) assets are summed. The sum of the individual property values represents the total value of the taxpayer assets.

Taxpayers, taxing authorities, and analysts often apply summation valuation methods to taxpayer assets. For certain types of taxpayers, however, it is time-inefficient and cost-ineffective to apply the summation valuation methods.

This may be because the collection of taxpayer assets is too large, too complex, too functionally integrated for the analyst (or the taxing authority) to value these assets individually. This may also be because the collection of taxpayer assets crosses over several taxing jurisdictions. In addition, some taxpayer assets physically move (e.g., railroads, airlines, etc.). Therefore, it may not be practical for the taxpayer, the taxing authority, or the analyst to value these assets individually.

Unit Valuation Methods

Unit valuation methods were originally applied in the property tax valuation of transportation, communications, and utility type companies. These categories of industries include railroads and airlines; local exchange, long distance, and cellular telephone companies; gas, water, wastewater, and electric utilities; and oil and gas pipeline companies.

Some taxing jurisdictions have expanded the category of taxpayer that are assessed using the unit valuation principle. These taxing jurisdictions include local (i.e., located within one taxing jurisdiction) but functionally integrated business operations. Examples of locally assessed taxpayers subject to unit valuation methods may include: cable television operators; mining and mineral processing operations; racetracks and sporting facilities; hotel and resort properties; and complex, process-type manufacturing facilities.

One explanation for using the unit valuation principle is that these taxpayers involve integrated and functionally interdependent assets. However, most of these taxpayers operate in an unregulated, competitive economic environment. And, these "unitary" taxpayers typically compete against other taxpayers that are assessed using the summation valuation principle.

Generally Accepted Unit Valuation Approaches and Methods

The three generally accepted approaches to all property valuation are the cost approach, the income approach, and the sales comparison approach. If the taxpayer's assets are valued using unit valuation methods, then these three approaches provide value indications for the total unit of assets.

Cost Approach Unit Valuation Methods

Three common cost approach unit valuation methods are as follows:

1. The reproduction cost new less depreciation method
2. The replacement cost new less depreciation method
3. The original cost less depreciation method

Reproduction cost new represents the total cost associated with acquiring or constructing an asset (whether tangible or intangible) that is the exact duplicate of the subject asset. Replacement cost new represents the total cost associated with acquiring or constructing an asset with the same functionality as the subject asset. In either the reproduction cost new or replacement cost new methods, the total cost measurement typically includes: hard (or direct) costs, soft (or indirect) costs, developer's profit, and entrepreneurial incentive.

All of the cost approach methods also require the recognition of value decrements associated with all forms of depreciation, including physical deterioration, functional obsolescence (including technological obsolescence), and external obsolescence (including economic obsolescence).

In a unit valuation, the cost approach procedures are typically performed in the aggregate—that is, to the taxpayer's total assets. In the unit valuation, original cost (i.e., the accounting gross book value) is sometimes used as a substitute for replacement cost new or reproduction cost new. In addition, a trended original cost measurement is also sometimes used as a substitute for replacement cost new or reproduction cost new. In the trended original cost analysis, the aggregate original cost by year of asset acquisition is trended to the valuation date. This trending procedure is performed by the use of a property-type-specific inflation index.

In a unit valuation, both the cost estimation procedures and the depreciation estimation procedures are typically performed on an overall (or aggregate) basis, not on an asset-by-asset (or property-by-property) basis.

An important procedure in most cost approach methods is the estimation of entrepreneurial incentive and/or economic obsolescence. Entrepreneurial incentive results in an increment to the current cost estimate. Economic obsolescence results in a decrement to the current cost estimate.

These two cost approach components are related economic analyses. Entrepreneurial incentive typically relates to the opportunity cost—or the lost profits—to the taxpayer during the hypothetical property replacement or reproduction period. The economic obsolescence component of external obsolescence often relates to some measure of income shortfall associated with the subject property.

Both of these two cost measurement adjustments are sometimes measured using some form of a capitalized excess earnings/income shortfall method. When the taxpayer property is earning positive excess earnings (compared to an appropriate benchmark measurement), the indicated excess earnings are capitalized. The result of this capitalization procedure is one way to measure entrepreneurial incentive. When the taxpayer property is earning negative excess earnings (compared to an appropriate benchmark measurement), the indicated income shortfall is capitalized. The result of this capitalization procedure is one way to measure economic obsolescence.

In a unit valuation, these economic analysis procedures are typically performed on an overall (or aggregate) taxpayer basis, and not on an asset-by-asset (or property-by-property) basis.

Income Approach Unit Valuation Methods

Two common income approach unit valuation methods are:

1. the yield capitalization method, and
2. the direct capitalization method.

For both income approach methods, income can be measured in several different ways. Common income measures include: net operating income, operating cash flow, before- or after-tax net income, and before- or after-tax net cash flow. In all income approach analyses, there should be consistency between (1) the measurement of income subject to analysis and (2) the selection of the corresponding discount rate and/or direct capitalization rate.

In the yield capitalization method, the selected measure of income is projected for several years in

a discrete projection period. The discrete projection period is often five years, but longer or shorter time periods are not uncommon. A yield capitalization rate (also called a present value discount rate) is estimated. The yield capitalization rate is often based on the band of investment (also called a weighted average cost of capital) procedure. The yield capitalization rate is applied to the discrete income projection in order to conclude the present value of the projected income.

Next, in the yield capitalization method, a residual value (also called a terminal value or a reversionary value) is estimated. The residual value is the estimated value of the taxpayer unit at the end of the discrete projection period. There are several procedures that may be used to estimate the residual value. One common procedure to estimate the residual value is the direct capitalization procedure.

The taxpayer's terminal income subject to this direct capitalization procedure is the "next period" income—that is, the normalized or stabilized level of income for a typical period after the end of the discrete projection period. This projected income is capitalized (as an annuity in perpetuity) by a direct capitalization rate.

The direct capitalization rate is typically calculated as the yield capitalization rate minus an expected long-term growth rate. The expected long term growth rate should correspond to the selected income measure (e.g., net operating income, net income, net cash flow).

This residual value is brought to a present value as of the valuation date. This present value procedure is typically performed using the same discount rate as used in the discrete projection period.

The sum of (1) the present value of the projected income and (2) the present value of the residual value indicates (3) the value of the taxpayer unit.

In the direct capitalization method, the selected income measure is projected for a single future period—that is, for a typical period after the valuation date. This projected income is normalized—or stabilized—in order to represent a typical income level on a forward-looking basis. The objectives of this income stabilization procedure are as follows:

1. To reduce the effects of the taxpayer's business cyclicality

2. To reduce the impact of any abnormal last period projection base

3. To eliminate the effects of nonrecurring or extraordinary income or expense items

The projected income is capitalized by (i.e., divided by) a direct capitalization rate. There are several procedures to estimate the direct capitalization rate. The most common procedure is to estimate the yield capitalization rate and then to subtract an expected long-term growth rate.

One procedure that is sometimes used by taxing authorities is to directly extract an overall capitalization rate from the marketplace, with the marketplace typically defined as either comparable or guideline publicly traded companies. However, the yield capitalization rate minus growth rate procedure is typically more appropriate than the extraction of direct capitalization rates from comparable companies.

The result of dividing the next period stabilized income estimate by the selected direct capitalization rate is an indication of the unit value.

Sales Comparison Approach Unit Valuation Methods

In a unit valuation, some analysts (and many taxing authorities) use the stock and debt method as a sales comparison approach method. In the stock and debt method, the first procedure is to identify the components of the taxpayer's debt and equity capital structure. The capital component analysis identifies all of the classes of the taxpayer's outstanding long-term debt, preferred stock, and common stock.

If the debt instruments are publicly traded, then the market prices of these instruments may be used as a value indication. If the debt instruments are not publicly traded, then guideline publicly traded debt securities (i.e., debt-instruments in the same risk class as the taxpayer) are selected to estimate market-derived interest rates.

The value of the taxpayer's debt may be estimated as a function of:

1. the remaining term of the taxpayer's debt instruments, and

2. the relationship between the stated interest rates of the taxpayer's debt instruments and the market-derived interest rate.

A similar procedure applies to the taxpayer's outstanding preferred stock. The market price of the preferred stock is used as the indication of value if the preferred securities are publicly traded. If the preferred stock is not publicly traded, then guideline publicly traded preferred securities (i.e., preferred stock in the same investment risk class as the taxpayer securities) is selected to estimate market-derived preferred stock dividend rates.

The value of the taxpayer's preferred stock may be estimated as a function of:

1. the relationship between the taxpayer's preferred stock dividend rate, and

2. the market-derived preferred stock dividend rate.

If the common stock is publicly traded, then the stock's market price is used as a value indication. There are various procedures for normalizing the common stock value. One procedure it to use an average stock price over some reasonable time period. Some analysts use a 30-day average stock price. Some analysts use a 90-day average stock price. And, some analysts use the average of the monthly high and low stock prices for the stock over the last 12-month period.

All of these procedures are intended to achieve a normalized common stock value—that is, a stock price that is not influenced by short-term or aberrational deviations in market pricing.

If the common stock is not publicly traded, then comparable or guideline publicly traded common stocks are selected and analyzed. These comparable or guideline stocks should have similar investment risk and expected return characteristics to the taxpayer securities. From the selected sample of guideline publicly traded common stocks (adjusted to make the selected securities as comparative as possible to the subject security), market-derived valuation pricing multiples are calculated.

Some analysts use the reciprocal of the valuation pricing multiple (e.g., a price-to-earnings pricing multiple) to estimate the direct capitalization rate (e.g., an earnings-to-price rate). This direct capitalization rate is applied against the corresponding level of unit income to conclude the common stock value.

In the stock and debt unit valuation method, the sum of the long-term debt, preferred stock, and common stock results in an indication of the total unit value. If the taxpayer includes operations that are not part of the taxable unit, then the value should be allocated between (1) the taxable unit and (2) the taxpayer's other entities (e.g., entities that are not centrally assessed).

This allocation may be based on the relative expected income return (i.e., expressed as either a rate of return or a dollar amount) and relative investment risk of the subject unit to the non-centrally-assessed business operations.

Reconciliation of the Unit Valuation Method Value Indications

The value indications of the unit valuation methods are typically reconciled to conclude a final value estimate. This reconciliation typically involves a quantitative or qualitative weighting of the value indications from each unit valuation method. Among other factors, the weighting is based on the analyst's assessment of the quantity and quality of the data used in each valuation method.

UNIT VALUATION METHODS VERSUS BUSINESS VALUATION METHODS

There is both a conceptual and a practical relationship between unit valuation methods and business valuation methods. The names of the unit valuation methods may be different from the names of the corresponding business valuation methods. These nomenclature differences are more semantic than substantive. The economic principles underlying unit valuation methods and business valuation methods are very similar.

Unit valuation cost approach methods are conceptually similar to the business valuation asset-based approach. In both valuation methods, the subject business tangible assets are adjusted to a current market value. In both valuation methods, the subject business intangible value is identified and quantified. In both valuation methods, intangible value may be measured by some version of a capitalized excess earnings procedure.

In the unit valuation cost approach, this intangible value is typically considered to be entrepreneurial profit if it is a positive balance or economic obsolescence if it is a negative balance. In the business valuation, this intangible value is typically called goodwill if it is a positive balance or negative goodwill (and a reduction of the tangible asset values) if it is a negative balance.

Unit valuation income approach methods are conceptually similar to the business valuation income approach valuation methods. In both methods, the value of the taxpayer is estimated by capitalizing a measure of prospective income. In both valuation methods, the overall capitalization rate represents a risk-adjusted rate of return to all of the investors (both debt holder and equity holders) in the taxpayer business.

In both valuation methods, the common valuation methods involve (1) the present value of a discrete projection of income with consideration to a

residual value at the conclusion of the discrete projection period or (2) the present value of an annuity in perpetuity where the annuity income is typically a stabilized estimate of next period income.

Unit valuation sales comparison approach methods are conceptually similar to the business valuation sales comparison approach methods. In the unit valuation stock and debt method, the values of the debt and equity securities are directly extracted from capital-market-derived public security pricing data. In the business valuation guideline publicly traded company method, the values of the debt and equity securities are estimated by direct reference to capital-market-derived security pricing data.

The objective of the stock and debt method (and of all unit valuation methods) is to estimate the value of the taxpayer's assets. The objective of the guideline publicly traded company valuation method is to estimate the value of the company's debt and equity securities. While the two sets of valuation methods are analytically similar, these two objectives are different.

The Asset Structure Encompassed in the Unit Valuation

Unit valuation methods are intended to value all of the taxpayer's assets. The taxpayer's asset categories typically include the following:

1. Current (financial) assets
2. Tangible assets:
   a. Real estate
   b. Tangible personal property
3. Intangible assets:
   a. Identifiable intangible assets
   b. Intangible value in the nature of goodwill

Not all of these categories of taxpayer assets may be subject to property tax in the particular taxing jurisdiction. The statutory authority of the taxing jurisdiction reveals the particular categories of assets that are subject to property tax. The statutory authority of some jurisdictions provides for a property tax on all categories of assets except for those asset categories that are specifically exempt from taxation. And, the statutory authority of some jurisdictions allows for different assessment percentages (compared to current market value) and for different tax rates for the different asset categories.

The typical taxpayer's current assets include cash, accounts receivables, investment securities, prepaid expenses, and inventory. The typical taxpayer's real estate includes land, site improvements,
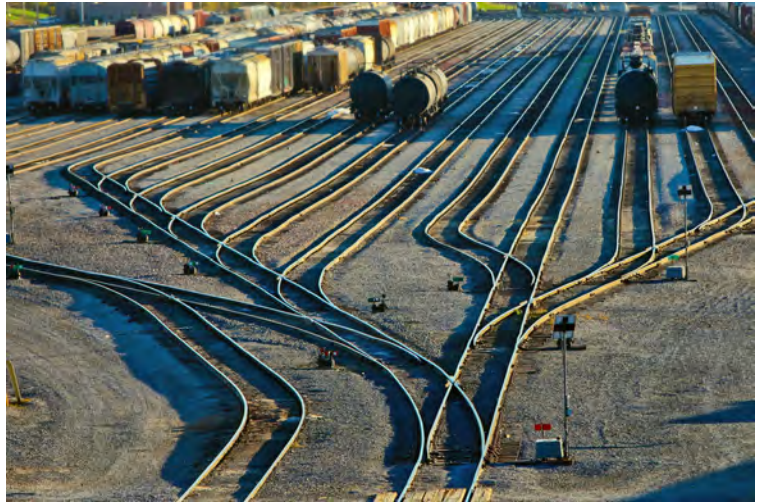
buildings, and building improvements. The typical taxpayer's tangible personal property includes machinery and equipment, storage and warehouse equipment, vehicles and transportation equipment, office furniture and fixtures, and computer equipment.

The typical taxpayer's identifiable intangible assets include intangible personal property—such as contracts, licenses, permits, trademarks and trade names, patents, copyrights, computer software, employee relationships, supplier relationships, and customer relationships.

Intangible value in the nature of goodwill is sometimes defined as the present value of future income not associated with any of the taxpayer's other tangible or intangible assets. That is, intangible value in the nature of goodwill is not associated with any of the taxpayer's tangible or intangible assets currently in place as of the valuation date.

Goodwill could relate to the sale of future products that have not yet been developed by the taxpayer as of the valuation date. Goodwill could relate to sales to future customers that are not yet known to the taxpayer as of the valuation date. And, goodwill could relate to future income generated from physical plant and facilities not yet constructed by the taxpayer on the valuation date.

Goodwill could even relate to the future income to be earned from investors' expectations of future mergers and acquisitions that are not yet consummated by the taxpayer on the valuation date. Accordingly, intangible value in the nature of goodwill indicates the value of the taxpayer's assets (whether tangible or intangible) that are not yet in existence as of the valuation date.

The sum of all of the taxpayer's current assets, tangible assets, and intangible assets is total asset structure included in the unit valuation.

The Capital Structure Encompassed in a Business Valuation

Business valuation methods consider the content of the typical capital structure of the subject business. The taxpayer's capital structure typically includes the following types of capital components:

1. Current liabilities
2. Long-term debt
   a. Unsecured debt instruments
   b. Secured debt instruments
3. Preferred stock
4. Common stock

The taxpayer's current liabilities typically include: salaries payable, accounts payable, notes payable, taxes payable, and accrued expenses. The taxpayer's long-term debt category typically includes: bonds payable, notes payable, mortgages payable, and debentures payable.

The preferred stock includes all classes of the taxpayer's preferred stock outstanding. And, the common stock includes all classes of the taxpayer's common stock outstanding. Also, implicit in the common stock value is the value impact of contingent liabilities.

Contingent liabilities are the unrecorded liabilities associated with environmental, litigation (including employee, product, and general commercial), taxation, and potential bankruptcy issues. These contingent liabilities have the effect of reducing the value of common stock. That is, investors implicitly consider the likelihood, amount and timing of these contingent liabilities in their pricing of common stock.

The sum of all of these debt and equity capital components represents a typical capital structure. Accordingly, the final value conclusion is synthesized from the application of business valuation methods. This final value conclusion represents the value of all of the capital components. The result of business valuation methods concludes the value of the debt and equity securities. In contrast, the result of unit valuation methods concludes (or, at least, is supposed to conclude) the value of the real estate and personal property (tangible and intangible).

THE UNIT SUBJECT TO PROPERTY TAX

The definition of the unit of assets subject to property tax in each jurisdiction is a matter of statutory authority, administrative ruling, and judicial precedent. It is a question that should be answered on a jurisdiction-by-jurisdiction basis. In some states, the definition of the unit subject to property tax is unambiguous. In other states, however, the statutes, rulings, and precedent related to the definition of the taxable assets are ambiguous.

In some jurisdictions, there is uncertainty on the parts of—and controversy between—the parties in a tax dispute as to what exactly is included in (or excluded from) the unit subject to property taxation. In most jurisdictions, only assets in place as of the valuation date are subject to property tax. This distinction between assets in place and future assets sometimes becomes controversial when the taxing authority attempts to include the taxpayer's goodwill in the unit value.

This distinction relates to the fact that the assets included in the unit may include the taxpayer's goodwill. And, the goodwill includes the value of both the taxpayer's tangible and intangible assets not yet in existence as of the valuation date.

Accordingly, it is important for taxpayers, taxing authorities, and analysts to understand the composition of the assets that are encompassed in the unit valuation. Those assets that should be excluded for legal reasons from the taxable unit should be removed from the unit value.

Nontaxable assets (or taxpayer assets exempt from property tax) are an important element in the reconciliation of:

1. the taxpayer unit (as estimated by the unit valuation) and
2. the portion of the unit that represents taxable assets in the taxing jurisdiction.

PERFORMING THE UNIT VALUATION ANALYSIS

The methods that may be used in the unit valuation of taxpayer assets depend on (1) the statutorily determined standard (or definition) of value and (2) the appropriate premise of value (as determined by either statutory authority or the analyst's highest and best use analysis). The following discussion summarizes the application of the generally accepted unit valuation methods.

Several cost approach methods consider replacement as an indicator of value. A prudent investor would pay no more for a unit of fungible operating assets than the amount for which that investor could replace the assets new, less the value of any betterments. In the cost approach, an estimation of either replacement cost new or reproduction cost new (collectively referred to herein as RCN) is often made. This RCN estimate is then adjusted for all

forms of observed obsolescence in order to value the taxpayer assets.

In the sales comparison approach methods, recent sales of comparative units of assets are gathered. Adjustments are applied to these transactional pricing data in order to account for differences in location, time of sale, physical characteristics, and so on, between the taxpayer unit of assets and the comparative units of operating assets. The adjusted transactional data are analyzed in order to extract market-derived pricing indicators.

In the income approach methods, the analyst quantifies the present worth of the expected future economic benefit (e.g., net income or net cash flow) from the ownership of the taxpayer unit of operating assets. The net income or net cash flow is projected over an appropriate period and is then capitalized at either an appropriate direct capitalization rate or discount rate. The direct capitalization rate or discount rate should consider (1) the time value of money, (2) the expected price inflation, and (3) the operational risk inherent in the taxpayer assets.

When properly applied and documented, these three categories of methods provide the basis for the unit valuation of taxpayer assets.

COST APPROACH METHODS

The cost approach methods measure value by (1) estimating the current cost to replace or reproduce (or, sometimes, the original cost of) the unit of assets and (2) subtracting deductions for various components of depreciation. Common cost approach methods apply the following formula:

Replacement cost, reproduction cost, or original cost
less
Physical deterioration
less
External obsolescence
less
Functional obsolescence
results in a
Value indication

The RCN represents the amount of money, in terms of current labor and material, needed to construct or to acquire new assets of similar utility to the taxpayer unit. Similar utility refers to similar economic satisfaction. That is, the substitute assets should be perceived by the owner/operator as being equivalent to the unit of assets.

The measurement of replacement cost new is not the same as the measurement of reproduction cost new. Reproduction cost new is the cost to reproduce the unit in like kind—that is, to obtain a bundle of assets that is nearly an exact duplicate of the taxpayer's assets. Normally, over time, the subject assets will become less than the perfect replacement for themselves.

While reproduction cost contemplates the construction of an exact replica of the subject assets, replacement cost contemplates the cost to recreate the functionality or utility of the subject assets. Therefore, when the analyst estimates the replacement cost new, the form or appearance of the replacement assets may be very different from the subject assets. The cost components of any cost approach analysis typically include all elements of material, labor, overhead, developer's profit, and entrepreneurial incentive.

Adjustments are made to the replacement/ reproduction/original cost estimate in order to account for losses in value resulting from (1) physical deterioration, (2) functional obsolescence, and (3) external obsolescence. These three types of property obsolescence are summarized below:

■ Physical deterioration is a loss in value brought about by wear and tear, action of the elements, disintegration, use in service, and all physical factors that may reduce life and serviceability.

■ Functional obsolescence is the loss in value caused by the inability of the subject property to adequately perform the function for which it is utilized. Functional obsolescence is, therefore, internal to the subject property. Functional obsolescence is often related to such factors as property superadequacies, excess property operating costs, and property inadequacies.

■ External obsolescence is a loss in value caused by external forces, such as changes in the supply/demand relationship, legislative enactments, and other external factors. Those other external factors may include industry and local economic conditions that impact the value of the subject property.

Another cost approach procedure typically involves consideration of the remaining useful life (RUL) for the taxpayer's assets. This RUL may be based on the assets' average existing age, quality, and condition. This RUL estimate may influence the allowances for each form of obsolescence.

In order to quantify the loss in value due to physical deterioration, the analyst typically segregates the two components of this form of depreciation.

The first component of physical depreciation is service life. As an asset is placed in service and it begins to age, its service life is impaired or reduced. Therefore, there is a reduction in value due to the fact that the asset has a decreasing RUL throughout its service.

The second component of physical depreciation is serviceability. Serviceability refers to the utility of the unit of assets.

In quantifying functional obsolescence, a portion of the property obsolescence (e.g., excess capital costs and/or excess capacity costs) may be eliminated by using a replacement cost (versus reproduction cost) new measure. However, other adjustments for functional obsolescence may be necessary in the cost approach. These additional functional obsolescence adjustments may be made by:

1. quantifying any excess operating costs associated with the subject property and capitalizing these excess costs over the RUL of the property or

2. identifying functional inadequacies related to the property and assigning an appropriate economic penalty.

External obsolescence is a loss in value due to external forces unrelated to the taxpayer's assets. The locational obsolescence component of external obsolescence is usually not a factor in a unit valuation. Rather, locational obsolescence may be a material component of external obsolescence in a summation valuation.

The economic obsolescence component of external obsolescence is often an important component of a unit valuation. Economic obsolescence may exist any time the taxpayer cannot earn a fair rate of return on the subject unit. That is, economic obsolescence may exist any time there is an income shortfall associated with the assets.

It is sometimes difficult to assign an income stream to individual assets. Therefore, economic obsolescence is typically assigned in aggregate—and not on an individual asset-by-asset basis.

SALES COMPARISON APPROACH METHODS

In the sales comparison approach, the analyst researches recent sales of similar bundles of assets in order to arrive at a selling price indication for the subject unit. The basic procedures in such an analysis include: gather data, determine the unit of comparison parameters to be compared, and apply the results to the taxpayer's unit.

The analyst may derive a sales comparison approach value indication by (1) estimating the market price to purchase the subject assets in the appropriate secondary market and (2) then adding sales tax, freight, installation, and utility connection costs.

Using the sales comparison approach, it is sometimes possible to arrive at a value indication based on sales of identical assets that have exchanged hands in the appropriate secondary marketplace. However, the specific configuration of the subject assets often makes it difficult for the analyst to obtain data on the sale of comparable asset bundles.

In practice, the analyst may have to consider the sales of similar, or guideline, bundles of operating assets in the appropriate secondary marketplace. In addition to the configuration of the guideline asset bundles, the following list presents some of the parameters that the analyst may consider for purposes of assessing the comparability of the taxpayer assets to the comparable sale assets:

- Average of the bundle of assets
- Average condition of the bundle of assets
- Upgrades or other deviations from standard model assets
- Location of the subject sale
- Market conditions at the time of the sale
- Motivation for the sale
- Quantity of operating assets sold in the unit
- Time of the sale
- Type and terms of the sale
- Sale price for the bundle of assets

Each comparability parameter may be more or less important in a particular valuation. Depending on the appropriate standard of value and the premise of value, factors that add value in use may be identified and included in the value estimate. For most assets, such factors may include: freight, installation, connections, test-batch loading and debugging, and any other indirect costs required to commission and hand over the bundle of assets to the willing buyer owner/operator.

When applying the sales comparison approach, the analyst may perform the following procedures:

1. Research the appropriate secondary market to obtain information on sale transactions related to comparative bundles of assets.

2. Verify that the sale transaction pricing data are factually accurate and that the sale transactions reflect arm's-length market considerations.

3. Collect appropriate additional information regarding current secondary market conditions and industry economics. Such information may include the conditions both (a) at the time of the guideline property sales and (b) at the time of the unit valuation.

4. Quantify the relevant comparison parameters of the guideline sale operating assets to the subject taxpayer's unit property; such comparison parameters may include average age, average condition, quantity of operating assets sold, time of the sale, type of the sale, terms of the sale, etc.

5. Using these comparison parameters, adjust the sale price of the guideline sale transactions in order to approximate the status of the taxpayer's assets.

6. Apply the adjusted guideline sale prices to arrive at a preliminary indication that reflects the relative age and condition of the taxpayer's assets.

7. Compute any direct and indirect expenses (such as sale taxes, freight, installation, etc.) that may be required to adjust the comparative transaction sale prices to the appropriate premise of value for the subject unit valuation. Make any appropriate adjustments to the comparative transaction sale prices in order to reflect the relative age of the taxpayer's assets.

8. Add any appropriate direct and indirect expenses to the preliminary value indication to conclude a value indication for the taxpayer unit of assets.

INCOME APPROACH METHODS

The income approach methods provide a framework for estimating value based on either the direct capitalization or the present value of income derived from the use, forbearance, license, or rental of the assets.

In the income approach methods, income can be measured as:

1. gross or net rental income,
2. gross or net license income, or
3. gross or net operating cash flow.

In the income approach methods, the average RUL of the assets is a consideration. Typically, the income projection should not extend the expected average RUL of the subject assets.

The service life of the assets is typically measured as the period of time extending from the property's date of installation to the property's retirement from service. Many factors affect the useful life of assets. Some of these factors (and the type of RUL measurement that these factors affect) include the following:

1. Usage (physical)
2. Age when acquired (physical)
3. Maintenance and downtime (physical)
4. Technological improvements (functional)
5. Progress in the subject industry state of the art (economic)
6. Changes in industry competitive economics (economic)
7. Regulatory and other legal changes (economic)
8. Other factors

The income approach measures the present worth of the future economic benefit expected from the ownership/operation of the assets. The different income approach methods include (1) methods that rely on direct capitalization and (2) methods that rely on yield capitalization.

In the direct capitalization methods, a normalized measure of income is (1) estimated for one typical period (future to the valuation date) and (2) then divided by an appropriate rate of return on investment. Direct capitalization methods lend themselves to the analysis of assets that will generate income for an infinite (or, at least, a very long) period of time.

In the yield capitalization methods, the appropriate measure of income is first projected for a discrete time period. The income projection is

converted to a present value by the use of a present value discount factor—that is, the required rate of return over the expected term of the income projection. Yield capitalization methods more readily apply to the valuation of limited-life assets.

One consideration in the typical yield capitalization method is the estimation of average RUL. Typically, the average RUL is the shortest of the physical, functional, technological, or economic life for the taxpayer assets. In other words, the income stream is typically projected over the shortest of the average RUL of the taxpayer assets.

Another consideration in the typical yield capitalization method is the analysis of the amount of income expected to be generated by the unit. In this procedure, the analyst considers only the amount of income related to the ownership of the assets. The amount of income expected by the taxpayer may be measured as the rental income that could be earned from the rental of the assets in an arm's-length rental/lease transaction. For leased assets, the expected rental income is directly influenced by the amount of rent that the asset operator (i.e., the lessee) actually pays to the asset owner (i.e., the lessor).

If the subject assets are owner-operated, then the income analysis is more complicated. In this case, the analyst would estimate the amount of market-derived rental income that the property owner (i.e., the lessor) would receive from the property user (i.e., the lessee) if the assets were to be the subject of an arm's-length rental/lease transaction.

This income analysis may include a search of the marketplace for rental income data with regard to guideline leased assets. The selected guideline rental property may not be identical to the taxpayer's property. The guideline rental property may be larger/smaller, newer/older, used in a different industry, located in a different geographic area, etc.

Most of these differences between the taxpayer's property and the guideline leased property generally can be accommodated through a series of incremental or decremental adjustments to the guideline rental data. These adjustments (to make the guideline leased assets more comparative to the taxpayer's assets) are typically made in the rental transaction "adjustment grid." These adjustments may consider such factors as relative age, relative size, relative capacity, power plant, power source, and so on.

In order to estimate the future income associated with owner-operated assets, the expected income of the taxpayer assets is analyzed. The future income and expense of the taxpayer assets are estimated after researching and analyzing the following:

1. The income and expense history of the taxpayer assets

2. The income and expense histories of guideline assets

3. Recently signed rental agreements, proposed rental agreements, and asking rents for the taxpayer's property and for the guideline properties

4. Actual rental levels for the taxpayer's property and for guideline properties

5. Maintenance expenses for the taxpayer's property and guideline properties

6. Published industry operating data

7. Current market expectations related to the taxpayer's property

8. Projected replacement allowances for any taxpayer assets that will wear out and will have to be replaced

These categories of income and expense data are more available for assets that are typically leased, such as computers, railroad rolling stock, and commercial aircraft.

Another consideration in the yield capitalization method is to estimate the appropriate present value discount rate. That discount rate should provide a fair, risk-adjusted return on the subject assets over the assets' average RUL. The mathematical relationship between the yield capitalization rate and the direct capitalization rate is expressed as follows:

Direct capitalization rate =

Yield capitalization rate – Expected long-term growth rate

TYPICAL UNIT VALUATION PROCEDURES

Within each unit valuation approach and method, there are individual procedures that the analyst may perform. Some of these unit valuation procedures are summarized below.

The first category of procedures is common to most valuation methods. Some of the procedures in the second category are common to all valuation methods. Some of the procedures in the second category are only appropriate to certain valuation methods. All of the procedures in the third category are specific to the indicated valuation methods.

As with all valuation procedures, the analyst should perform the procedures as thoroughly as possible. However, it is not always possible for the analyst to perform (or to complete) every procedure in every unit valuation.

Often, there are client scope of work restrictions that limit the analyst's ability to perform all of the typical procedures. Often, there are property access and data access considerations that limit the analyst's ability to perform every procedure. And, the data related to certain valuation variables may not be available and/or the procedure may not be relevant to the particular valuation.

In the unit valuation, the following procedures are usually performed on an aggregate basis. That is, the analyst performs a valuation of the total taxpayer assets.

Category I: Asset Inventory and Inspection Procedures

The first category of procedures in the unit valuation includes: (1) obtaining the owner/operator listing of the subject assets, (2) confirming the existence of the subject assets within the confines of the taxpayer unit, (3) considering the accuracy of the continuing property record data related to the unit of assets, and (4) considering the overall condition of the unit of taxpayer assets.

Procedure 1: Obtain the Taxpayer Property Accounting Asset Listing

The analyst typically starts with the property owner's asset listing regarding the taxpayer operating assets. The analyst typically obtains the asset listing that is prepared "as of" a date as close as possible to the valuation date.

Procedure 2: Confirm Existence of the Taxpayer's Assets

The analyst may perform the following tests of inclusion and exclusion with regard to the property listing.

1. Verify that a reasonable sample of the operating assets included on the property list are, in fact, in existence.

2. If there are assets included on the asset listing that are no longer in use in the taxpayer's operations, then they should be removed from the continuing property record listing.

3. Verify that a reasonable sample of the assets in use (i.e., physically located at the taxpayer facilities) are, in fact, included in the continuing property listing.

4. If there are operating assets observed during the tests of inclusion and exclusion that are excluded from (or not in) the con-

tinuing property record listing, then they should be added to the property listing.

5. The result of these aggregate data verification and asset inclusion/exclusion procedures should be an accurate and verifiable continuing property listing.

Procedure 3: Consider the Accuracy of the Continuing Property Record Data Related to the Overall Unit

The data on the continuing property record listing may be verified through discussions with operations, maintenance, engineering, or plant accounting representatives. The analyst may request assurances or representations from the operations or accounting management with regard to the following continuing property records data:

1. The continuing property record operating asset listing number

2. Taxpayer asset identification number or bar code

3. The asset manufacturer and country of origin

4. The general category of the asset

5. The specific type of the asset

6. The model number of the asset

7. The serial number of the asset

8. The date of manufacture of the asset

9. The location of the asset including building address, room number, department number, etc.

10. The capacity of the asset against model specifications

11. Any internal upgrades or enhancements to the asset against model standards

12. Any appurtenances and other external peripherals attached to the asset

13. Appurtenances that have been identified and noted separately in the continuing property record listing

14. The last plant asset physical inventory date

15. The date that the asset was put into service.

Procedure 4: Consider the Average Condition of the Property within Each Asset Category

The analyst may consider the condition, maintenance, and operating environment of the assets through discussions with operations, maintenance, engineering, or accounting representatives. In such discussions with management, the analyst may consider the following property condition factors (on

either an aggregate basis or an asset category by category basis):

1. The condition of the assets, including consideration of physical deterioration, wear and tear, etc.

2. The adequacy of the property operating environment

3. The usage of the typical bundle of taxpayer assets including:

    a. percent of time per period of continuous use, and

    b. number of operators using the assets during a given period.

4. The existence of any maintenance agreement for the assets and the maintenance logs for the assets, including consideration of:

    a. the number of operator complaints,

    b. the severity of operator complaints,

    c. how operator complaints are rectified, and

    d. the existence of recurring operations problems.

Category II: Operating Asset Data Collection and Analysis

The continuing property record listing may contain such information as the original cost of the assets within the unit, the date each asset was placed into service, and the accumulated financial accounting depreciation related to each asset. The first two procedures are common to all valuation methods.

Procedure 1: Discuss the Type of Data Included in the Continuing Property Record Listing with Management

The analyst may discuss with the operations or accounting management the accuracy of the continuing property records data, including the following data considerations:

1. The original cost of the assets with respect to an actual purchase order

2. The original cost of the assets with respect to the paid invoice amount

3. The purchase order date

4. The invoice date

5. The date when each asset was received at the taxpayer facility

6. The date when each asset was placed into service

7. Any sales tax that was included on the asset paid invoice

8. Any freight, insurance, or other delivery expenses that were included on the asset paid invoice

Procedure 2: Discuss the Type of Historical Cost Information That Is Captured in the Continuing Property Record with Management

The analyst may discuss with the operating, purchasing, maintenance, or accounting management the type of cost data that are included in the property record, including consideration of the following cost components:

1. Installation costs—set-up costs on the basis of the normal amount of time required for various set-up activities, including (a) unpacking and checking and (b) making necessary power, gas, water, and other internal and/or external connections.

2. Special requirements expenditures—expenditures required specifically for the assets to work efficiently, such as high power source wiring, dust-free air equipment, special installation, etc.

3. Commissioning expenses—start-up expenses related to the normal amount of time required for various start-up activities including, for example, loading necessary systems and applications software, process debugging, and hand over to the property operator.

Procedure 3: Collect the Data Necessary to Perform the Selected Valuation Analyses

The analyst typically considers these data collection procedures with respect to each valuation method.

Data Related to the Cost Approach Replacement Cost New Less Depreciation Method

For each category of assets (usually on the basis of SIC code) in the continuing property record listing, the analyst may research the appropriate price, production, and cost indices. Common sources of such indexes include the Statistical Abstracts of the United States, the Marshall & Swift Valuation Guide, and others.

An index—for price, cost, materials, wages, production, and so on—is a calculation for reporting the relative changes in the price or cost of items or groups of items over a period of time.

Data Related to the Sales Comparison Approach Direct Sales Comparison Method

For the overall bundle of assets, the analyst may research transaction pricing data with regard to actual sales of guideline units of seasoned assets. Guideline units of assets generally have these same characteristics:

1. Manufacturers and countries of origin
2. General categories of assets
3. General types of assets
4. Numbers of assets
5. Average dates of manufacture (or average age) of the operating assets

If sales data related to sufficiently comparative assets are not available, then the analyst may reconsider the applicability of the sales comparison approach with respect to the unit valuation.

If there are actual sales of sufficiently comparative assets, then the analyst may investigate and confirm the following information with regard to each guideline transaction:

1. The actual market price for each guideline sale transaction
2. The time (month and year) of each guideline transaction
3. The location of the sale transaction
4. The average condition of the guideline assets
5. Any upgrade or changes from the standard specifications of the typical assets within the guideline unit
6. Any unrelated property (e.g., nonoperating assets, nontaxable assets) included/excluded in the guideline sale transaction
7. Any special terms and conditions of the guideline transaction

The analyst's search for guideline sale transactions may include the following steps:

1. Researching publicly available industry or competitor company data
2. Licensing, renting, or buying privately developed transaction databases
3. Gathering information from reputable and knowledgeable investment bankers or business brokers

Data Related to the Income Approach Yield Capitalization Method

For the unit of total assets, the analyst may research transactional data with regard to the actual rental or lease of guideline assets. If guideline rental transaction data are not available, then the analyst may want to reconsider the applicability of the yield capitalization method in the unit valuation.

For each rental or lease of guideline assets, the analyst may consider the terms and conditions of the rental/lease agreement, including the following:

1. The term of the lease agreement
2. The amount of rent payable for each period of the term
3. The inclusion of any penalty clause, with the amount of the penalty
4. The inclusion of any asset purchase clause, with the contractual purchase price

For each guideline rental transaction, the analyst may consider the following data:

1. The rental history regarding the guideline assets
2. The maintenance history including maintenance expense regarding the guideline assets
3. The guideline assets' general and administrative expense
4. The guideline assets' marketing and advertising expense

Also, the analyst may consider the following capital market and economic factors in the derivation of the appropriate yield capitalization rate:

1. The prevailing risk-free rate of return

2. The amount of any additional unit-specific risk premium

3. The expected long-term inflation rate

Procedure 4: Analyze the Data Necessary to Perform Each Selected Valuation Method

The analyst may consider the following cost approach, sales comparison approach, and income approach analyses.

Analysis Related to the Cost Approach Replacement Cost New Less Depreciation Method

Using a cost, price, or production index for the industry, the analyst may use cost "inflation" trending factors for each vintage group of assets. The cost new for each operating asset vintage group is estimated by multiplying the historical cost of the assets within the vintage group by the appropriate age-dependent cost trending factor.

Next, the analyst may estimate the average age of each property category. Based on (1) property-specific statistical studies or (2) published information regarding the effective life of property in the taxpayer industry, the analyst may estimate the assets' average RUL. Using this RUL estimate as a proxy, the analyst may estimate the "percent good." This percent-good factor takes into account the normal physical depreciation of the taxpayer's assets.

For the analyst's observations regarding the condition, maintenance, and operations of the assets, the costs and expenses that would be required to bring the existing assets to state-of-the-art condition—or the costs required to operate with below state-of-the-art assets—are estimated. This is one consideration for measuring functional obsolescence.

The analyst may also research the taxpayer's industry, including consideration of any government regulations, the demand of the product, the supply of the raw material, and the status of competitive products. The input from these industry considerations may lead to the identification and quantification of economic obsolescence. There may be other marketplace influences (not related to the taxpayer's industry) that may cause economic obsolescence.

Analysis Related to the Sales Comparison Approach Direct Sales Comparison Method

Adjustments to the transactional sale price may be made for any changes from the specifications and information regarding the assets. The analyst may study the selected sales of guideline assets in order to adjust each guideline sale transaction price for the following differences between the taxpayer unit and the guideline sale unit:

1. The average year of manufacture installation (i.e., the average age of the assets)

2. The types of manufacturers and the asset specifications

3. The time of each actual sale and the valuation date

4. The location of each actual sale and the location of the subject assets

5. The average condition of the guideline assets relative to the condition of the subject assets

6. Any additions and/or deletions to the average specifications of the guideline assets and the average specifications of the subject assets

7. Any special terms and conditions of the guideline sale transactions in order to reflect the sale of a fee-simple interest

The analyst may conclude an adjusted sale price for each sale of guideline assets giving due consideration to the adjustment factors listed above.

Analysis Related to the Income Approach Yield Capitalization Method

The analyst may estimate the market-derived normalized—or stabilized—annual rental income related to the taxpayer assets. The analyst may also estimate the maintenance, marketing, and other administrative expenses related to the assets.

The analyst may project the net operating income associated with an actual or hypothetical rental related to the taxpayer assets. Next, the analyst may project the average RUL.

Finally, the analyst may develop present value discount factors from the selected present value discount rate. The present value discount rate is based on the analyst's consideration of the asset-specific risk factors associated with the taxpayer assets.

Category III: Valuation Synthesis and Conclusion

The analyst may develop a value indication from each applicable valuation approach and method.

The analyst may then reconcile the various value indications and synthesize a final value conclusion related to the unit.

Value Indication for the Cost Approach Reproduction Cost New Less Depreciation Method

A value indication for the taxpayer unit may be developed based on the following procedures:

Historical cost

times

Trend factor

equals

Reproduction cost new

less

Physical depreciation

equals

Reproduction cost new less depreciation

less

Functional obsolescence

less

External obsolescence

equals

Unit value indication

Value Indication for the Income Approach Yield Capitalization Method

A value indication of the taxpayer unit may be developed based on the following procedures:

Normalized income

times

Corresponding present value discount factor

equals

Discounted income

Sum of discounted income

over

Average RUL of taxpayer assets

equals

Unit value indication

Valuation Synthesis and Conclusion

If more than one valuation approach is applicable, then the analyst should give appropriate weight to the various value indications in order to conclude a final unit value conclusion. This appropriate weight assigned to each value indication should be based on the:

1. quantity and quality of data analyzed in each applicable valuation method,

2. analyst's confidence in the developed variables and projections, and

3. analyst's personal experience with the taxpayer industry.

The analyst typically assigns appropriate weights to the various value indications in order to calculate a final value estimate. This final value estimate is then rounded in order to conclude the value of the taxpayer unit.

SUMMARY

The above discussion summarized the application of the generally accepted approaches, methods, and procedures to the typical unit valuation of taxpayer assets. Within each unit valuation approach, several unit valuation methods were discussed. And, within each unit valuation method, individual valuation procedures was described.

This is the typical process in the unit valuation of taxpayer assets. After all of the valuation approaches and methods are performed, the analyst reconciles the various value indication into a final value conclusion. This final value conclusion is a function of the quantity and quality of available data, the experience and judgment of the analyst, the purpose and objective of the valuation, the appropriate standard (or definition) of value, and the appropriate premise of value.

CURRENT ISSUES IN UNIT VALUATION

Income approach methods are commonly used in unit valuations. The income approach methods typically fall into two categories: the yield capitalization method and the direct capitalization method. In the unit valuation, some analysts use valuation variables (particularly direct capitalization rates) that are directly extracted from publicly traded guideline company stock prices and price/earnings multiples.

This discussion summarizes some of the issues related to the direct use of stock market data in the direct capitalization method for unit valuation purposes. And, this discussion describes some of the reasons why analysts typically prefer the yield capitalization method over the direct capitalization method in the unit valuation.

Yield Capitalization Method Issues

In the yield capitalization method, both the measurement of income and the yield capitalization rate are intended to be specific to the subject unit. The discrete period income projection is based on the analyst's best estimate of the prospective income generation of the taxpayer's assets. The analyst estimates the yield capitalization rate (i.e., the present value discount rate) based on a risk and expected return analysis of the taxpayer's assets—compared to all other classes of investment opportunities.

In the yield capitalization method, the income projection can accommodate cyclical changes in taxpayer income. It can accommodate uneven expected rates of change in the future income. And, it can even accommodate an expected fundamental change in the future income of the unit.

In the yield capitalization method, the yield capitalization rate is typically based on a weighted average cost of capital (WACC)/band of investment procedure. And, the cost of equity component of the WACC is typically based on the capital asset pricing model (CAPM). The CAPM estimates a cost of equity capital based on risk and expected return metrics that are applicable to the taxpayer's assets.

Direct Capitalization Method Issues

In the direct capitalization method, the income subject to capitalization should relate directly to the unit. Other than for differences in projected growth rates, the income projection used in the yield capitalization method should not be fundamentally different from the income projection used in the direct capitalization method.

The procedure that some analysts use to estimate the capitalization rate is fundamentally different in the yield capitalization method than in the direct capitalization method. Most analysts use some version of the CAPM, at least in part, to estimate the yield capitalization rate cost of equity capital component. As some analysts apply the direct capitalization method, the cost of equity capital component is extracted directly from the stock prices and the stock price/earnings multiples of selected guideline publicly traded companies.

Using this direct capitalization rate estimation procedure, all of the investment attributes of publicly traded stocks are taken into account in the capitalization rate. This is true even if the taxpayer assets do not enjoy any of the investment

attributes of publicly traded stocks. Some of the differences in the investment attributes of publicly traded stocks compared to taxpayer assets are listed in Exhibit 1.

When the direct capitalization method extracts rates directly from stock market prices, the analyst should consider two issues:

1. The selected guideline properties (i.e., publicly traded securities) should be directly comparable to the taxable property (i.e., the taxpayer unit).

2. Any investment attributes associated with the publicly traded securities will be included in the valuation of the taxpayer assets.

These two issues do not invalidate the use of yield capitalization rates derived from the CAPM. These two issues do raise concern when the analyst extracts the direct capitalization rate directly from guideline company stock prices. The use of CAPM-derived yield capitalization rates mitigates the concern related to the use of the yield capitalization method for the unit valuation.

With regard to the income subject to capitalization, the direct capitalization method allows for the estimation of a single-period stabilized income projection. Because this income estimation is for a single period, the income cannot vary over time. In other words, the direct capitalization method does not allow for:

1. any expected cyclical changes in the unit income or

2. any expected changes in the unit income that is not represented by a constant growth rate.

The estimation of the single-period stabilized income is an important consideration in the direct capitalization method. It is often difficult to project this stabilized income for the taxpayer unit. For example, careful analysis is required to determine if the stabilized income subject to capitalization should be based on:

- the taxpayer's last year actual income,

- an average of the last three years of the taxpayer's actual income,

- an average of the last five years of the taxpayer's actual income, or

- some other base period of the taxpayer's actual income.

Exhibit 1
Differences in the Risk and Expected Return Investment Attributes
Between Publicly Traded Stocks and Taxpayer Assets

1. Lack of marketability/liquidity—Stocks are perfectly liquid. Taxpayer assets are extremely illiquid.

2. Capital reinvestment calls—Public stock investors do not expect to have to make continuing investments in their stock investments. Taxpayers are often required to make continuing (and substantial) investments in their assets.

3. Investment time horizon—Public stock investors have a very short investment time horizon. Taxpayers have a very long time horizon for investments in operating assets stocks; in many industries, there is a great deal of regulation as to how investors can use or dispose of assets.

4. Regulatory risk—There are few regulations that limit an investor's ability to sell publicly traded stocks. In many taxpayer industries, there is a great deal of regulation as to how investors can use or dispose of assets.

5. Limited/unlimited risk—Public stock investors can never lose more than their original investment. The value of taxpayer assets could turn negative due to a large litigation award, bankruptcy declaration, environmental liability, etc.

6. Diversification—Public stock investors can easily diversify their investment portfolio. Taxpayers often invest all of their assets in one industry.

7. Wealth concentration—Public stock investors can invest in many different types of investment instruments. Taxpayers invest all of their corporate wealth in operating assets.

8. Transaction costs—Investors can buy and sell publicly traded stocks at very low transaction (i.e., brokerage) costs. Taxpayers incur high brokerage costs to sell operating assets.

9. Market efficiency/inefficiency—Investors can sell publicly traded stocks quickly at a known market price. Taxpayers face an unknown price when they sell their assets.

10. Investment depreciation versus investment appreciation—Investors expect publicly traded stocks to appreciate over time. Taxpayers expect assets to depreciate over time—and to require constant reinvestment/replenishment.

DIRECT USE OF STOCK PRICES TO EXTRACT CAPITALIZATION RATES

The procedure of directly extracting direct capitalization rates from publicly traded company stock prices creates two comparability concerns:

- The selected companies from which capitalization rates are directly extracted are often not sufficiently comparable to the taxpayer unit so as to provide any meaningful capitalization rate guidance.

- The selected guideline company stock price and price/earnings data relate to liquid securities that trade on extremely efficient capital markets; in contrast, the taxpayer unit includes illiquid assets—assets that do not trade on an organized or efficient market.

From an investment risk and expected return perspective, there is a fundamental lack of comparability between the stock price and price/earnings data used to extract the direct capitalization rate and the assets subject to property tax.

There are generally accepted comparability criteria and generally accepted criteria for identification and quantification of adjustments when analysts use the direct capitalization method in a summation valuation of real estate and tangible personal property. Adjustments to the selected comparable properties are made to increase their comparability to the taxpayer properties.

However, many analysts do not follow these comparability and adjustment criteria when using the direct capitalization method for unit valuation purposes. If such criteria are not followed, the results of the unit valuation may be unreliable.

The direct use of stock price and price/earnings data may affect the reliability of both the direct capitalization method and the stock and debt method for unit valuation purposes. This is true when these methods directly use public company stock prices and price/earnings multiples to extract direct capitalization rates.

ANALYTICAL PROBLEMS WITH DIRECT USE OF STOCK PRICES AND PRICE/EARNINGS MULTIPLES

There are concerns associated with the direct use of stock price and price/earnings multiple data

to extract capitalization rates for unit valuations. These concerns are listed below:

- Stock price/earnings multiples are substantially variable (and sometimes erratic) in the short term.

- Stock price/earnings multiples are generally affected by macroeconomic events that are not related to the taxpayer.

- Stock price/earnings multiples are quickly and substantially distorted based on short-term, industry-specific, or guideline company-specific events or disclosures.

- Stock price/earnings multiples are always forward-looking, and thus reflect the investment community's expectation of future income that has not been (and may never be) earned.

- Stock price/earnings multiples tend to inflate artificially the value indications of the more successful companies in an industry—particularly if the pricing multiples include consideration of guideline companies that have experienced below-average financial performance.

Exhibit 2 further explains these concerns.

Stock Market Price/Earnings Multiples Are Erratic

Stock market price/earnings multiples can change materially and quickly. The stock prices of publicly traded companies may change 10 percent, 20 percent, or more in a single day. Daily changes in broad stock market indices (such as the Dow Jones Industrial Average) of 100 points, 200 points, or more are also not uncommon.

These price changes clearly reflect the investment community's current perception of stock values. However, these rapid changes do not necessarily reflect investors' perceptions of the taxpayer's asset values.

If the price of a guideline company stock changed (increased or decreased) by 20 percent in one day, no rational investor—or analyst—would expect that the market value of the taxpayer's assets also changed 20 percent. Nonetheless, the direct use of stock price/earnings data in the direct capitalization method can lead to that unreasonable conclusion.

Exhibit 2
Analytical Issues Related to the Direct Use of Stock Price Data
In the Direct Capitalization Method and the Stock and Debt Method

1. Stock prices are influenced by investor expectations of future income from future assets (i.e., assets not yet in existence as of the valuation date).

2. Stock prices change constantly and can materially increase or decrease in the short term. The value of taxpayer assets do not fluctuate in this manner.

3. Stock prices are influenced by macroeconomic factors (e.g., interest rates, inflation rates, tax rates) unrelated to the income-producing capacity of the taxpayer assets.

4. Stock prices are affected by industry factors (e.g., rumored or actual merger and acquisition activity) that do not relate to the operation or the value of the taxpayer assets.

5. Stock prices include investor perceptions of the value of all of the taxpayer company/guideline company assets—both the tangible assets and the intangible assets.

6. Stock prices are influenced by investor perceptions of intangible investment influences (e.g., liquidity preference premiums, investor income tax attributes, portfolio risk diversification, etc.) not related to either the taxpayer's tangible assets or intangible assets.

7. Stock prices are influenced by general changes in the investor market demand for investment-grade securities. This change in the general investor demand for securities does not affect the demand for the taxpayer assets.

8. Stock prices are influenced by investor perceptions of political factors (e.g., wars, elections, etc.). These perceptions do not affect the demand for the taxpayer assets.

9. When the taxpayer company—or the selected guideline companies—operates in multiple industries, stock prices may be disproportionately influenced by investor risk and expected return perceptions of the taxpayer assets not included in the taxable unit.

10. The use of stock prices and stock price/earnings multiples may overstate the value of the more successful taxpayer companies. This is particularly true if the taxpayer industry includes low performance guideline companies.

Stock Market Price/Earnings Multiples Are Influenced by Macroeconomic Events

Stock price/earnings multiples can change substantially even when there is no fundamental change in the guideline company operations or in the general condition of the guideline company or taxpayer industry. Rather, stock price/earnings multiples often change substantially in response to macroeconomic or political conditions that do not have a direct effect on either the taxpayer's business value or the taxpayer's asset value.

For example, announced or perceived changes in Federal Reserve monetary policy, changes in congressionally mandated fiscal policy, changes in White House nominations for Supreme Court justices, or military or political events in the Middle East can all cause substantial changes in stock market prices—and in the resulting stock price/earnings multiples. Similarly, the election or appointments of political candidates in the United States—or as far away as Russia or China—can cause substantial changes in stock market prices and in the resulting stock price/earnings multiples.

As a result of changes in stock prices due to these macroeconomic or political announcements, there is no corresponding change in the market value of the taxpayer's assets. Nonetheless, the direct use of stock price/earnings data in the direct capitalization method can lead to that unreasonable conclusion.

Stock Market Price/Earnings Multiples Are Affected by Short-Term Phenomena

Stock price/earnings multiples can change materially based on short-term phenomena. For example, when a selected guideline company—or the taxpayer company—either attains or fails to attain security analysts' quarterly earnings estimates, the stock price (and corresponding price/earnings multiple) often change materially. This result occurs even though the operating results that triggered the stock price change are short-term and do not reflect any long-term positive or negative trend in that company's performance.

These sudden and short-term stock price changes have a direct effect on the corresponding company's price/earnings multiple. Nonetheless, they do not represent a fundamental change in the value of taxpayer assets.

The market value of taxpayer assets should not be affected when a guideline company experiences short-term operating results above or below security analyst expectations or when it experiences a one-time aber-

rational event. Nonetheless, the direct use of stock price/earnings data in the direct capitalization method can lead to that unreasonable conclusion.

Stock Market Price/Earnings Multiples Are Always Forward-Looking

Security analysis and portfolio management theory, as well as empirical stock market data, indicate that stock prices (and corresponding price/earnings multiples) are forward-looking—or ex ante. That is, stock prices depend on investors' expectations regarding the future results of operations and financial position of the publicly traded companies.

When there is a difference between a guideline company's expected operating results and historical operating results, there are practical problems with the application of the market-derived ex ante price/earnings multiples to the taxpayer's ex post financial data—perhaps more important, guideline company stock prices (and the corresponding price/earnings multiples) are based on what investors think will happen in the future.

Investors will inject their expectations into the guideline company stock prices if the investors believe that the guideline companies will (1) develop new product lines, (2) expand into new markets, (3) make major capital expenditures, and/or (4) consummate mergers and acquisitions.

Of course, these expected results may never actually materialize. Additionally, the guideline company's actual future results of operations may turn out to be considerably below the expected future results of operations.

Therefore, if the ex ante stock prices (and corresponding price/earnings multiples) are used in the unit valuation, the taxpayer will be assessed based on the result of operations that have not yet occurred as of the valuation date—and that may never occur. The taxpayer also will be taxed based on the expected economic benefit of products and markets it has not yet developed, and of capital expenditures and mergers and acquisitions it has not yet made. The direct use of stock price/earnings data in the direct capitalization method can lead to this unreasonable conclusion.

Stock Market Price/Earnings Multiples Exaggerate the Value of Above-Average Taxpayer Units

Typically, when results of operations deteriorate, stock prices do not decrease in the same proportion. For example, when a guideline company has a "bad year" financially, its stock price will decrease.

However, the stock price will usually not decrease by the same percentage as the company's operating results decrease. Therefore, stock price/earnings multiples actually tend to increase when an industry has—or when particular guideline companies have—deteriorating financial results.

For example, let's assume that the guideline company Alpha's 2013 earnings are $10 per share and its 1/1/14 stock price is $100 per share. This corresponds to a 1/1/14 ex post price/earnings multiple of 10X for Alpha. Let's further assume that Alpha's 2014 earnings are $6 per share (or a 40 percent decrease from 2013 earnings) and that the Alpha's 1/1/15 stock price is $75 per share (or a 25% decrease from the 1/1/14 stock price).

These assumptions result in an Alpha price/earnings multiple of 12.5X on 1/1/15, which means that Alpha's price/earnings multiple increased (by 25 percent) when its earnings decreased (40 percent).

One explanation that analysts offer for this well-documented phenomenon is the concept that stock prices are forward-looking. According to analysts, investors expect a future rebound in the taxpayer's industry and guideline company financial performance.

Therefore, when the taxpayer experiences a financially successful year, the direct capitalization method may artificially inflate the unit value. This is because the inflated price/earnings multiples of the less-profitable-than-average guideline companies are applied to the more-profitable-than-average taxpayer earnings. Accordingly, the direct capitalization method may overstate the unit value as a result of overstated capitalization rates extracted directly from the inflated price/earnings multiples of the guideline companies.

The successful taxpayer's unit value should not be influenced by stock prices that are inflated by investors' expectations for the rebound of less successful guideline companies. Nonetheless, the direct use of stock price/earnings data in the direct capitalization method can lead to that unreasonable conclusion.

The Use of Yield Capitalization Rates and the CAPM

A cost of equity capital analysis that directly uses publicly traded stock prices (or price/earnings multiples) is appropriate only in the valuation of equity securities. Stock prices, unlike the values of taxpayer assets, incorporate valuation influences such as investor sentiment, company news, security analyst recommendations, and technical trading influences.

A cost of equity capital analysis that uses relative rates of return (e.g., the CAPM) is typically more appropriate for unit valuations. This is because the CAPM (and related yield capitalization rate methods) rely only indirectly on stock market data. That is, the CAPM relies on long-term relative rates of stock market-based investment returns. It does not rely directly on either current stock market prices or stock price/earnings multiples.

All of the CAPM components are measured in relation to relative rates of return and not to absolute stock prices or price/earnings multiples. For this reason, the use of the CAPM (and related yield capitalization rate methods) mitigates (but does not completely eliminate) the concerns associated with the direct use of stock market data.

Conclusion

The unit value principle is an efficient way to collectively value all taxpayer assets for property tax purposes. The unit value conclusion typically includes all of the taxpayer assets, including all tangible assets and all intangible assets. This discussion summarized the generally accepted unit valuation approaches and methods. This discussion summarized the conceptual development and practical application of unit valuation methods.

This discussion considered the composition of the taxpayer assets subject to unit valuation. In particular, this discussion considered the taxpayer's asset structure in the typical unit valuation.

This discussion summarized the procedures (and application constraints) that analysts generally consider in the cost approach, income approach, and market approach valuation methods. This discussion described the analyst's typical considerations in the unit valuation synthesis and conclusion.

Finally, this discussion considered many of the conceptual concerns and application issues related to the common unit valuation methods. In particular, these concerns focus on the use of stock market-related data (i.e., stock prices and pricing multiples) in the taxpayer unit valuation.

Robert Schweihs and Robert Reilly are managing directors of the firm and are resident in our Chicago practice office. Bob Schweihs can be reached at (773) 399-4320 or at rpschweihs@willamette.com. Robert Reilly can be reached at (773) 399-4318 or at rfreilly@willamette.com.