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Thought Leadership in Unit Valuation Principle Property Tax Appraisals

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Thought Leadership in Unit Valuation Principle Property Tax Appraisals

Editors for This Issue: Connor J. Thurman and John C. Ramirez

Unit Principle Property Valuation Thought Leadership

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Federal Income Tax Thought Leadership

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Forethoughts

This *Insights* issue focuses on thought leadership related to the state and local ad valorem taxation of industrial and commercial property. Specifically, this *Insights* issue considers topics related to taxpayer properties that are appraised based on the unit principle of property valuation.

First, this *Insights* issue discusses the measurement of the valuation adjustment related to the direct use of capital market data in a unit principle property appraisal. The measurement of such a valuation adjustment may be relevant to industrial and commercial property owners subject to unit principle property appraisals.

Second, this *Insights* issue discusses intellectual property valuations for property tax purposes. This discussion focuses on the use of license royalty rate databases in the valuation of taxpayer intellectual property for property tax purposes.

Third, this *Insights* issue considers the application of the property-specific risk premium ("PSRP") in unit principle property appraisals. Specifically, this discussion summarizes the identification and measurement of the PSRP as it relates to the unit principle appraisal of industrial and commercial property. This discussion describes the consideration of (1) qualitative factor analysis, (2) quantitative benchmark or "proxy" analysis, and (3) functional analysis.

Fourth, this *Insights* issue presents a discussion of several common misconceptions regarding the measurement of obsolescence in the application of the cost approach to appraise special purpose industrial and commercial property.

Finally, this *Insights* issue discusses an F reorganization in the context of an S corporation acquisition. Notably, this discussion summarizes the income tax benefits (and the income tax costs) of an F reorganization structure as part of the sale and purchase of an S corporation.

About the Editors

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Connor Thurman is a manager of Willamette Management Associates, a Citizens company. He resides in our Portland, Oregon, office.

Connor has over four years of experience developing valuations of fractional ownership interests in businesses, valuations of intangible property and intellectual property, lost profits/economic damages measurement analyses, and appraisal reviews. Connor prepares these valuations and damages analyses for taxation planning and compliance (federal income, state and local property tax, transfer tax) purposes and for forensic analysis and dispute resolution purposes.

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Valuation Adjustments Related to the Use of Capital Market Data in Developing Unit Principle Property Appraisals

John C. Ramirez, Robert F. Reilly, CPA, and Charlene M. Blalock

Taxpayers, tax counsel, tax assessment authorities, and valuation analysts ("analysts") sometimes use market-derived pricing data from publicly traded stocks and bonds ("capital market data") when developing unit principle valuations for property tax purposes. Sometimes analysts directly use these capital market data in the application of the income approach, market approach, and cost approach in unit principle property appraisals. Analysts may use these securities data to develop yield capitalization rates, direct capitalization rates, pricing multiples, and required rates of return (to measure either entrepreneurial incentive or economic obsolescence). However, securities often have risk and expected return investment characteristics different than the taxpayer's property that is the subject of the unit principle appraisal. In particular, securities are different than taxpayer property with regard to the investment attributes of (1) operational control and (2) marketability. Therefore, analysts often consider control price premium data and discount for lack of marketability studies to estimate a valuation adjustment to apply in a unit principle property appraisal that relies on capital market data. This valuation adjustment may be applied to account for differences in the risk and expected return investment attributes of publicly traded securities compared to taxpayer industrial and commercial property. Like all valuation adjustments, such an adjustment is intended to make the "comparables" (i.e., the publicly traded securities) more like (i.e., have the same investment characteristics as) the "subject" (i.e., the taxpayer's taxable property). This discussion summarizes the development of such a valuation adjustment when capital market data are directly used to develop a unit principle appraisal of taxpayer property for property tax purposes.

Introduction

Taxpayers, tax counsel, taxing assessment authorities, and valuation analysts ("analysts") may directly apply market-derived pricing data from publicly traded stocks and bonds ("capital market data") when developing unit principle property appraisals for property tax purposes. The unit principle (sometimes called the utility principle) of property appraisal encompasses the following generally accepted property appraisal approaches: the income approach, the market approach, and the cost approach.

The direct use of securities pricing and other capital market data can affect each of the unit principle property appraisal approaches. For example, the use of capital market data can affect (1) the

income approach direct capitalization method, (2) the market approach stock and debt method, and (3) the cost approach historical cost (or original cost) less depreciation method. In the application of the cost approach, for example, the use of capital market data can affect the measurement of either entrepreneurial incentive or economic obsolescence.

It is important for analysts to understand that securities have fundamentally different risk and expected return investment characteristics than the taxpayer's industrial or commercial property subject to taxation. In particular, publicly traded securities and taxpayer property typically have different risk and expected return investment attributes with regard to:

1. operational control and
2. marketability.

Analysts are sometimes called on by property owners to analyze the operational control and marketability differences between (1) industrial or commercial property and (2) negotiable securities. These analyses are intended to quantify any "valuation adjustment" that may be applicable to the value conclusions of a unit principle property appraisal developed with the direct use of capital market data.

When developing such a valuation adjustment, analysts often consider control price premium ("CPP") data and discount for lack of marketability ("DLOM") data. Analysts consider such empirical data sources in order to estimate the valuation adjustment applicable to the unit principle property appraisal that relies on capital market data.

Such a valuation adjustment may be applicable to certain unit principle appraisal methods. Like all valuation adjustments, such a valuation adjustment is intended to make the "comparable properties" (i.e., the publicly traded securities) more comparable to the "subject property" (i.e., the taxpayer's industrial or commercial property).

Unit Principle Property Appraisal Methods

The unit principle of property appraisal is applied to value all of a taxpayer's property collectively as a single unit (the "total unit") of property. Depending on the unit principle property appraisal method applied, the appraisal typically concludes the value of all of the taxpayer's working capital accounts, real estate, tangible personal property, and intangible personal property.

When developing unit principle property appraisals, analysts should consider whether or not the total property unit is subject to taxation in each taxing jurisdiction. For example, working capital or intangible personal property may not be subject to property taxation in certain taxing jurisdictions. In such an instance, the value of the property that is not subject to taxation should be removed from the total unit value in order to conclude the value of the taxpayer's taxable property.

The unit principle of property appraisal was originally developed to value the total property of public utility and other regulated taxpayers. Historically, such "utility-type" taxpayers included electric generation and distribution companies, telecom companies, interstate pipelines, airlines, railroads, and others.

Today, the unit principle of property appraisal is often applied to value any taxpayer property that (1) moves (e.g., airlines and railroads), (2) crosses taxing jurisdictions (e.g., pipelines and electric distribution companies), or (3) is physically, functionally, and economically integrated (e.g., gas distribution companies, water and wastewater companies, electric generation plants, oil refineries, mines, marinas, hospitals, and many others).

There are generally accepted unit principle property appraisal approaches and methods. Some of the generally accepted unit principle property appraisal methods include the following:

1. The income approach direct capitalization method
2. The income approach yield capitalization method
3. The market approach stock and debt method
4. The market approach direct sales comparison method
5. The cost approach historical cost (or original cost) less depreciation method

Market-derived pricing data from securities is sometimes applied in each of these unit principle property appraisal approaches and methods. In particular, market-derived capital market data may be applied in the analyst's development of:

1. the income approach direct capitalization method and
2. the market approach stock and debt method.

The Direct Capitalization Method

The direct capitalization method is a generally accepted unit principle income approach appraisal method. Depending on how it is applied, the direct capitalization method may also be a generally accepted summation principle income approach appraisal method.

Analysts often apply several different pricing multiples in the application of the stock and debt property appraisal method. And, analysts often consider several different time horizons (e.g., latest 12-month period, five-year average period) in the application of the stock and debt property appraisal method.

In the unit principle direct capitalization method, a defined measure of income is divided by a market-derived direct capitalization rate in order to estimate the total unit value. Analysts sometimes derive the direct capitalization rate from the prices of publicly traded stocks and bonds (i.e., securities).

In order for this property appraisal method to develop meaningful value indications, the securities should be sufficiently comparable to the taxpayer property (i.e., the taxpayer's industrial and commercial property) from a risk and expected return investment attribute perspective.

Alternatively, in the direct capitalization method, the direct capitalization rate can be developed indirectly (i.e., not directly from securities pricing data). The taxpayer's weighted average cost of capital (including the capital components of debt, preferred equity, and common equity) is typically analyzed to conclude a yield capitalization rate. Then, the direct capitalization rate may be calculated as: the yield capitalization rate minus the expected long-term growth rate in the measure of income subject to capitalization.

The Stock and Debt Method

The stock and debt property appraisal method is sometimes referred to as the guideline publicly traded company ("GPTC") method in the business valuation literature. The stock and debt method is a generally accepted unit principle property appraisal method. In contrast, the GPTC method is a generally accepted market approach business valuation method. These two valuation methods have numerous procedural differences. However, for simplicity purposes only, we refer to these two different valuation methods interchangeably for purposes of this discussion.

In the unit valuation principle stock and debt method, the total unit may be valued through the use of valuation pricing multiples derived from selected GPTCs.

In the stock and debt property appraisal method, the sum of the taxpayer's long-term debt, preferred stock, and common stock (i.e., the securities) results in the value indication for the total unit of taxpayer property.

In the stock and debt property appraisal method, analysts first select GPTCs that provide meaningful pricing guidance with regard to the subject taxpayer company. Second, analysts typically develop valuation pricing multiples by dividing the GPTC value indications by the GPTC financial fundamentals.

Some of the typical GPTC financial fundamental metrics include the following:

1. Net sales
2. Earnings before interest and taxes ("EBIT")
3. Earnings before interest, taxes, depreciation, and amortization ("EBITDA")

In order to estimate the value of the total unit of taxpayer industrial and commercial property, the analyst applies the valuation pricing multiples (derived from the GPTCs) to the taxpayer's respective financial fundamentals.

Investment Attributes of Publicly Traded Securities versus Taxpayer Property

The direct capitalization method and the stock and debt method sometimes rely directly on capital market data (i.e., securities pricing data) in order to estimate the value of the total unit of the taxpayer's industrial or commercial property.

However, analysts should understand that there are significant differences in the risk and expected return investment attributes of (1) the taxpayer's taxable property and (2) the securities used in these unit valuation methods. With regard to the analyst's consideration of and measurement of any appropriate valuation adjustment, securities are not comparable to taxpayer property—at least in terms of investment risk and expected return attributes.

For purposes of this discussion, we consider the term "comparable" to mean that the subject taxpayer and the GPTCs relied on in the unit principle appraisal:

1. operate in a similar industry (or the GPTC data can be adjusted for industry differences),
2. have similarly sized business operations,
3. have business operations of the same general current and expected future income-generating capacity (or the GPTC data can be adjusted for income differences), and
4. have similar profit margins, rates of investment return, growth rates, and other financial fundamentals (or the GPTC data can be adjusted for any differences).

In this discussion, we compare the risk and expected return investment attributes of operating property and publicly traded securities in the same general industry—and in the same (or sufficiently comparative) companies.

If the risk and expected return characteristics of the publicly traded securities are different from the taxpayer's property, then—without the analyst applying an appropriate valuation adjustment—the unit principle appraisal may not conclude a credible value indication for the taxpayer's industrial or commercial property.

The level of risk related to investing in taxpayer operating property is often greater than the level of risk related to investing in publicly traded securities. The direct relationship between risk and expected return on investment is well established both in the financial literature and in the investment community.

Accordingly, any additional risk related to investing in a taxpayer's industrial or commercial property would cause investors to require a greater rate of return compared to investing in similar industry publicly traded securities.

This greater rate of return required by investors will result in (1) lower valuation pricing multiples (e.g., price-to-earnings valuation pricing multiples) and (2) higher direct capitalization rates.

That is, the price-to-earnings valuation multiples applicable to negotiable securities would have to be downward adjusted (i.e., decreased) in order to make these pricing multiples applicable to the valuation of taxpayer industrial or commercial property. And, downward-adjusted (i.e., decreased) pricing multiples imply upward-adjusted (i.e., increased) direct capitalization rates.

Differences between Taxpayer Property and Publicly Traded Securities

The risk and expected return investment attribute differences between taxpayer industrial or commercial property and publicly traded securities are principally related to the following two investment concepts:

1. Operational control
2. Marketability

Operational control refers to the rights and privileges associated with having control over (1) an operating property (whether tangible or intangible) or (2) a financial asset (such as working capital accounts).

Marketability refers to the ability to sell a property quickly, at a low transaction cost, and at a predictable price.

The following sections in this discussion:

1. analyze the two investment concepts of operational control and marketability,
2. review data and empirical studies related to each of these two investment concepts, and
3. consider a reasonable range for a valuation adjustment based on these two investment concepts.

Operational Control Attributes

The controlling owners of many types of businesses typically can perform the following types of ownership/operational control activities:

- Set operational and/or strategic policy and change the direction of the business
- Decide which product or service lines to offer and which product or service lines not to offer
- Decide which properties to buy and operate—and which properties to sell and not operate
- Decide which product/service markets and geographical territories to discontinue—and which product/service markets to expand into
- Determine management compensation and other employment arrangements
- Negotiate and consummate mergers and acquisitions and other capital market transactions
- Decide to liquidate, dissolve, recapitalize, or sell the company
- Determine the entity's capital structure and decide to finance, refinance, or recapitalize the entity
- Enter into contracts on behalf of the entity—and enter into contracts with the entity
- Decide the dividend policy—or other forms of profit or property distributions to the entity owners

By contrast, noncontrolling owners cannot unilaterally make these ownership/operational control decisions. Because of this ability to control business operations and to implement business decisions, controlling business owners have less investment risk than do noncontrolling (minority) investors.

Because of this reduced investment risk, the value of a noncontrolling investment in a business entity is less than the pro rata portion of the total business enterprise value.

The value increment of the controlling ownership position compared to the noncontrolling ownership position is typically called the "control price premium." The control price premium represents the extra value associated with having ownership and operational control of an income-producing business enterprise.

Control price premiums may differ depending on the operating environment in different industries. For example, controlling owners in heavily regulated (or even partially regulated) industries—such as public utilities, interstate and intrastate pipelines, or railroads—may need to obtain regulatory approval in order to implement certain strategic management decisions—such as a merger, acquisition, liquidation, or divestiture.

Ownership/operational control may not result in as much of a value increment in regulated industries as it is in nonregulated industries. This is because, regardless of percentage ownership, no single individual (or group of individuals) enjoys "absolute control" over the regulated business enterprise.

Even though the business owner may not have absolute control of the business property in a regulated industry (such as a public utility or a railroad), the business owner does have more control over the business property operations compared to the securities investor.

The securities investor has (at most) indirect control over the business property operations. When securities trade on stock exchanges, they trade in noncontrolling ownership interest blocks. Therefore, valuation pricing multiples and securities

prices derived from stock market data relate to noncontrolling ownership interests.

That conclusion means that securities prices and securities pricing multiples already incorporate an implicit discount for lack of ownership/operational control ("DLOC"). Stock exchange-derived security prices do not reflect a control price premium ("CPP"). Rather, stock exchange securities prices reflect an implicit DLOC.

Marketability Differences

Marketability refers to the ability to sell a property quickly, with a reasonable and predictable selling cost, and at a reasonably priced stable sale price. The difference in price that an investor will pay for a liquid security compared to an otherwise comparable illiquid property may be substantial. This difference in price is typically referred to as the DLOM.

Because of these marketability differences, a transaction involving taxpayer operating property encompasses much greater investment risk than a transaction involving negotiable securities.

That is, it takes more time to sell taxpayer operating property than it takes to sell publicly traded securities. It costs more in selling expenses to sell taxpayer operating property than the brokerage fees associated to stock exchange sale commissions. And, the ultimate sale price of taxpayer property is more variable and uncertain than the known stock market trading price of publicly traded securities.

This increase in investment risk related to the illiquid taxpayer property (compared to the liquid securities)is often quantified through the estimation of the DLOM.

Most negotiable securities are extremely marketable. They trade quickly and easily on stock exchanges such as the New York Stock Exchange. Security transactions occur on the day of the market order, and the sale proceeds from these transactions are received almost immediately.

Taxpayer operating properties, on the other hand, are less marketable. Taxpayer property sale transactions are often time consuming and expensive. Taxpayer property owners have no organized or efficient market in which to sell their industrial or commercial property.

Taxpayer property owners are often not sure how to price the property for sale. That is, the price is certainly not based on the last stock exchange trading price. And, taxpayer property owners typically do not know when the property sale transaction will occur or when the sale proceeds will be received.

The marketability differences between taxpayer property and publicly traded securities generally can be separated into two components:

1. The longer market exposure time involved in selling the illiquid taxpayer property (compared to the liquid securities)
2. The higher transaction costs involved in selling the illiquid taxpayer property (compared to the liquid securities)

Taxpayer Property Investment Holding Period

Taxpayer property is subject to a longer market exposure (selling) period than the almost-immediate selling period for negotiable securities. In addition, taxpayer property has greater risk than negotiable securities with regard to their respective anticipated holding periods.

Securities investors are able to turn over their investments hourly, daily, or weekly. That is, investors in negotiable securities can own their investments for a relatively short time horizon—if they so choose.

However, taxpayer operating property may turn over once every few decades, if at all. In other words, the investment holding period for taxpayer operating property is much greater than the investment holding period for publicly traded securities.

The increased investment holding period increases the risk associated with taxpayer operating property. As market conditions change, securities investors can liquidate their portfolios almost immediately.

Taxpayer property owners cannot easily liquidate their portfolio of operating property. The longer the expected investment time horizon, the greater the risk to the investor. This risk is due to market price volatility risk, missed alternative investment opportunities, inflation risk, and other factors.

Taxpayer Property Transaction Costs

The typical transaction costs related to securities investors are low and predictable. This statement is true whether the investor is selling securities or buying securities. In contrast, the typical transaction costs related to taxpayer property owners are often large and unpredictable.

These potentially greater transaction costs (as a percent of the total dollar amount of the sale transaction) represent an increased investment risk to taxpayer property owners—when compared to securities investors.

To compensate for the greater investment risk associated with these two factors, taxpayer property owners require a greater rate of return on their investment than do securities investors on their investments.

Control Price Premiums and Discounts for Lack of Marketability

In order to consider the marketability and operational control differences between taxpayer property and publicly traded securities, analysts may estimate:

1. the control price premium associated with taxpayer operating property compared to publicly traded securities and
2. the discount for lack of marketability associated with taxpayer operating property compared to publicly traded securities.

Analysts are often called on to measure the appropriate valuation adjustment based on CPP data and DLOM data. Taxpayers, tax counsel, and tax assessment authorities can use these analyses to measure the valuation adjustment that may be applicable to the unit principle appraisal of industrial or commercial property.

Valuation adjustments (i.e., with valuation discounts and valuation premiums) are a generally accepted valuation procedure in both the property appraisal discipline and the business valuation discipline. For example, valuation adjustments have been recognized by the federal courts for decades in valuation-related judicial decisions with respect to federal income tax, gift tax, and estate tax issues.

In addition, valuation adjustments are recognized in the professional standards of various valuation professional organizations ("VPOs"). Such VPO professional standards include the following:

1. The American Institute of Certified Public Accountants *Statement on Standards for Valuation Services*
2. The American Society of Appraisers *Business Valuation Standards*
3. The Appraisal Institute *Standards of Professional Practice*
4. The International Valuation Standards Counsel *International Valuation Standards*
5. The *Uniform Standards of Professional Appraisal Practice* promulgated by the Appraisal Foundation

Estimating the CPP

Since operational control is a more desirable investment characteristic than lack of operational control, taxpayer property may be valued at a price premium compared to securities. Such a CPP may affect valuation pricing multiples, direct capitalization rates, and so forth.

One data source for estimating the CPP is *Mergerstat Review* published by FactSet Mergerstat, LLC. *Mergerstat Review* presents a CPP study that includes comprehensive research on publicly announced mergers, acquisitions, divestitures, and the premiums paid for controlling interests in public companies.

Mergerstat Review data are often analyzed to estimate the CPP. This is because these data include price premiums paid for many different industries over the past 45 years.

The following discussion summarizes how some analysts apply *Mergerstat Review* data to estimate a CPP. This CPP is considered as part of the valuation adjustment applicable to the unit principle property appraisal.

Mergerstat Review Analysis

To estimate a CPP, the analyst may examine price premium data related to control transactions in industries similar to the subject taxpayer industry. For example, if the analyst was developing a valuation adjustment for a capital-intensive company in a regulated industry, the analyst may examine control transactions in capital-intensive, regulated industries.

The analyst may compare CPP data over both a short-term and a long-term time period. The purpose of this procedure is to identify whether there have been any significant changes over time in the amount of CPPs paid to the measurement of the appropriate valuation adjustment. Usually, CPP data closer in time to the subject valuation date are more meaningful.

However, there could be changes in the financial and economic environment over time that result in higher or lower levels of the CPP paid. Therefore, analysts often consider the level of the CPP paid over a time period of 5 or 10 years.

Analysts should note that *Mergerstat Review* calculates the reported acquisition price premium data based on the acquired company stock price on

the transaction announcement date, and not on the transaction close date.

There is often a difference of several months between the announcement date and close date for the acquisition transactions analyzed in the *Mergerstat Review* data. During that time period, some market appreciation of the target company stock— unrelated to the pending acquisition transaction—may have occurred.

The analyst can estimate this market influence for each transaction where an announcement date and a close date are available. The analyst can measure this market influence by adjusting the effects of market appreciation or depreciation from the stated CPP.[1]

For all industries included in *Mergerstat Review*, the total average reported acquisition price premium from 2001 to 2020 was 42.8 percent, and the reported acquisition price premium for the past five years was 42.9 percent.

Analysts should note that the CPP will likely differ depending on the industry. For example, in 2020, the average acquisition price premium for the brokerage, investment management and consulting industry was 40.4 percent. However, the average acquisition price premium for the drugs, medical supplies, and equipment industry was 74.3 percent.[2]

The analyst can identify those industries that are most similar to the taxpayer's industry in order to extract the most relevant data to apply in the valuation adjustment analysis.

Controlling Ownership Interest versus Noncontrolling Ownership Interest Price Premiums

Mergerstat Review includes acquisition price premium data from transactions where as little as 10 percent of the target company's stock is purchased. Therefore, acquisition price premiums calculated from the *Mergerstat Review* transactional data typically include noncontrolling ownership interest transactions as well as controlling ownership interest transactions.

Mergerstat Review presents the averages of the price premiums paid for the acquisition of both noncontrolling ownership interests (defined here as a 10 percent equity interest up to a 50 percent equity interest) and controlling ownership interests (defined here as greater than a 50 percent equity interest).

According to the *Mergerstat Review* transactional data, for the years from 2016 through 2020, the average acquisition price premium paid for a noncontrolling ownership interest was 29.7 percent (rounded).

Buyers of noncontrolling ownership interests typically expect to receive some—but not all—of the economic benefits associated with operational control. Such economic benefits may be in the form of contractual agreements, continued business relationships, or other synergistic benefits associated with these strategic alliances.

The noncontrolling investments may also be significant enough to allow the purchaser to obtain one or more seats on the target company's board of directors. However, in these instances of a noncontrolling ownership interest acquisition, the buyer does not enjoy the economic benefits of *absolute* ownership control.

In contrast, purchasers of a controlling ownership interest expect to gain synergistic benefits as a result of the acquisition *and* the economic benefits of absolute ownership control of the target company's operating property.

The ownership control element of an acquisition price premium is often estimated as:

1. the additional price premium paid for a controlling ownership interest in excess of
2. the price premium paid for a noncontrolling ownership interest.

The difference between these two types of acquisition transactions is that the controlling ownership interest buyer also gets the economic perquisites of absolute control.

Let's consider an illustrative example (using the *Mergerstat Review* data) to estimate the incremental value associated with absolute ownership control. If the per share market value of common stock for a company was $100 and a buyer is willing to pay a price premium of 30 percent for a noncontrolling ownership interest, then the purchase price per share would be $130 for the noncontrolling ownership interest.

If a buyer is willing to pay a price premium of 43 percent for an absolute controlling ownership interest, then the purchase price would be $143 per share for an absolute controlling ownership interest.

In this example, the incremental price premium paid for absolute ownership control (and not for the synergistic benefits that already accrue to the buyer of a noncontrolling ownership interest) is: ($143 – $130) / $130—or 10 percent.

This 10 percent price premium indicates the incremental price that a buyer would pay to obtain absolute ownership control over a target company.

This increment price is in excess of the price that the buyer would pay to receive only the level of control associated with a noncontrolling ownership position.

Other Transaction Databases

In addition to analyzing transaction data reported in *Mergerstat Review*, the analyst can also analyze data reported by S&P Capital IQ, FactSet, or Refinitiv Workspace, to name a few. These databases maintain extensive information on historical U.S. merger and acquisition transactions.

When estimating the CPP, it may be important to include acquisition transactions from the database that involve financial buyers only (i.e., nonstrategic acquirers and nonleveraged buyout transactions). Such data would eliminate the impact of strategic buyers and leveraged buyout transactions from the CPP analysis.[3]

This is because strategic acquirers may pay an acquisition price premium for expected buyer-specific, post-merger synergies in addition to a price premium paid solely for control of operating property.

In this discussion, we are interested in isolating the price premium associated with the control of taxpayer property.

Similar to the application of the *Mergerstat Review* data, the analyst may include transaction data for both a shorter time period such as 5 years, and a longer time period such as 10 years—for the reasons discussed above.

There is often a difference of several months between the announcement date and the effective date for the transactions in this database. The analyst may want to make the same adjustment for the target company market appreciation between (1) the announcement date and (2) the effective date.

CPP Conclusion

A valuation adjustment analysis may consider data from multiple data sources, such as *Mergerstat Review*, S&P Capital IQ, and FactSet.

After analyzing the CPP data in relevant industries from these securities, the analyst may calculate price premium measures of central tendency over relevant time periods (i.e., 5 years, 10 years, etc.).

The analyst should be aware that the data related to the acquisition of controlling ownership interests (versus noncontrolling ownership interests) indicate that a large portion of acquisition price premiums relate to expected post-transaction synergistic benefits—and not only to the ownership control of operating property.

Analysis of the DLOM

In addition to estimating a CPP, the analyst may also consider the DLOM component of the valuation adjustment. The DLOM component takes into consideration the time, the difficulty, the expense, and the uncertainty of selling taxpayer property compared with selling liquid securities.

This DLOM component may be an important consideration in measuring a valuation adjustment to apply to securities-derived capitalization rates and valuation pricing multiples in the development of the unit principle property appraisal.

Analysts typically rely on empirical studies to quantify the appropriate DLOM. Generally, such empirical studies incorporate data that are based on capital market transaction observations—rather than on theoretical economic principles.

There are two categories of empirical studies that analysts often consider to quantify the DLOM for noncontrolling ownership interests in private companies:

1. Studies of price discounts on private stock sale transactions prior to an initial public offering ("IPO"); these studies are often referred to as "pre-IPO studies"
2. Studies of price discounts on the sale of restricted shares of publicly traded companies; these studies are often referred to as "restricted stock studies"

Analysts often incorporate empirical studies that address the pricing impact associated with the lack of marketability of non-publicly-traded securities. The consensus of such studies indicates that non-publicly-traded (nonmarketable) securities suffer from a lack of marketability compared to publicly traded (marketable) securities.

The quantitative effect of this investment illiquidity characteristic is that the prices of nonmarketable securities are discounted by approximately 30 percent to 50 percent when compared to the prices of comparative publicly traded securities.

From data analyzed in published studies, the analyst can create data subsets that include companies that operate in the same industry as the taxpayer. Similar to the CPP studies, the analyst may examine data from industries that are similar to the industry in which the taxpayer property operates.

Pre-IPO Studies

A pre-IPO study examines arm's-length sale transactions in the stock of a private company that has subsequently achieved a successful IPO of its stock.

In a pre-IPO study, the DLOM is quantified by analyzing (with various adjustments) the difference between:

1. the public market price at which a stock was issued at the time of the IPO and
2. the private market price at which a stock was sold (in an arm's-length transaction) prior to the IPO.

Analysts often consider various published pre-IPO studies. Three pre-IPO studies are summarized below.

Emory Studies

A number of studies were conducted under the direction of John D. Emory Jr., currently president, and John D. Emory Sr., currently senior advisor, of Emory & Co. in Milwaukee, Wisconsin.[4] The Emory studies covered various time periods from 1980 through 2000.[5]

The Emory studies excluded:

1. development stage companies;
2. companies with a history of real operating losses;
3. companies with an IPO price less than $5 per share;
4. foreign companies; and
5. banks, saving and loans, real estate investment trusts, and utilities.

Except for the 1997 through 2002 study, Emory used the same methodology for each of the studies. The 1997 through 2002 study focused on sale transactions of common and convertible preferred stock, and did not exclude companies on the basis of financial strength.

The observations in each study consisted of companies with an IPO in which Emory's firm either participated or received a prospectus. A prospectus for the 4,088 offerings was analyzed to determine the relationship between:

1. the IPO price and
2. the price of the latest private stock sale transaction (up to five months prior to the IPO).

As indicated in Exhibit 1, the mean and median price discounts from all of the transactions analyzed in the Emory pre-IPO studies is 44 percent and 43 percent, respectively.[6]

Exhibit 1
Emory Pre-IPO Studies
Indicated DLOM Results

Pre-IPO Study Analysis Period	Number of Prospectuses Reviewed	Number of Qualifying Transactions	Indicated Price Discount	
			Mean	Median
1980–1981	97	12	59%	68%
1985–1986	130	19	43%	43%
1987–1989	98	21	38%	43%
1989–1990	157	17	46%	40%
1990–1991	266	30	34%	33%
1992–1993	443	49	45%	43%
1994–1995	318	45	45%	47%
1995–1997	732	84	43%	41%
1997–2000 [a]	1,847	266	50%	52%

[a] This is an expanded study. The expanded study focused on sale transactions of common and convertible preferred stock, and did not exclude companies on the basis of their financial strength. Note: The results above are from "Underlying Data in Excel Spreadsheet for 1980–2000 Pre-IPO Discount Studies, as Adjusted October 10, 2002," located at www.emoryco.com/valuation-studies.shtml.

Valuation Advisors Studies

Valuation Advisors, LLC ("VA"), maintains a database that includes over 17,000 pre-IPO transactions that occurred within two years of an IPO.[7]

These pre-IPO transactions are arranged into five time periods: four 3-month intervals for the 12 months immediately before the IPO, and a single period for the time frame from one to two years before the IPO. The pre-IPO transactions are also arranged by type of security (i.e., stock, convertible preferred stock, or option).

VA performed a pre-IPO study for each year between 1995 and 2020. Exhibit 2 summarizes the implied DLOM results of the VA studies.

Willamette Management Associates Studies

Willamette Management Associates ("WMA") prepared 18 pre-IPO studies covering the period of 1975 through 1997 and an additional study covering the five years 1998 through 2002.

As in the previous pre-IPO studies, the 1998–2002 study included only private market stock sale transactions that were considered to be on an arm's-length basis.

The transactional data analyzed in these pre-IPO studies included (1) sales of private stock in private placements and (2) repurchases of treasury stock by the private company.

All transactions involving the granting of employee, executive, or other compensation-related stock options were eliminated from consideration in the pre-IPO studies. In addition, all transactions involving stock sales to corporate insiders or other related parties were eliminated from consideration.[8]

Exhibit 2
Valuation Advisors Pre-IPO Studies
Indicated DLOM Results

	Period before IPO in Which Transaction Occurred					
IPO Year	0–3 Months	4–6 Months	7–9 Months	10–12 Months	1–2 Years	Number of Transactions
1995	37.82%	28.62%	60.40%	50.33%	60.64%	34
1996	30.83%	52.97%	56.37%	69.38%	71.81%	270
1997	34.18%	50.00%	67.12%	76.01%	80.00%	212
1998	23.35%	46.67%	68.93%	71.41%	71.91%	212
1999	30.77%	53.89%	75.00%	76.92%	82.00%	694
2000	28.70%	45.08%	61.51%	68.92%	76.64%	653
2001	14.74%	33.17%	33.38%	52.06%	51.61%	115
2002	6.15%	17.33%	21.88%	39.51%	55.00%	81
2003	28.77%	22.30%	38.36%	39.71%	61.37%	123
2004	16.67%	22.68%	40.00%	56.25%	57.86%	334
2005	14.75%	26.10%	41.68%	46.11%	45.45%	296
2006	23.47%	20.69%	40.23%	46.51%	56.27%	264
2007	12.67%	32.55%	43.69%	56.00%	54.17%	459
2008	20.00%	24.21%	45.85%	52.17%	41.18%	41
2009	6.16%	31.85%	26.82%	41.00%	34.87%	108
2010	15.81%	29.89%	44.42%	47.54%	51.88%	358
2011	23.60%	32.70%	43.30%	51.40%	62.60%	302
2012	19.60%	24.00%	28.90%	39.60%	47.40%	322
2013	18.80%	25.40%	47.40%	49.80%	56.70%	541
2014	12.90%	27.90%	37.10%	47.60%	59.20%	756
2015	22.40%	27.40%	41.10%	46.70%	52.10%	444
2016	6.50%	18.20%	29.20%	33.20%	41.10%	268
2017	22.30%	28.60%	52.40%	46.70%	50.00%	381
2018	24.50%	41.50%	51.40%	62.60%	61.60%	564
2019	21.20%	31.90%	46.40%	52.00%	62.00%	430
2020	35.50%	46.10%	55.10%	55.00%	60.80%	651
1995–2020 Average	21.24%	32.37%	46.07%	52.86%	57.93%	
2008–2020 Average	19.17%	29.97%	42.26%	48.10%	52.42%	

Source: Brian K. Pearson. "Valuation Advisors' Lack of Marketability Discount Study™," Business Valuation Resources Teleconference, August 23, 2007 (1995–2006); Valuation Advisors database (2007–2020).

Due to the small sample size of identified transactions in 2001 and 2002, the data from those years was excluded from the analysis.

The indicated DLOM results of the WMA pre-IPO studies are presented in Exhibit 3.

Restricted Stock Studies

The second type of empirical study that analysts frequently consider when developing a discount DLOM is restricted stock studies. Restricted stock studies examine the market prices of restricted public stock transactions dating back to the late 1960s.

These restricted stock studies, which consider hundreds of transactions, indicate an average discount for the restricted stock of a public company as compared to its freely tradable (registered) counterpart stock of:

1. approximately 35 percent for transactions occurring in the 1968 to 1988 period and
2. approximately 20 percent to 25 percent for transactions occurring after 1990.

Registered stock includes the shares of public companies that can be freely traded in the open market. Unregistered shares of stock are not registered for trading on a stock exchange. Unregistered shares cannot be freely traded in the open market.

The observed price discounts (i.e., public stock price compared to same company private stock

Exhibit 3
Willamette Management Associates Pre-IPO Studies Indicated DLOM Results

Time Period Analyzed	Number of Companies Analyzed	Number of Transactions Analyzed	Standard Mean Price Discount	Trimmed Mean Price Discount [a]	Median Price Discount
1975–78	17	31	34.0%	43.4%	52.5%
1979	9	17	55.6%	56.8%	62.7%
1980–82	58	113	48.0%	51.9%	56.5%
1983	85	214	50.1%	55.2%	60.7%
1984	20	33	43.2%	52.9%	73.1%
1985	18	25	41.3%	47.3%	42.6%
1986	47	74	38.5%	44.7%	47.4%
1987	25	40	36.9%	44.9%	43.8%
1988	13	19	41.5%	42.5%	51.8%
1989	9	19	47.3%	46.9%	50.3%
1990	17	23	30.5%	33.0%	48.5%
1991	27	34	24.2%	28.9%	31.8%
1992	36	75	41.9%	47.0%	51.7%
1993	51	110	46.9%	49.9%	53.3%
1994	31	48	31.9%	38.4%	42.0%
1995	42	66	32.2%	47.4%	58.7%
1996	17	22	31.5%	34.5%	44.3%
1997	34	44	28.4%	30.5%	35.2%
1998	14	21	35.0%	39.8%	49.4%
1999	22	28	26.4%	27.1%	27.7%
2000	13	15	18.0%	22.9%	31.9%

[a] Excludes the highest and lowest deciles of indicated discounts.
Source: Pamela Garland and Ashley Reilly, "Update on the Willamette Management Associates Pre-IPO Discount for Lack of Marketability Study for the Period 1998 Through 2002," *Insights* (Spring 2004).

price) indicate the DLOM. These stock price discount data are the basis for the restricted stock studies.

Restricted stock studies are frequently considered by analysts with regard to measuring the DLOM for private company stock. However, restricted stock studies are less relevant to analysts when measuring the DLOM component of a valuation adjustment to the unit principle property valuation.

Restricted shares of public corporation stock may not be traded directly on a stock exchange. However, the investor has certainty that, in a relatively short time period, the trading restrictions will lapse. While restricted shares may be restricted, they are public company stock—only with a temporary trading restriction.

Unlike the restricted stock owners, the taxpayer property owner permanently lacks access to a liquid market. The illiquidity of taxpayer operating property will not resolve in 6 months or 12 months. The illiquidity of taxpayer operating property is a permanent attribute of that property.

Accordingly, while an interesting data source, the above-described restricted stock studies materially understate the DLOM applicable to the appraisal of taxpayer property.

Therefore, analyst's generally give these studies little weight in the measurement of the valuation adjustment applicable to the unit principle property appraisal.

DLOM Conclusion

The mean and median DLOM indicated by the Emory studies were 46 percent and 43 percent, respectively.

The average DLOM indicated by the VA studies for the one to two years prior to the IPO transaction was 58.8 percent for the 1995 to 2012 period and 46.9 percent for the 2008 to 2012 period.

The mean and median DLOM indicated by the WMA studies for the years from 1975 through 2000 were 37.3 percent and 49.4 percent, respectively.

Analysts often consider these data sources in the measurement of the DLOM component of the valuation adjustment to the unit principle property appraisal.

The Valuation Adjustment

An analyst can use the CPP data and the DLOM data discussed above in the measurement of a valuation adjustment to apply to the unit principle property appraisal. This valuation adjustment may be applied to the unit principle appraisal methods that were developed through direct reliance on stock market prices and valuation pricing multiples.

The effect of the CPP measurement and the DLOM valuation adjustment is multiplicative, and not additive. A simple example is presented in Exhibit 4 to illustrate this mathematical principle.

Let's assume the analyst estimates a CPP adjustment of 25 percent and a DLOM adjustment of 50

percent as the two components of the unit valuation principle valuation adjustment. Let's further assume that the unadjusted unit principle appraisal concluded a value for the Taxpayer Company stock component of the total unit of $160 per share.

This example assumes that this unit value is derived exclusively from unit appraisal methods that rely directly on securities prices or securities pricing multiples. And, this example assumes that the valuation adjustment—as calculated—would apply to the Taxpayer stock component of the total unit value—and not to the total Taxpayer Company property value conclusion.

Exhibit 4
Taxpayer Company ("Taxpayer")
Illustrative Unit Principle Appraisal Value Indication
Unit Value Expressed on a Per-Share of Stock Basis
Application of Valuation Adjustment Illustrative Example

1. Per-Share Value of Taxpayer Stock, on a Noncontrolling, Marketable Ownership Interest Basis	$100.00
2. Plus: 25% CPP Adjustment	$25.00
3. Per-Share Value of Taxpayer Stock, on a Controlling, Marketable Ownership Interest Basis	$125.00
4. Less: 50% DLOM Adjustment	($62.50)
5. Per-Share Value of Taxpayer Property , on a Controlling, Nonmarketable Ownership Interest Basis	$62.50
6. Valuation Adjustment—to be Applied to the $100 Per-Share Unadjusted Unit Value of Taxpayer Stock	37.5%

The appropriate application of the valuation adjustment in this illustrative example is presented in Exhibit 4.

Mathematically, the same valuation adjustment is achieved regardless of whether the CPP is applied first and the DLOM applied second—or whether the DLOM is applied first and the CPP is applied second.

Application of the Valuation Adjustment to the Unit Principle Property Appraisal

The valuation adjustment can be applied in the development of the unit principle property appraisal by either:

1. reducing any securities-derived valuation pricing multiples by the amount of the valuation adjustment,
2. increasing the cost of equity capital component of the direct capitalization rate (if derived directly from securities prices) by dividing the equity component by one minus the valuation adjustment, or
3. decreasing the equity component of the capital-market-derived total unit value by the amount of the valuation adjustment.

The stock and debt method relies on valuation pricing multiples derived from the GPTCs to estimate the value of the taxpayer's total unit. The valuation adjustment would be appropriate to reduce the "stock" component of the stock and debt method unit value indication.

The taxpayer property owner can also apply the valuation adjustment to the direct capitalization method. As mentioned above, the valuation adjustment would be made to the cost of equity capital component of the direct capitalization rate.

The analyst may increase the cost of equity component of the direct capitalization rate by dividing (1) the cost of equity by (2) one minus the valuation discount.

A valuation adjustment may also be applied directly to the equity component of the taxpayer total unit value indication derived from the direct capitalization method and/or the stock and debt method. Such a valuation adjustment may be applicable when these unit principle appraisal methods rely directly on securities pricing data. This final adjustment application will likely be less often applied than the two above-described applications of the valuation adjustment.

Conclusion

There are generally accepted unit principle property appraisal approaches and methods. These unit principle property appraisal approaches and methods are often applied in the tax appraisal of taxpayer property where multiple properties are physically, functionally, and economically integrated.

This discussion summarized the development of a valuation adjustment that may be considered when capital market data are used directly in a unit principle property appraisal.

Particularly when applying the direct capitalization method and the stock and debt method,

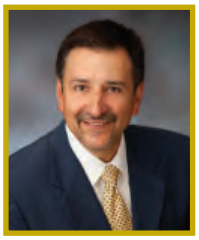
analysts sometimes use securities pricing data to derive capitalization rates, valuation pricing multiples, and other unit valuation variables. This direct use of securities pricing data (or pricing multiples) does not consider the liquidity—and other risk and expected return—investment difference between publicly traded securities and taxpayer operating property.

Therefore, analysts may apply a valuation adjustment to the securities-derived valuation variables in order to adjust for these investment attribute differences.

The measurement and application of such a valuation adjustment allows a unit principle property appraisal based on securities prices (and pricing multiples) to conclude a unit value that reflects the illiquidity (and other investment attributes) of the taxpayer's industrial or commercial property.

Notes:

1. Where *Mergerstat Review* does not report a transaction close date, it is not possible to calculate the market appreciation for the transaction. For these transactions, the market appreciation adjustment would equal 0 percent, and, therefore, the ownership control price premium may be overstated.
2. The average control price premiums were calculated only from transactions where the control premium percent offered was available.
3. Eliminating all strategic acquirers (i.e., direct competitors, customers, and suppliers) and leveraged buyouts does not entirely remove potential post-merger financial benefits. This is because post-merger financial benefits include some of the effects of higher leveraged, lower cost debt, and a corresponding decrease in the company's overall cost of capital, which is difficult to verify for each transaction. However, by eliminating strategic acquirers from consideration, the analyst mitigates post-merger operation synergies.
4. John D. Emory Sr. was formerly with Robert W. Baird & Co. where the studies prior to April 1997 were conducted.
5. John D. Emory, "The Value of Marketability as Illustrated in Initial Public Offerings of Common Stock—January 1980 through June 1981," *Business Valuation News* (September 1985): 21–24, also in *ASA Valuation* (June 1986): 62–66; "The Value of Marketability as Illustrated in Initial Public Offerings of Common Stock, January 1985 through June 1986," *Business Valuation Review* (December 1986): 12–15; "The Value of Marketability as Illustrated in Initial Public Offerings of Common Stock (August 1987–January 1989)," *Business Valuation Review* (June 1989): 55–57; "The Value of Marketability as Illustrated in Initial Public Offerings of Common Stock, February 1989–July 1990," *Business Valuation Review* (December 1990): 114–16; "The Value of Marketability as Illustrated in Initial Public Offerings of Common Stock, August 1990 through January 1992," *Business Valuation Review* (December 1992): 208–212; "The Value of Marketability as Illustrated in Initial Public Offerings of Common Stock, February 1992 through July 1993," *Business Valuation Review* (March 1994): 3–5; "The Value of Marketability as Illustrated in Initial Public Offerings of Common Stock, January 1994 through June 1995," *Business Valuation Review* (December 1995): 155–160; "The Value of Marketability as Illustrated in Initial Public Offerings of Common Stock, November 1995 through April 1997," *Business Valuation Review* (September 1997): 123–131; John D. Emory Sr., F.R. Dengel III, and John D. Emory Jr., "The Value of Marketability as Illustrated in Initial Public Offerings of Common Stock, May 1997 through December 2000, *Business Valuation Review* (September 2001): 15–19; and "Underlying Data in Excel Spreadsheet for 1980-2000 Pre-IPO Discount Studies, as Adjusted October 10, 2002," located at http://www.emoryco.com/valuation-studies.shtml.
6. See John D. Emory Sr., F.R. Dengel III, and John D. Emory Jr., "Discounts for Lack of Marketability: Emory Pre-IPO Discount Studies 1980–2000, as Adjusted October 10, 2002," www.emoryco.com/valuation-studies.shtml.
7. The database is available on a subscription basis from www.bvmarketdata.com.
8. The specific analytical procedures performed in the various WMA pre-IPO DLOM studies are detailed in Shannon P. Pratt, Robert F. Reilly, and Robert P. Schweihs, *Valuing a Business*, 4th ed. (New York: McGraw-Hill, 2000), 408–411.



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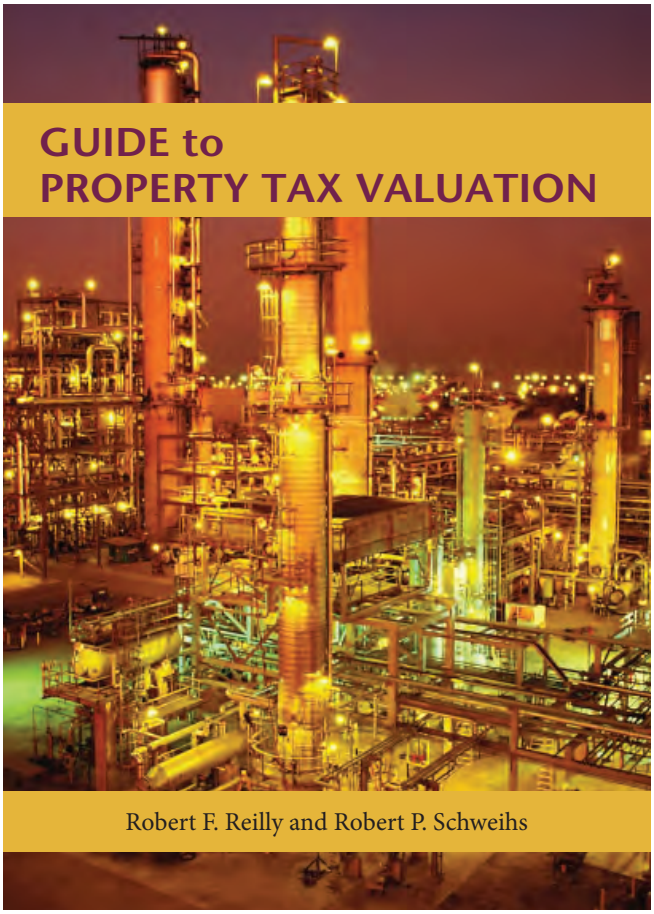

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Best Practices Discussion

Intellectual Property Valuations for Property Tax Purposes

Barry W. Purnell, Robert F. Reilly, CPA, and Charlene M. Blalock

Many industrial and commercial taxpayers are subject to the unit principle (sometimes called the utility principle) of appraisal for property tax purposes. In addition to centrally assessed utility-type taxpayers (e.g., electric companies, telephone companies, railroads, airlines, pipelines), locally assessed taxpayers in many industries are often subject to the unit valuation principle. Unit principle appraisals typically encompass the value of all of the taxpayer operating property, including working capital assets, real estate, tangible personal property, and intangible personal property. However, many taxing jurisdictions only tax real estate and/or tangible personal property for property tax purposes. Therefore, taxpayers operating in taxing jurisdictions that do not tax intangible property have to value such property—and exclude that value from the taxable bundle of taxpayer property. Many unit principle appraisal methods capture the value of the taxpayer's intellectual property, including patents and technology, copyrights, trademarks and trade names, and trade secrets and know-how. This discussion summarizes the application of the market approach—and particularly the relief from royalty method—to value a taxpayer's intellectual property. In particular, this discussion focuses on the valuation analyst's use of license royalty rate databases in the valuation of taxpayer intellectual property for ad valorem property tax purposes.

Introduction

Some taxing jurisdictions assess and then tax the value of an industrial or commercial taxpayer's intellectual property for ad valorem taxation purposes. That is, some taxing jurisdictions tax all of the tangible property and all of the intangible property of the industrial or commercial taxpayer.

Accordingly, such taxpayers—and such taxing authorities—need to know the value of the taxpayer's intangible property—including the intellectual property category of intangible property—that is subject to taxation.

However, many taxing jurisdictions only tax the real estate and/or tangible personal property of the industrial or commercial taxpayer. In those taxing jurisdictions, the value of the taxpayer's owned and operated intangible property (including intellectual property) is exempt from property taxation.

Accordingly, such taxpayers—and such taxing authorities—should ensure that the taxpayer's intangible property (including the intellectual property) are excluded from the total bundle of taxpayer property subject to property taxation.

This discussion summarizes the generally accepted approaches and methods related to the valuation of taxpayer intellectual property. In particular, this discussion focuses on the market approach—and the relief from royalty ("RFR") method—related to the valuation of the taxpayer's intellectual property.

This discussion describes the theoretical concepts supporting the RFR valuation method. And, this discussion presents several illustrative

examples of the application of the RFR method to value a taxpayer's intellectual property.

Unit Principle of Property Appraisal

Many categories of industrial or commercial taxpayers are subject to the so-called unit principle of property appraisal. When applying the unit principle property appraisal, all of the taxpayer's property is valued collectively, as an aggregate bundle—or a "unit"—of operating property.

Such a unit principle appraisal typically concludes the total value of all of the taxpayer's property, operating together as part of a going-concern business entity.

That total bundle—or unit—of taxpayer property typically includes working capital accounts, real estate, tangible personal property, intangible personal property, and goodwill and (what is often called) the present value of growth opportunities.

Utility-type taxpayers are often assessed based on the application of the unit principle of property appraisal. Any taxpayer company where the operating assets are physically, functionally, and economically integrated may be a candidate for the unit principle of property appraisal.

In contrast, other industrial or commercial taxpayers are assessed based on the summation principle of property appraisal. When applying the summation appraisal principle, each category (or each item) of taxpayer real estate and tangible personal property is appraised individually. These individual property values are added together—or "summed"—to conclude the total value of all of the taxpayer's operating property.

Some types of taxpayers are subject to the application of the unit principle appraisal because of statutory or regulatory requirements. Such requirements often apply to multijurisdictional taxpayers such as railroads, airlines, interstate and intrastate pipelines, telephone companies, electric generation and distribution companies, and others. These taxpayers are often (although not always) centrally assessed by state taxing authorities.

In addition, locally assessed property taxpayers may also be assessed based on the unit principle of property appraisal. Such taxpayers may include water and wastewater companies, local gas distribution companies, hospitals, nursing homes, marinas, racetracks, refineries, sports stadiums, theaters, golf courses and resorts, country clubs, hotels and hospitality properties, quarries, mines, CATV systems, and others.

Unit Valuation Principle and Summation Valuation Principle

Whether the taxpayer property is centrally assessed or locally assessed, the assessment is based on the unit principle of property appraisal if the following two components are included in the property appraisal:

1. The property income considered in the property appraisal is derived from the sale of goods and services.
2. The discount rates, capitalization rates, pricing multiples, or rates of return considered in the property appraisal are extracted from capital market (i.e., stock or bond market) data sources.

These two components may affect the property appraisal through income approach appraisal methods applied, the market approach appraisal methods applied, and the cost approach appraisal methods applied (typically through the analysis of economic obsolescence in the cost approach).

In contrast, the assessment (whether conducted by a state authority or a local authority) is based on the summation principle of property appraisal if the following two components are included in the property appraisal:

1. The property income considered in the property appraisal is derived only from the rental of real estate and tangible personal property.
2. The discount rates, capitalization rates, pricing multiples, or rates of return considered in the property appraisal are extracted from the sales of comparable properties.

These two components may affect the property appraisal through income approach appraisal methods applied, the market approach appraisal methods applied, and the cost approach appraisal methods applied (again, typically through the analysis of economic obsolescence).

Whether centrally assessed or locally assessed, many taxpayers are de facto assessed based on the unit principle of appraisal in taxing jurisdictions that do not tax intangible property. The unit principle appraisal conclusion includes the value of all of the taxpayer operating property, functioning collectively as a single unit.

Therefore, the unit appraisal conclusion typically includes the value of the taxpayer's working

capital assets, real estate, tangible personal property, and intangible personal property.

In many cases, the taxpayer (and the taxing authority) have to subtract (1) the value of the taxpayer's intangible property (including intellectual property) from (2) the taxpayer's total unit value in order to conclude (3) the residual value of the taxpayer's tangible property subject to property taxation.

Taxpayer Intellectual Property

This discussion focuses on what taxpayers, tax counsel, tax assessors, and valuation analysts ("analysts") need to know about one category of taxpayer intangible property: intellectual property. There are generally accepted cost approach, market approach, and income approach appraisal methods that may be used to value taxpayer intellectual property.

This discussion focuses on the application of the market approach. In particular, this discussion focuses on one market approach appraisal method—the RFR method.

The RFR method is often applied to value taxpayer intellectual property—particularly as a component of the unit valuation process. That is because the RFR method is particularly applicable to the appraisal of taxpayer intellectual property that should be subtracted from a total taxpayer unit value—in order to conclude the value of the taxpayer real estate and tangible personal property subject to property taxation.

The term "property" is a legal term. Property is subject to certain legal rights and protection, usually under state law. The term "assets" is an accounting term. An asset is recorded on an equity's balance sheet under the guidance of U.S. generally accepted accounting principles ("GAAP").

Not all property is recorded on a balance sheet prepared in compliance with GAAP. Not all assets qualify as property. These two terms are not synonymous. However, many analysts use these two terms interchangeably.

Therefore, for purposes of this discussion only, we will consider the term intangible personal property to be equivalent to the term intangible asset.

Categories of Taxpayer Intellectual Property

Royalty rate data are often applied in many types of intellectual property economic analyses. This statement is true with regard to intellectual property valuation, damages measurement, and transfer price determination analyses. And, this statement is particularly true for intellectual property appraisals developed for property tax planning, compliance, and controversy purposes.

This discussion explains and illustrates the use of royalty rate data within the context of an intellectual property appraisal prepared for property tax purposes.

For property tax purposes—as well as other purposes, there are four categories of intellectual property:

- Patents
- Trademarks
- Copyrights
- Trade secrets

Each of these intellectual property categories is summarized below.

As discussed below, royalty rate data are typically extracted from arm's-length, third-party commercial license agreements. Analysts should be aware that many arm's-length, third-party intellectual property license agreements encompass the use of both (1) intellectual property and (2) other intangible personal property.

Therefore, when using royalty rate data for property tax (and other) appraisal purposes, analysts should consider the bundle of intangible property that may be included in each license agreement—as well as the bundle of intellectual property legal rights that are included in each license agreement.

Patents and Related Intangible Property

This category of intellectual property includes the following types of patents:

- Utility patents
- Design patents
- Plant patents
- Process/method patents

In addition, third-party licenses (and other transfers) of patents often include the following taxpayer intangible property:

- Patent applications
- Technology sharing agreements
- Unpatented proprietary technology
- Regulatory approvals and licenses (e.g., FDA approvals, OSHA approvals)

- Technology development rights
- Engineering drawings and designs
- Schematics and technical documentation

Trademarks and Related Intangible Property

This category of intellectual property includes the following:

- Trademarks
- Trade names
- Service marks
- Service names
- Logos
- Trade dress

In addition, third-party licenses (and other transfers) of trademarks often include the following intangible property:

- Brand names
- Advertising programs
- Brochures and marketing materials
- Name-related goodwill

Copyrights and Related Intangible Property

This category of intellectual property includes copyrights related to:

- Literary works
- Musical works
- Dramatic works
- Pantomimes and choreographed works
- Pictorial, graphic, or sculptural works
- Motion pictures and audiovisual works
- Sound recordings
- Architectural works
- Computer software (including both object code and source code)

Third-party licenses (and other transfers) of copyrights may include the following intangible property:

- Engineering drawings
- Blueprints
- Manuals and procedures
- Training films

Trade Secrets and Related Intangible Property

This fourth and final category of intellectual property includes the following trade secrets and related documentation:

- Customer information
- Books and records
- Product formulas and recipes
- Procedures and know-how
- Pricing and cost information
- Accounting documentation

To maintain their confidentiality, trade secrets are rarely licensed in third-party license agreements. However, the sales and other transfers of trade secrets may include the following intangible property:

- Employee training materials
- Process flow charts
- Facility operation diagrams and schematics
- Financial plans and projections

Types of Intellectual Property Economic Analyses

License agreement royalty rate data are often used in the following types of intellectual property analyses:

- Valuation analyses (prepared for property tax and many other purposes)
- Damages measurement analyses (typically related to breach of contract claims and tort claims)
- Transfer price analyses (including both intercompany transfers and third-party transfers)

Third-party arm's-length license royalty rate data are often used in intellectual property valuation analyses. Such arm's-length license agreement royalty rate data are typically used in the application of the market approach and, in particular, the RFR method.

These arm's-length data may be used to estimate a defined value for the taxpayer owner/operator's intellectual property. In addition to valuation analyses, such royalty rate data are also used in transactional fairness opinion analyses.

Such an independent opinion may be requested by any transaction participant or contract counterparty to assess the fairness of the following:

- A proposed intellectual sale transaction price
- A proposed intellectual property license royalty rate
- The terms of a proposed intellectual property (or portfolio of intellectual property) exchange or other transfer transaction

In addition to their use in valuation analyses, license agreement royalty rate data are often used in intellectual property lost profits and other damages measurements. Such empirical data may be used to conclude a reasonable royalty rate damages measurement to an aggrieved intellectual property owner/operator. And, such a reasonable royalty rate may be used in a tort damages measurement or in a breach of contract damages measurement.

Finally, arm's-length royalty rate data are often used as a component of intellectual property transfer price analyses. For intercompany transfer price determination purposes, royalty rate data are often used in the comparable uncontrolled transaction ("CUT") transfer price measurement method.

Such transfer price analyses are typically performed in transactions related to the following:

- International intercompany transfers of intangible property
- Interstate intercompany transfers of intangible property
- Intercompany intellectual property transfers between controlled entities where one of the entities has a noncontrolling ownership interest
- Arm's-length transfers of intellectual property use rights in a third-party license agreement

Uses of Royalty Rate Data in Intellectual Property Analyses

In addition to appraisals developed for property tax planning, compliance, or controversy purposes, license royalty rate data are routinely applied in various intellectual property analyses developed for non-property-tax purposes.

These various analyses include the following

- Transaction analyses related to:
  - arm's-length sales of intellectual property,
  - arm's-length licenses of intellectual property,
  - intercompany transfers of intellectual property within a controlled entity, or
  - third-party transfers of intellectual property between a for-profit entity and a not-for-profit entity.
- Financing analyses related to:
  - intellectual property sale/licenseback and other financing collateral valuations or
  - debtor in possession or other intellectual property secured financing collateral valuations.
- Fair value measurement analyses related to:
  - GAAP acquisition accounting fair value measurements,
  - GAAP intangible asset impairment testing fair value measurements, or
  - GAAP post-bankruptcy fresh-start accounting fair value measurements.
- Federal taxation valuation analyses related to:
  - taxable (asset) acquisition transaction purchase price allocations,
  - basis in an intellectual property contributed by an equity holder to a corporation or a partnership,
  - charitable contribution deduction substantiation,
  - gift and estate tax planning and compliance,
  - intercompany transfer price arm's-length price ("ALP") determination,
  - taxpayer corporation solvency/insolvency analysis related to COD income recognition, or
  - the conversion of a C corporation to S corporation income tax status.
- Forensic analyses related to:
  - intellectual property infringement claim damages measurements,
  - intellectual property license breach of contract damages measurements,
  - condemnation and eminent domain taking of an entity's intellectual property, or
  - bankruptcy solvency/insolvency analysis of the intellectual property owner/operator.

Generally Accepted Intellectual Property Appraisal Approaches and Methods

There are generally accepted intellectual property appraisal approaches and methods. These generally accepted appraisal approaches and methods are described in numerous valuation textbooks, are included in valuation professional organization ("VPO") professional standards, are taught in VPO training and credentialing materials, and are tested on VPO valuation credentialing examinations.

A description of each of these generally accepted appraisal approaches and methods is beyond the scope of this discussion. All intellectual property appraisal methods are typically grouped into three generally accepted intangible property appraisal approaches: the market approach, the cost approach, and the income approach.

A listing of the generally accepted intellectual property appraisal methods within each approach is presented below:

- Market approach methods
  - Relief from royalty method
  - Comparable uncontrolled transactions method
  - Comparable profit margin method
- Cost approach methods
  - Replacement cost new less depreciation method
  - Reproduction cost new less depreciation method
  - Trended historical cost less depreciation method
- Income approach methods
  - Multiperiod excess earnings method
  - Capitalized excess earnings method
  - Incremental income method
  - Differential income method
  - Profit split method
  - Residual profit split method

Market Approach Intellectual Property Appraisal Considerations

In the application of market approach appraisal methods, the selected valuation pricing metrics are typically based on either comparable or guideline:

- licenses of intellectual property,
- sales of intellectual property, or
- companies that use intellectual property.

In the application of the intellectual property market approach, the valuation variables that analysts select—and the valuation procedures that analysts perform—typically include the following:

- Quantitative/qualitative analyses of the taxpayer's intellectual property
- Documentation of the guideline license/sale/company selection criteria
- Application of the guideline license/sale/company selection process
- Verification of the selected sale or license transactional data
- Quantitative and qualitative analysis of the selected sale or license transaction data
- Selection of the appropriate financial or operational pricing metrics to apply in the valuation analysis
- Selection of the specific pricing multiples to apply to the taxpayer's intellectual property
- Application of the selected pricing multiples to the taxpayer's intellectual property financial or operational metrics

Some of the individual factors that analysts consider in the application of the market approach appraisal methods include the following:

- Comparison of any seasoned guideline intellectual property to a taxpayer's development stage intellectual property
- Comparison of any development stage guideline intellectual property to a taxpayer seasoned intellectual property
- Assessment of the current state of the competition in the taxpayer (i.e., the intellectual property owner/operator) industry
- Assessment as a part of a comparable profit margin ("CPM") valuation method analysis: is the taxpayer's intellectual property the only reason for the difference in profit margins between the taxpayer (i.e., the intellectual property owner/operator) and the selected CPM companies?

Elements of the Intellectual Property Appraisal Analysis

The first element in any intellectual property appraisal is a complete definition of the taxpayer

intellectual property. This statement is true for intellectual property appraisals developed for any purpose. But this statement is particularly true for intellectual property appraisals performed for property tax purposes. This is because such appraisals are often subject to a contrarian review.

Particularly in the context of a taxpayer's intangible property exemption claim, the taxing authority will want to know exactly what intellectual property the taxpayer is claiming an exemption for. This is a legitimate question because the taxing authority wants to confirm that the intellectual property is, in fact, included in the taxpayer's total property assessment before the taxing authority allows the intangible property adjustment.

The intellectual property definition should specify exactly what patent, copyright, trademark, or trade secret is included in the valuation subject. This definition may include the registration number and country for an individual patent, copyright, or trademark (if registered). And, this definition will typically describe any other intangible properties hat are included with the taxpayer's intellectual property appraisal.

The second element in the intellectual property appraisal is a description of the bundle of legal rights included in the analysis. For example, the description of the bundle of intellectual property rights will typically indicate which one of the following bundles is included in the property tax appraisal:

- Fee simple interest
- Term/reversion interest
- Licensor/licensee interest
- Sublicensee interest
- Territory (domestic/international) interest
- Product line/industry interest
- Life/residual interest
- Use rights
- Development rights
- Commercialization/exploitation rights

The third element of the intellectual property appraisal typically describes any contract or license terms in effect with regard to the taxpayer's intellectual property. If the taxpayer's intellectual property is subject to either an inbound or an outbound license, the analyst typically summarizes the following licensor/licensee responsibilities and license/contract terms:

- Identity of the licensor and the licensee
- Term of the license agreement (including any renewal options)
- The intellectual property legal protection requirements
- The dollar amount and responsibility for research and development expenditures
- The dollar amount and responsibility for marketing, advertising, or other promotional expenditures
- Each party's responsibility to obtain and maintain any licenses, permits, or other regulatory approvals
- Any milestone dates for regulatory approvals, commercialization events, sales levels, etc.
- Any contractual minimum use, production, or sales requirements
- Any contractual minimum marketing, promotion, or commercialization expense requirements
- The responsibility for any research and development technology development payments, development completion payments, etc.
- Each party's responsibility to obtain the required regulatory approvals
- Any milestone license payments made for any reason
- Each party's rights to any future intellectual property developments
- Each party's rights to sublicense the taxpayer intellectual property

The fourth element of the intellectual property appraisal is the standard (or definition) of value that the analyst is asked to conclude. For intellectual property appraisals developed for various purposes, the following standards of value may apply:

- Fair value
- Fair market value
- Use value
- User value
- Owner value
- Investment value
- Acquisition value
- Collateral value

For appraisals performed for property tax purposes, the appropriate standard of value is typically determined by statutory authority or administrative rulings. Many taxing jurisdictions

apply jurisdiction-specific standards of value, including fair market value, market value, true cash value, and many others.

Most property-tax-related standards of value incorporate the concept of an arm's-length transfer between a hypothetical willing buyer and a hypothetical willing seller.

The fifth element of the intellectual property appraisal is the premise of value that the analyst applies. For property tax appraisal purposes, the premise of value is often determined by statutory authority or administrative ruling. For appraisals developed for other purposes, the appropriate standard of value may be selected based on the analyst's highest and best use analysis of the subject intellectual property.

The intellectual property premises of value include the following:

- Value in continued use
- Value in place (but not in use)
- Value in exchange—or an orderly disposition basis
- Value in exchange—on a voluntary liquidation basis
- Value in exchange—as an involuntary liquidation basis

Purpose of the Intellectual Property Appraisal

The purpose of the intellectual property appraisal considers the following questions:

- What will the appraisal be used for?
- Who will rely on (or receive a copy of) the valuation?
- What form and format of valuation report is required?
- Are there any legal instructions (e.g., specific statutory definitions, judicial precedent, or reporting requirements) that the analyst should consider?

In an intellectual property appraisal developed for property tax purposes, the answers to the questions should be agreed to between the analyst and the taxpayer (or tax counsel). Particularly for property tax appraisal purposes, the answers to these questions may come in the form of instructions or directions from the taxpayer's legal counsel.

Intellectual Property Appraisal Data Gathering and Due Diligence

For property tax appraisal purposes, the analyst typically gathers and analyzes information related to the taxpayer—that is, the intellectual property owner/operator.

Such taxpayer-specific information typically includes the following:

- Owner/operator historical and prospective financial statements at the "unit" level
- Owner/operator historical and prospective intellectual property development/maintenance costs
- Owner/operator current and expected resource/capacity constraints at the "unit" level

In this stage of the appraisal, the analyst typically documents a description and estimate of the intellectual property economic benefits to the taxpayer owner/operator.

Such taxpayer economic benefits may include the following:

- Any revenue increase associated with the taxpayer's intellectual property (e.g., related product unit price/volume, market size/position)
- Any expense decrease associated with the taxpayer's intellectual property (e.g., expense related to product returns, COGS, SGA, R&D)
- Any investment decrease associated with the taxpayer's intellectual property (e.g., inventory, capital expenditures)
- Any business risk decrease associated with the taxpayer's intellectual property (existence of intellectual property licenses/contracts, decrease of cost of capital components)
- An assessment of the intellectual property impact on the taxpayer owner/operator's strategic position: SWOT (strengths, weaknesses, opportunities, and threats)

The analyst may also consider the intellectual property's market potential outside of the taxpayer owner/operator. In this assessment of the intellectual property market potential, the analyst may consider the following factors:

- Change in the market definition or in the market size for an alternative (not the taxpayer) owner/user
- Change in alternative/competitive uses to an alternative (not the taxpayer) owner/user
- The subject intellectual property ability to create inbound/outbound license opportunities to an alternative (not the taxpayer) owner/user
- Whether the taxpayer owner can (1) operate the intellectual property and also (2) outbound license the intellectual property (in different products, different markets, different territories, etc.)

Review of Intellectual Property Financial Projections

As part of the property tax appraisal, the analyst often receives financial projections related to the taxpayer's business operations.

These financial projections may relate to the following levels within the taxpayer's business enterprise:

1. The total taxpayer company
2. The taxable unit of taxpayer operating assets
3. The taxpayer's intellectual property only

As part of the intellectual property appraisal, the analyst may review and challenge the following:

1. Any taxpayer-prepared financial projections
2. Any taxpayer-prepared measures of intellectual property economic benefits

In this due diligence of the taxpayer-prepared financial projections, the analyst may perform the following benchmark analyses:

- Compare the taxpayer's prior projections (if any) to prior actual results of operations
- Compare the taxpayer's projections to current capacity constraints
- Compare the taxpayer's projections to the current total market size
- Consider published industry average CPM profitability metric data
- Consider guideline publicly traded company CPM profitability metric data
- Consider the quality and quantity of available inbound or outbound license data
- Perform an intellectual property useful economic life ("UEL") analysis, with consideration of the following:
  - Legal/statutory life
  - Contract/license life
  - Technology obsolescence life
  - Economic obsolescence life
  - Lives of prior generations of the taxpayer's intellectual property
  - Position of the taxpayer's intellectual property in its life cycle

As part of the due diligence of the taxpayer's financial and operational data—and particularly of the taxpayer's financial projections—the analyst often considers industry data sources. These industry data sources may be used as benchmarks to test the reasonableness of taxpayer-projected profit margins and other financial metrics.

Some of the industry data sources that analysts typically use for such comparative benchmark analyses are listed in Exhibit 1.

In addition to industry data sources, analysts may consider financial and operational data related to guideline public companies that operate in the same industry as the taxpayer. The analyst may use these guideline company data as benchmarks to test the reasonableness of taxpayer-prepared profit margins and other financial metrics.

Some of the guideline company data sources that analysts typically use for such comparative benchmark analyses are summarized in Exhibit 2.

The various industry financial research and guideline publicly traded companies databases may be useful to analysts looking for industry profit margins and other financial metrics.

However, for purposes of intellectual property valuations, analysts should be aware that all of these databases have certain application strengths and weaknesses.

Several analyst considerations regarding the application strengths of the use of industry and guideline company databases are summarized in Exhibit 3.

Several analyst considerations regarding the application weaknesses of the use of industry and guideline company databases are summarized in Exhibit 4.

Exhibit 1
Taxpayer Intellectual Property Valuations
Typical Industry Data Sources
For Due Diligence Benchmark Analyses

1. Occupational Safety & Health Administration – The U.S. Department of Labor, Occupational Safety & Health Administration website provides Standard Industrial Classification ("SIC") codes. Codes can be searched by keyword, or the SIC code "tree" can be viewed and browsed. This resource is available at https://www.osha.gov/pls/imis/sicsearch.html.
2. U.S. Census Bureau – The U.S. Census Bureau North American Industry Classification System ("NAICS") website provides a searchable database of NAICS codes. NAICS codes are a more recent classification system than SIC codes. Therefore, they can be better for newer industries, such as some high tech industries. More information is available at https://www.census.gov/eos/www/naics/.
3. FirstResearch – FirstResearch is an industry research database that was developed to provide information for sales people. It provides an overview, valuation pricing multiples, growth rates, and information on how to analyze a company in a particular industry. Information is updated regularly. It is available from several different sources, including Business Valuation Resources, www.bvresources.com.
4. IBIS*World* – IBIS*World* is one of the largest independent publishers of U.S. industry research. Research includes information on major companies in the industry, growth rates, key financial data, and outlook for the industries. The research covers approximately 700 different market segments. Some international reports are also available. Information is updated quarterly for some industries and less frequently for other industries. IBIS*World* is available at www.ibisworld.com and also through other database aggregators.
5. CFRA Industry Surveys – CFRA Industry Surveys (formerly S&P Industry Surveys) are available on approximately 50 industry sectors. The reports provide global industry information as well as information on U.S. industries. Major companies are discussed, and detailed information on the recent past and the outlook for the future are provided. A glossary of specialized terms is provided. Also, comparable financial information on major companies in the industry is provided. The information is updated twice a year. These surveys are available from CFRA MarketScope Advisor, www.advisor.marketscope.com.
6. ABI/Inform – Articles from U.S. and international general interest and trade publications may be searched. This database is available at most libraries and through database aggregators.
7. Bloomberg Industries – This component of the Bloomberg database provides industry data, interactive charting, and written analysis from a team of industry experts. Contact information for each industry expert is provided so that an analyst can follow up with questions if needed. More information is available at www.bloomberg.com/professional/.
8. MarketResearch.com – This database provides access to industry and market research reports from many different sources. It provides information on products, trends, regions, demographics, industries, and companies from its collection of over 700 research publishers. More information is available at www.marketresearch.com.
9. S&P Capital IQ – This database provides access to analyst research as well as some market research reports. Capital IQ uses S&P industry classifications. These classifications can be helpful in grouping companies in comparable industries. In addition, comparative ratio information is available. More information is available at www.capitaliq.com.
10. Refinitiv Workspace (formerly Thomson ONE/Eikon) – This database provides access to analyst research and market research reports. More information is available at www.refiinitiv.com.
11. FactSet – FactSet also provides access to market research reports as well as analyst reports. The FactSet database is available at https://www.factset.com.
12. Westlaw – Articles from U.S. and international general interest and trade publications may be searched. Westlaw also provides access to the Investext analyst research database. More information is available at www.westlaw.com.
14. *Annual Statement Studies: Financial Ratio Benchmarks and eStatement Studies*, The Risk Management Association – Both the book and the online database contain financial statement ratios and common size balance sheet and income statement line items, arrayed by asset and sales size. Six different asset and sales size categories are presented. The book and database cover over 700 industries, sorted by NAICS codes. The book is issued annually. More information is available at www.rmahq.org and through BVDataWorld.

Exhibit 1 (continued)
Taxpayer Intellectual Property Valuations
Typical Industry Data Sources
For Due Diligence Benchmark Analyses

15. Duff & Phelps Cost of Capital Navigator – This is an online platform that guides analysts through the process of developing global cost of capital estimates. The Cost of Capital Navigator provides users with multiple alternative models and corresponding required inputs as they use their professional judgement in developing their own estimates. Equity risk premiums (historical, supply-side, and Duff & Phelps recommended), industry risk premiums, full information betas, and size premiums are available in this platform. In addition, industry profiles are available by GICS code. These profiles provide various financial ratios, capital structure, industry betas, and other industry-specific information.
16. *IRS Corporate Ratios*, Schonfeld & Associates, Inc. – This book includes 76 financial ratios that are based on the most recently available income statement and balance sheet data compiled by the IRS. The data focuses on the comparison of financial ratios for companies with and without net income. The contrast between profitable and unprofitable companies highlights which ratios are critical in the achievement of financial success. The book is issued annually. More information is available at www.saibooks.com. The data from this book are also available in database form through BVDataWorld.

Exhibit 2
Taxpayer Intellectual Property Valuations
Guideline Company Data Sources
For Due Diligence Benchmark Analyses

1. Bloomberg – Bloomberg is a fully searchable online database that provides financial information on nearly all (over 99 percent of total market capitalization) active and inactive U.S. publicly traded companies and active and inactive international companies. Companies may be searched by industry sectors or by SIC codes. Detailed financial information is available and updated frequently. More information is available at www.bloomberg.com/professional/.

2. MergentOnline – MergentOnline is a fully searchable online database that provides financial information on over 25,000 active and inactive U.S. publicly traded companies and 95 percent of non-US publicly traded companies. Companies are listed by SIC codes and by NAICS codes. More information is available at www.mergentonline.com.

3. S&P Capital IQ – S&P Capital IQ contains detailed information on approximately 62,000 publicly traded companies (both domestic and foreign), approximately 47,000 of which are active. The information is derived from documents filed with the Securities and Exchange Commission ("SEC") and similar global stock regulators (as well as proprietary research). The database may be searched by SIC code or by Standard & Poor's industry classifications. The information is updated frequently. More information is available at www.capitaliq.com.

4. Refinitiv Workspace – Refinitiv (formerly Thomson ONE and Thomson Eikon) is a fully searchable online database that provides financial information on approximately 77,000 public companies (54,000 of which are active). Companies may be searched by Global Industry Classification Standard ("GICS") codes or SIC codes. Detailed financial information is available. The information is updated frequently. More information is available at www.refinitiv.com.

5. FactSet – FactSet is an online database that can be screened by numerous criteria, including industry; business description; financial data such as revenue, earnings, or assets; geographic location; closing price; and other criteria. The database contains information on over 75,000 companies worldwide. Over 2,000 unique financial data items are provided. More information is available at www.factset.com.

Exhibit 3
Taxpayer Intellectual Property Valuations
Industry and Guideline Company Research Databases
Analyst Consideration of Application Strengths

First, these guideline publicly traded company and industry financial research databases are generally organized and searchable by industry classification. This organizational structure allows the analyst to identify financial data that may be relevant to the taxpayer's intellectual property.

Second, many of these databases have relevant benchmarks and financial data already compiled and presented in a useful format. This format allows the analyst to efficiently identify, select, and utilize relevant industry data.

Third, these databases generally present numerous financial benchmarks (gross profit margin, pretax profit margin, liquidity ratios, etc.). The variety of the available data allows the analyst to select the financial data that are most relevant to the taxpayer's intellectual property valuation.

Fourth, many of these databases allow the analyst to narrow search parameters to identify financial data only from companies of a specific size (based on asset size, revenue size, market capitalization size, etc.). This size feature may be useful to analysts as many financial benchmarks such as profitability may be affected by either economies of scale or diseconomies of scale.

Exhibit 4
Taxpayer Intellectual Property Valuations
Industry and Guideline Company Research Databases
Analyst Consideration of Application Weaknesses

First, the identification of the individual companies that are included in each industry may not be available.

Second, the analyst may not have access to the underlying financial data that are used to calculate the industry benchmarks. And, these data may include outlier observations, adjusted data, or other data anomalies that are not meaningful.

Third, some of the companies listed in each industry category may be incorrectly categorized.

Fourth, the taxpayer may not be sufficiently similar to any of the industries that are included in the database.

Fifth, there is often a time lag in the aggregation of the data presented in some of these data sources. Therefore, the data presented in the databases may be a few years old.

The Relief from Royalty Appraisal Method

The RFR method is one of the market approach appraisal methods that analysts apply to value intellectual property for property tax purposes—and for other purposes as well. The RFR method is based on a foundational assumption. The foundational assumption is that if the taxpayer did not own its intellectual property, it would have to inbound license that intellectual property from a third-party licensor.

An important procedure in the RFR method is the estimate of what amount of a license royalty rate the taxpayer would have to pay to inbound license the intellectual property from the third-party licensor.

Of course, the taxpayer actually owns its intellectual property. So, the taxpayer is "relieved" from having to pay a royalty payment related to such a hypothetical inbound license. Because the taxpayer owns its intellectual property, it experiences a "relief from royalty."

Of course, the analyst has to select a subject-specific royalty rate. That royalty rate is used to quantify the amount of license royalty expense the taxpayer is "relieved" from paying.

In the application of the RFR appraisal method, analysts typically consider two types of arm's-length license agreement royalty rate data:

- The actual license compensation data (i.e., the raw royalty data)
- Royalty compensation normalization adjustment data

First, analysts select and assess base (or raw) royalty rate data. The base royalty rate is the contractual compensation specified in the selected arm's-length intellectual property license agreement. These base rate data include the "noise" of the actual royalty license consideration arrangements.

Second, the royalty adjustment data are the license-specific terms needed to "normalize" the actual CUT royalty arrangements—in order to make these CUT license data more comparable to the hypothetical license of the taxpayer's intellectual property.

So, in order to identify and extract the normalization adjustment data, analysts need to read each of the selected CUT intellectual property license agreements.

License-Specific "Noise" May Be Encountered in the CUT Data

In applying the RFR method, analysts often have to deal with extraneous and unusable transactional data in their search for arm's-length CUT license agreements. These CUT license agreements are used to extract the market-derived, empirical royalty rate data needed to perform the RFR method appraisal analysis.

These normalization adjustments typically reduce the "noise" in what appears to be a wide range of aberrational and unrelated intellectual property license royalty rate data.

Analysts have to thoroughly review the third-party license agreements that are selected for consideration in the RFR method. The purpose of this review is to identify any terms and conditions that may need to be normalized. This normalization procedure is performed in order to make that CUT license agreement more useful to the RFR appraisal analysis.

Some of the license agreement normalization adjustments that analysts may look for include the following:

- Upfront fixed payments
- Milestone fixed payments
- Minimum/maximum fixed payments
- Litigation settlements or judicial orders
- Intercompany intellectual property transfers
- Equity transfers as part of the intellectual property license
- Unusually short or long license term periods
- An intellectual property sale transaction that is not a license
- A license royalty rate that is not expressed as a percent of licensee revenue
- A license royalty rate based on licensee sublicense income
- Multiple intellectual property assets included in the single license
- Product sale/distribution agreements
- Treatment of main/complementary products
- Relations of the intellectual property license to supplier, production, or other agreements

Other Factors That May Affect Intellectual Property License Royalty Rates

In addition to the license-specific "noise" terms that may need to be normalized in the selected CUT agreements, the analyst may consider industry and other general factors that affect intellectual property license royalty rate levels.

Analysts may consider these general factors that affect license royalty rates when analyzing the CUT data with respect to the taxpayer's intellectual property:

- State of the economy—at the CUT license inception date versus at the valuation date
- Size of the taxpayer's industry compared to the CUT industry
- Growth of the taxpayer's industry compared to the CUT industry
- Profitability of the taxpayer's industry compared to the CUT industry
- Market position of the taxpayer's intellectual property compared to the CUT intellectual property
- Market position of the CUT intellectual property in the CUT industry
- Position in the life cycle of the taxpayer's intellectual property
- Position in the life cycle of the CUT intellectual property

Three Procedures to Manage the "Noise" in Royalty Rate Data

Analysts often apply one of three procedures to manage the "noise" associated with any anomalous royalty rate data found in the CUT license agreements.

These three royalty rate "noise" mitigation procedures follow:

- Eliminate the anomalous royalty rate observations from the selected royalty rate data
- Quantitatively adjust for the impact of the normalization factors
- Qualitatively assess the impact of the normalization factors

In addition to these three procedures, analysts may use central tendency analyses that minimize the impact of any anomalous CUT royalty rate observations:

- Median royalty rate calculation
- Trimmed mean royalty rate calculation
- Interquartile range of license royalty rates

In applying the RFR method, it is often appropriate for analysts to eliminate from consideration those anomalous royalty rate observations that cannot be normalized or adjusted. However, in any intellectual property appraisal, it is generally inappropriate for analysts to eliminate from consideration any anomalous royalty rate observations just because they fall outside of the typical range of royalty rate observation (i.e., because the aberrational royalty rates are not "Goldilocks" observations).

Royalty Rate Data Sources

There are numerous commercial data sources that analysts may access to find arm's-length intellectual property license agreement royalty rate data. Some of the commercial intellectual property license agreement databases are summarized in Exhibit 5.

The databases listed in Exhibit 5 are useful to analysts for identifying arm's-length intellectual property license agreement royalty rate data. Analysts should be aware that each of these databases has data reliability strengths and weaknesses.

Exhibit 6 presents some of the analyst considerations regarding the application strengths of the intellectual property license databases.

Analysts should be aware that there are also limitations associated with the use of commercial intellectual license databases. Exhibit 7 presents some of the analyst considerations regarding the application weaknesses of the intellectual property license databases.

Analysts should consider all of these data reliability strengths and weaknesses when searching intellectual property license databases to extract royalty rates to use in the RFR method.

Intellectual Property Appraisal Illustrative Example

Let's consider the application of the RFR method to value a taxpayer's intellectual property. Let's assume the purpose of the appraisal is to claim an intangible property exemption claim to a property tax assessment. The Alpha Pharmaceutical Company ("Alpha") owns and operates a special purpose pharmaceutical product manufacturing plant in Taxem County.

The high-technology facility is a state-of-the-art manufacturing plant. The special purpose plant is a continuous-process facility that is physically, functionally, and economically integrated.

The Taxem County assessor valued the Alpha plant (including all real estate and tangible personal property) at $500 million as of the January 1, 2022, assessment date.

Even though the manufacturing plant is locally assessed, the assessor applied the unit principle of property appraisal to value the Alpha facility. The Taxem assessor applied both the income approach and the market approach to conclude the facility value.

Applying the income approach, the assessor capitalized the net operating income generated by the special purpose plant's business operations. The Taxem County assessor derived the direct capitalization rate from capital market data related to publicly traded pharmaceutical companies. Applying the market approach, the Taxem assessor multiplied the plant's earnings before interest, taxes, depreciation, and amortization ("EBITDA") by a market-derived pricing multiple.

The Taxem assessor extracted the pricing multiple from the recent sales of going-concern pharmaceutical manufacturing facilities. The Taxem assessor reconciled the income approach value indication and the market approach value indication and concluded the value of the Alpha special purpose facility.

Exhibit 5
Taxpayer Intellectual Property Valuation
Commercial Intellectual Property License Agreement Databases

1. ktMINE – ktMINE is an interactive intellectual property database that provides direct access to license royalty rates, actual license agreements, and detailed agreement summaries. The subscription-based database contains over 125,000 intellectual property license agreements. License agreements are searchable by industry, keyword, and various other parameters. The full text of each intellectual property license agreement is available. The ktMINE is available at www.bvmarketdata.com or at www.ktmine.com.
2. RoyaltySource – AUS Consultants offers a database that provides intellectual property license transaction royalty rates. This database, which is compiled from SEC filings and other sources, can be searched by industry, technology, and/or keyword. The information provided includes the license royalty rates, name of the licensee and the licensor, a description of the intellectual property licensed (or sold, if applicable), the transaction terms, and the original sources of the information provided. Preliminary results are available online, and a final report is sent to the subscriber via email. A subscription is not necessary. Analysts can pay per search. RoyaltySource is available at www.royaltysource.com.
3. RoyaltyRange – The RoyaltyRange database consists of manually gathered and analyzed data. RoyaltyRange reports contain more than 50 detailed standardized comparability factors on royalty rates and license terms. Each report is supplemented with original unredacted agreements, as well as filings and other types of documents. The RoyaltyRange database focuses on European transactions, but also contains some U.S. transactions. It excludes agreements between related parties, agreements with undisclosed remuneration mechanisms, royalty free agreements, agreements where royalties are expressed in other forms than percentage, and agreements with individuals, universities, and other noncommercial entities. The RoyaltyRange database is available at www.royaltyrange.com.
4. RoyaltyStat – RoyaltyStat is a subscription based database of intellectual property license royalty rates and license agreements, compiled from SEC documents. It is searchable by SIC code or by full text. The intellectual property transaction database is updated daily. The full text of each intellectual property license agreement in the database is available. RoyaltyStat is available at www.royaltystat.com.
5. IntangibleSpring – IntangibleSpring is a subscription based database of royalty rates sourced from license agreements filed with the SEC. Using a combination of text mining, natural language processing, and manual review, this database identifies and extracts complete license agreements from filings with the SEC. This database excludes agreements with incomplete pricing data. IntangibleSpring is available at www.intangiblespring.com.
6. Markables – This database is different from the other databases discussed above. Rather than drawing royalty rates from actual license transactions of intellectual property, Markables gathers its data from purchase price allocations published in SEC filings. It has over 12,000 trademark valuations published in the financial reports of publicly traded companies from all over the world. Each record contains trademark value, revenues, reported or implied trademark royalty rates, customer value, enterprise value, trademark profit split, and a detailed description of the business as of the date of the valuation. Markables is available at www.markables.net.

Taxem County only taxes real estate and tangible personal property. That is, intangible personal property (including intellectual property) is not subject to property tax in this jurisdiction.

Alpha management believes that the assessor's unit value conclusion includes the value of the intellectual property that Alpha owns and operates at the plant. Alpha management wants to claim an intangible property exemption related to the value of that intellectual property.

Alpha manufactures several pharmaceutical products at the Taxem County plant. However, the principal product manufactured at the plant is the patented and FDA-approved drug called Beta. Beta is an extremely effective (and extremely profitable) treatment for hypertension. Alpha management retained an analyst to value the Beta patent, proprietary technology, FDA license, and related intellectual property.

The analyst's valuation objective is to estimate the fair market value of the Beta pharmaceutical patent, proprietary technology, and related know-how that is owned and operated by Alpha at the Taxem County plant. The valuation date is January 1, 2022. Fair market value is the statutory definition

Exhibit 6
Taxpayer Intellectual Property Valuation
Intellectual Property License Databases
Analyst Consideration of Application Strengths

First, these databases allow the analyst to access thousands of license agreements. From these extensive collections of license agreements, the analyst may identify license agreements that are relevant to the valuation of the taxpayer's intellectual property.

Second, the extensive database search criteria allow the analyst to efficiently identify groups of potential license agreements that may be sufficiently similar to the taxpayer intellectual property. The analyst is able to search these databases based on (1) industry (SIC code or other classifications), (2) keyword, (3) time frame, (4) territory (worldwide or specific countries), and (5) a variety of other factors. Analysts may further narrow the search criteria to identify exclusive or nonexclusive licenses. These search criteria allow the analyst to identify a sample of potential license agreements through a relatively efficient, documented process.

Third, a strength of most of the above-mentioned databases is that the analyst may download the actual license agreements from the database. After selecting a sample of potential license agreements, the analyst should carefully review the actual license agreement in order to select royalty rate data that are sufficiently similar to the taxpayer's intellectual property.

Exhibit 7
Taxpayer Intellectual Property Valuation
Intellectual Property License Databases
Analyst Consideration of Application Weaknesses

First, there may be numerous duplicate license agreements included in these databases.

Second, there may be multiple updates of the same license agreement in the database (i.e., another type of data duplication).

Third, some "license agreements" may actually be asset purchase agreements or other types of transactional agreements. In other words, not every agreement is an intellectual property use license.

Fourth, some of the license agreements may be between related parties (and, therefore, may not be arm's-length agreements).

Fifth, some of the license agreements may involve several different types of intellectual property (e.g., a trademark and a patent), making it difficult for the analyst to extract a specific royalty rate for a single intellectual property.

Finally, the royalty consideration formula in the license agreement may be presented in a form that is not particularly useful to the analyst (e.g., a royalty dollar per 1,000 barrels of beer sold—rather than a royalty payment as a percent of licensee revenue).

of value used in Taxem County for ad valorem property tax purposes.

The analyst's valuation purpose is to assist Alpha management in its claim for an intangible property exemption related to its January 1, 2022, property tax assessment.

The analyst decided to apply the market approach and the RFR method to value the Beta patent, proprietary technology and related trade secret know-how.

Illustrative Royalty Rate Search Criteria

The analyst searched for arm's-length intellectual property license agreements from which to extract market-derived royalty rate data to use in the RFR valuation of the Beta patent.

The analyst selected (and documented) the following criteria for researching CUT intellectual property licenses:

- SIC code 2834, pharmaceuticals industry
- Technology intangible assets and manufacturing/process intangible assets
- Either the licensor or the licensee is a U.S. company
- No geographic territory restrictions
- No restrictions on the type of the agreement (other than it must be patent or technology related)
- License start date must be after January 1, 2017, and the license has to still be in effect as of January 1, 2022

The Initial License Royalty Rate Search Results

In this illustrative example, the analyst searched both the ktMINE database and the RoyaltySource database to identify pharmaceutical industry patent and technology license agreements. The analyst will apply the royalty rate data extracted from the commercial databases (1) to apply the RFR appraisal method and (2) to value the Beta patent-related intellectual property.

Using the ktMINE database, the analyst's initial search identified 72 potential CUT license agreements for further consideration. Using the RoyaltySource database, the analyst requested 30 randomly selected pharmaceutical industry technology license agreements for future consideration.

The license royalty rates indicated by the 102 potential CUT licenses ranged from 2 percent of the licensee's product revenue up to 100 percent of the licensee's product sublicense revenue.

After reviewing each of the 102 pharmaceutical industry technology license agreements, the analyst noticed that numerous license royalty rates were expressed as:

- a percentage of licensee gross profits,
- a percentage of licensee net profits,
- dollars per kilogram of product produced,
- a percentage of the license product manufacturing costs,
- a fixed dollar amount per time period, or
- a fixed dollar amount for the term of the license.

In selecting the appropriate royalty rate to use in the Beta patent-related appraisal, the analyst had to make sense of over 100 divergent intellectual property license royalty rate data points.

Types of License Agreements Included in the Commercial Databases

The analyst noted that there were numerous types of intellectual-property-related agreements included in the commercial databases.

In order to assemble a reasonable amount of usable pharmaceutical product patent royalty data, the analyst concluded that the following types of agreements could be eliminated (from consideration), adjusted (quantitatively normalized), or assessed (qualitatively normalized):

- Territory production/manufacturing agreements
- Territory product distribution agreements
- Sublicense agreements
- Trademark license agreements
- Intercompany transfer price agreements
- Nonpatent technology licenses
- Intangible asset sale agreements
- Joint product development agreements
- Joint venture commercialization agreements
- Access to product data and library research agreements
- Intellectual property infringement settlement and court order agreements
- Stockholder litigation settlement agreements
- Technical assistance agreements

Types of Products Included in the Commercial Databases

Even though the analyst restricted the database searches to pharmaceutical industry patents, a wide array of license agreements were captured in the intellectual property royalty rate search.

To achieve a manageable number of usable royalty rate observations, the analyst concluded that the following products could be eliminated (from consideration), adjusted (quantitatively normalized), or assessed (qualitatively normalized):

- Generic drug products
- Cosmetic products
- Nonhuman drug products
- Medical and surgical device products
- Radiation delivery systems
- Over-the-counter products
- Dietary supplement products

- Nonprescription skin care products
- Multiple pharmaceutical products (multiple product portfolios)
- Multiple patents and know-how (multiple intellectual property portfolios)

Types of License Compensation Included in the Commercial Databases

Ideally, the analyst is searching for license agreements that have a royalty rate expressed as a percent of the licensee's product revenue. Such royalty rates are easier to apply in the RFR method. And, such royalty rates would be easy to apply to the RFR appraisal of the Beta patent, proprietary technology, and related know-how intellectual property.

However, the analyst's initial search of the 102 license agreements produced a very wide range of royalty rate compensation formula, plans, and methods.

In order to achieve a reasonable number of useful royalty rate observations, the analyst decided that these license royalty consideration arrangements could be eliminated (from consideration), adjusted (quantitatively normalized), or assessed (qualitatively normalized):

- A profit split percentage of the licensee gross profits
- A profit split percentage of the licensee net profits
- A profit split percentage of the licensee product profits
- A percentage of the sublicensee revenue/income
- A percentage of the licensee product manufacturing costs
- A percentage of the licensee total costs
- A percentage of some specified exit event price or consideration
- A percentage of the FMV assigned to the subject intellectual property
- A dollar amount per unit volume/weight of product produced

The analyst noted that some of these license consideration arrangements could be useful in the application of profit split appraisal methods or of cost plus appraisal methods. However, these license consideration methods were not particularly applicable in the application of the RFR method.

The analyst also noted that, with some supplemental analysis, some of these license consideration arrangements could be converted into a percent of revenue royalty rate equivalent—that could be used in the application of the RFR method.

Examples of the Elimination of Royalty Rate Noise

Exhibit 8 illustrates several of the license agreements that the analyst had to eliminate from future consideration. The type of license agreement compensation arrangements did not lend themselves to use in the RFR method.

That is, the analyst was searching for intellectual property license agreements where the royalty rate was expressed as a percent of the licensee's pharmaceutical product revenue.

Examples of the Quantitative Adjustment (Normalization) of Royalty Rate Noise

The analyst's search produced numerous license agreements that had complex royalty compensation arrangements. However, with additional due diligence and research, the analyst could adjust the complex royalty arrangements to indicate an equivalent royalty rate expressed as a percent of licensee's revenue.

Exhibit 9 illustrates several of these quantitative adjustments that the analyst made to reduce the "noise" in the raw license agreement royalty rate data.

Examples of Qualitative Assessment (Normalization) of Royalty Rate Noise

The analyst noted that many of the license royalty consideration formulas were expressed as a percent of the licensee's product revenue. However, some of these licenses were also complex agreements. That is, the intellectual property license agreements were tied to manufacturing, joint venture, distribution, or other agreements.

In some of the agreements, a more fulsome bundle of assets was being licensed. In these cases, the analyst applied experience and judgment—as well as quantitative industry research—to qualitatively assess and adjust the license royalty rate arrangement.

Exhibit 8
Alpha Pharmaceutical Company
Beta-Patent-Selected Intellectual Property Valuation
Elimination of Royalty Rate Observations

Intellectual Property Licensor	Intellectual Property Licensee	Intellectual Property License Rights Transferred	License Royalty Consideration Formula
Cypress Pharmaceuticals	Pediatrix	Rights to distribute the product Granisol	$1,000/month
Allergan	Nektar Therapeutics	Collaboration agreement to develop the product Levadex	50% of the product profits/loss
Axiom Pharmaceuticals	Biodelivery Sciences	Rights to the BWEMA patent and to develop new related products	#375,000/quarter
Epicept Corp.	Epicept GmbH	Compensation agreement to develop Caplene for AML remission treatment	$2,000/day/employee
Columbia Laboratories	Scientelle	Right to use the patent to develop a diabetes drug for the licensor	150% of the product development expenses—to the licensee
Pharmos Corp.	Reperico Pharmaceuticals	Product development agreement—right to use the patent to develop small molecular drugs	50% of the fair market value of an exit (sale) event

As illustrated in Exhibit 10, many of these assessments involve the analyst's royalty rate conclusion that is "less than" or "more than" the CUT license agreement stated royalty rate.

Exhibit 11 presents the CUT licenses that the analyst selected for use in the RFR method appraisal of the Beta patent, proprietary technology, and related know-how intellectual property.

Examples of Selected CUT Royalty Rate Data for the Beta Intellectual Property Appraisal

The analyst noted that some (although relatively few) of the potential CUT license agreements were, in fact, "Goldilocks" licenses. That is, for the most part, these selected license agreements were "just right." That is, they provided particularly useful market-derived arm's-length agreement royalty rate data that could be used to value the Alpha intellectual property.

Application of the Relief from Royalty Appraisal Method

At this point in the analysis, the analyst has accessed intellectual property license databases, developed license agreement selection criteria, selected and reviewed 102 license agreements, and assembled (and normalized) empirical royalty rate data.

Based on the analyst's assessment of the market-derived royalty rate data, the analyst has to answer the question: what is the appropriate market-derived royalty rate to use in the Beta patent-related intellectual property appraisal? That is, what is the market-derived royalty rate for the appraisal of Alpha's intellectual property?

Exhibit 9
Alpha Pharmaceutical Company
Beta-Patent-Related Intellectual Property Valuation
Adjustment of Royalty Rate Observations

Intellectual Property Licensor	Intellectual Property Licensee	Intellectual Property License Rights Transferred	License Royalty Consideration Formula	Analyst's Quantitative Royalty Rate Adjustment
Glycomed	Paringenix	Patent rights to develop variations of the named products	100% of sublicense revenue	8% of revenue [a]
Keryx Biopharma	Torii Pharma	Right to use patent and technology to manufacture products to treat inflammatory cutaneous disorders	15% of manufacturing cost	7.5% of revenue [b]
Deponed	Solvany Pharma	Right to use patents, know-how, and technology to develop and manufacture pain medicine delivery device	15% of revenue	7.5% of revenue [c]
Impax Labs	Medicis Pharma	Rights to use patents, know-how, and technology to develop products for treatment of oral acene	25% of pretax profit	10% of revenue [d]
Columbia Labs	Coventry Pharma	Rights to patents and patented applications to develop small modular immune-pharmaceutical products	50% of pretax profit	7.5% of revenue [e]
DVSA Pharma	River's Edge Pharma	Rights to use patents and technology to develop and manufacture products for stated gastro-intestinal disease	$5 million plus 25% of gross profit	10% of revenue [f]

[a] Assumes that 100 percent of the sublicense revenue becomes pretax margin; 8 percent is the average pretax margin in this industry sector.
[b] Manufacturing cost equals about 50 percent of product revenue in this industry sector.
[c] As a rule of thumb, medical device licenses generally generate about twice the royalty rate as pharmaceutical product licenses.
[d] Gross profit margin is approximately equal to 40 percent of revenue in this industry sector.
[e] Pretax margin is approximately 15 percent of revenue in this industry sector.
[f] Gross profit margin is approximately 40 percent of revenue; the $5 million up-front payment settled a patent infringement lawsuit between the licensor and the licensee.

Exhibit 10
Alpha Pharmaceutical Company
Beta-Patent-Related Intellectual Property Valuation
Assessment of Royalty Rate Observations

Intellectual Property Licensor	Intellectual Property Licensee	Intellectual Property License Rights Transferred	License Royalty Consideration Formula	License Agreement Contract Term	Analyst's Qualitative Royalty Rate Adjustment
Hoffman-La Roche	Meda AB	Rights to patents, trademarks, and all intellectual property, inventory, contracts, and manufacturing technology—in an asset purchase agreement	10% of revenue	6 years	Less than 10% of revenue [a]
Combinatorix	Fovea Pharma	Collaboration agreement—right to collaborate to develop ophthalmic medicine to treat BOE diseases	4% of revenue	10 years	More than 4% of revenue [b]
CIBA Vision	Novartis Pharma	Right to use technology to develop a benzoporphyrin derivative mono acid ring for use in cataract surgery	20% of revenue	10 years	Less than 20% of revenue [c)
Coventry Pharma	Watson Pharma	Right to use patent, trademark, copyrights, regulatory filings, and promotional materials to develop Progesterone products	10% of revenue	Unit last intellectual property expires	Less than 10% of revenue [d]
PDL Biopharma	Alexion Pharma	Right to use PDL antibody patent family in the development and manufacture of other licensed pharmaceutical products	4% of revenue	Term of other licenses	More than 4% of revenue [e]

[a] The licensee is paying for the acquisition of a going-concern business.
[b] Both the licensor and the licensee have to contribute to the development of any new drug product.
[c] Medical devices typically extract higher royalty rates; this license also gives the licensee the right to buy materials from the licensor at cost.
[d] Includes multiple intellectual property assets and the right to operate a going-concern business.
[e] Patent can only be used with other licensed products; that contract arrangement also generates license royalty income to the licensor.

The purpose of this appraisal is to quantify the intangible property exemption related to the unit principle appraisal of Alpha's special purpose manufacturing facility in Taxem County.

As part of the RFR method appraisal, the analyst eliminated royalty rate data that did not present meaningful license royalty consideration. Then, the analyst adjusted the royalty rate data to indicate an adjusted range of royalty rates of 7.5 percent to 10 percent of licensee product revenue.

This adjustment procedure produced the following royalty rate indications:

- Mean royalty rate – 8.4 percent of revenue
- Median royalty rate – 8 percent of revenue

Exhibit 11
Alpha Pharmaceutical Company
Beta-Patent-Related Intellectual Property Valuation
Selected Royalty Rate Observations

Intellectual Property Licensor	Intellectual Property Licensee	Intellectual Property License Rights Transferred	License Agreement Conduct Term	Licensor Royalty Rate Compensation
Cominatrix	Alphah Plan	Right to use patent and clinical research to adopt Prednisporin to treat glaucoma	6 years	8% of revenue
Cosmo Pharma	Santorus	Right to use patents and know-how to develop products containing Budesonide to treat ulcerative colitis	6 years	7% of revenue
Eli Lilly	United Therapeutics	Right to use patents and technology to develop and commercialize prescription products for treatment of pulmonary hypertension	20 years	6% of revenue
Baxter International	Eleison Pharma	Right to patent and technology to improve Glufosfamide related to the treatment of cancer	9 years	8% of revenue
Auxilium Pharma	Biospecifics	Right to use BTC patents in the development of the next generation of products to treat Peyronie's Disease	8 years	8.5% of revenue

- Mode royalty rate – 7.5 percent of revenue

As illustrated above, the analyst assessed royalty rate data that indicated a greater than/less than royalty rate range. Those data were the result of the analyst's qualitative assessment of the royalty rate noise in the entire sample of intellectual property licenses.

With regard to the Beta-related intellectual property, the greater than/less than range of royalty rates indicated the following:

- Royalty rate greater than 4 percent of revenue
- Royalty rate less than 20 percent of revenue
- Modes – greater than 4 percent of revenue, less than 10 percent of revenue

Based on the most comparable of the sample of license agreements, the analyst selected CUT royalty rate data that indicated a range of 6 percent to 8.5 percent of revenue. These selected license agreements are sometimes referred to as "Goldilocks" agreements.

Based on the similarities of these selected licenses to the Beta-patent-related intellectual property, these individually selected agreements are "just right."

The final selection of CUT license agreements indicated the following royalty rate range:

- Royalty rate mean – 7.5 percent of revenue
- Royalty rate median – 8 percent of revenue
- Royalty rate mode – 8 percent of revenue

Based on all of the above-described empirical royalty rate data, the analyst selected a royalty rate of 8 percent of revenue for use in the RFR method appraisal of the Beta-related intellectual property.

In addition to applying the selection criteria described above, the analyst considered the following factors in the final selection of the 8 percent of revenue royalty rate for the Beta-related intellectual property appraisal:

- The relative profitability of the Beta product compared to the CUT patent products, including consideration of the relative profit margins of Beta versus the CUTs and the relative returns on investment of Beta versus the CUTs
- The relative total size of the Beta market compared to the market sizes of the CUT patent markets
- The relative growth rate of the Beta market compared to the growth rates of the CUT patent markets
- The relative position of the Beta product in its market compared to relative position of the CUT patent products in their respective markets
- The relative availability of substitutes for the Beta product compared to relative availability of substitutes for the CUT patent products
- The relative age of the Beta product in its life cycle compared to relative ages of the CUT patent products in their life cycles

The analyst recognized that, ideally, these comparative analyses are prepared on a patent-to-patent (or product-by-product) basis. However, based on data constraints, these comparative Beta/CUT intellectual property analyses may have to be developed on either:

1. a company-to-company basis or
2. an industry-to-industry basis.

Relief from Royalty Appraisal Method Illustrative Example

Exhibit 12 presents the analyst's application of the RFR method to estimate the fair market value of the Alpha Pharmaceutical Company's Beta patent-related intellectual property. This intellectual property appraisal is based on the market-derived intellectual property license analysis described above.

The analyst derived the other valuation variables applied in the RFR analysis after rigorous due diligence and consultation with Alpha management. A summary description of the selected valuation variables is presented in the footnotes to Exhibit 12.

Relief from Royalty Method Appraisal Summary

Alpha management retained the analyst to estimate the fair market value of the Beta intellectual property (i.e., the patent, proprietary technology, and related know-how trade secrets), as of January 1, 2022. The Alpha manufacturing facility was assessed by Taxem County based on a unit principle appraisal analysis.

That unit principle appraisal included the value of all of the Alpha (1) working capital assets, (2) real estate, (3) tangible personal property and (4) intangible personal property. Alpha retained an analyst to prepare the intellectual property appraisal in order to claim an intangible property exemption with regard to the Taxem County assessment of the special purpose pharmaceutical manufacturing facility.

The analyst concluded that the market approach and the RFR method was most appropriate to value Alpha's intellectual property. The analyst performed a comprehensive search—and a rigorous analysis—of CUT pharmaceutical product patent license agreements. Based on both quantitative and qualitative factors, the analyst selected a market-derived royalty rate to apply to the RFR method appraisal.

Working with Alpha management, the analyst developed the other valuation variables needed to complete the RFR method appraisal.

Based on the results of the RFR appraisal, and as summarized in Exhibit 12, the analyst concluded that the fair market value of the Beta-related intellectual property, as of January 1, 2022, was: $130 million.

Alpha management used this intellectual property appraisal to request an intangible property exemption with regard to the $500 million assessment of Alpha's special purpose manufacturing facility located in Taxem County.

Intellectual Property Valuation Analyst Caveats

There are several caveats that analysts should consider with regard to the application of the RFR method to value taxpayer intellectual property for property tax planning, compliance, or controversy purposes.

First, analysts should use several intellectual property license databases, if possible. Of course, there is a cost to using multiple databases. However, the use of several databases typically results in a more comprehensive sample of CUT license agreements.

Second, it is important for the analyst to understand what intellectual property is included in

Exhibit 12
Alpha Pharmaceutical Company
Beta-Patent-Related Intellectual Property Valuation
Market Approach—Relief from Royalty Appraisal Method
Fair Market Value
As of January 1, 2022
(in $ millions)

	Projection Period								
Beta Patent-Related Intellectual Property Appraisal Analysis [a]	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9
Beta Product Expected Revenue Growth Rate [b]	10%	10%	10%	0%	0%	0%	-12%	-12%	-12%
Beta Revenue Amount (year 0 base revenue = 400)	440	484	532	532	532	532	469	412	363
Selected Patent License Royalty Rate	8%	8%	8%	8%	8%	8%	8%	8%	8%
Projected License Royalty Expense Relief (founded)	35	39	43	43	43	43	38	33	29
Projected Income Tax Expense (40% income tax rate) [c]	14	16	17	17	17	17	15	13	12
Projected Net License Relief Expense Relief (rounded)	21	23	26	26	26	26	23	20	18
Present Value Discount Factor (at a 12% rate, using the midyear convention) [d]	94	84	75	67	60	54	48	43	38
Present Value of License Royalty Expense Relief	20	19	20	17	16	14	11	9	7
Total Present Value of License Royalty Relief	133								
Fair Market Value of the Beta-Patent-Related Intellectual Property (rounded)	130								

[a] The expected useful economic life ("UEL") of the Beta product patent in 9 years; this UEL is based on Alpha management's projection of the Beta product economic life. Alpha management is currently developing a replacement product. And, there are competitive pharmaceutical products that are beginning to enjoy market acceptance in competition to Beta.
[b] The analyst derived the projected revenue growth/decline rates (in conjunction with Alpha management) based on an analysis of similar drug product revenue growth/decline rates during the last half of their respective product patent life cycles.
[c] Assumes a 40 percent combined (federal and state) effective income tax rate, consistent with the income tax rate used in the unit principle appraisal of the Alpha manufacturing facility.
[d] Assumes a 12 percent after-tax present value discount rate, consistent with the after-tax weighted average cost of capital used in the unit principle appraisal of the Alpha manufacturing facility.

the valuation subject, what taxpayer industry is included in the valuation subject, and what bundle of intellectual property legal rights is included in the valuation subject.

Third, it is a best practice for the analyst to print and read each individual license agreement that may provide empirical royalty rate data.

Fourth, it is also a best practice for the analyst to examine each selected license agreement for terms and conditions that may justify the elimination, adjustment, or assessment of—or the analyst's reliance on—the market-derived license royalty rate data.

Fifth, the analyst should be aware that the commercial license databases may include documents other than arm's-length intellectual property license agreements.

For example, these commercial databases may also include the following types of transactional documents related to intellectual property:

- Business acquisition asset purchase agreements
- Intangible property intercompany transfer price agreements
- Product sale, manufacturing, or distribution agreements
- Joint venture, collaboration, development, etc., agreements

Sixth, the analyst should be aware that there are various types of license royalty compensation formula that are not particularly useful to an RFR method royalty rate analysis. That is, these royalty formula present compensation methods other than a royalty expressed as a percent of licensee revenue.

Examples of these other license compensation formula include the following:

- A dollar amount per unit sold or produced
- A dollar amount per time period
- Equity (stock shares) as a license payment
- A percentage of licensee gross profit or net profit

Seventh, and finally, the analyst should be prepared to eliminate, adjust, and assess the market-derived license royalty rate data in order to extract the most meaningful intellectual property pricing metrics. Intellectual property valuation analysts should be comfortable with this generally accepted valuation procedure.

For example, real estate appraisers regularly eliminate, adjust, and assess empirical sales data in performing real estate appraisals. And, business valuation analysts regularly eliminate, adjust, and assess guideline company pricing multiple data in performing market approach business valuations.

Therefore, the procedure to eliminate, adjust, and assess empirical royalty rate data should be a well-used tool in the intellectual property valuation analyst's toolbox.

The Effective Intellectual Property Valuation Report

In addition to developing the intellectual property appraisal analysis, the analyst typically has to prepare a narrative valuation report. In order to encourage the report reader's acceptance, the effective intellectual property valuation report should be:

- clear, convincing, and cogent;
- well organized, well written, and well presented;
- free of grammar, punctuation, spelling, and mathematical errors; and
- procedurally and mathematically replicable, without the use of any unexplained or unsourced valuation variables.

Particularly with regard to a report prepared for property tax purposes, the persuasive intellectual property valuation report should tell a narrative story that:

- defines the analyst's assignment;
- describes the analyst's data gathering and due diligence procedures;
- justifies the analyst's selection of (and rejection of) the generally accepted intangible asset appraisal approaches, methods, and procedures;
- explains how the analyst performed the valuation reconciliation and synthesis and how the analyst reached the final value conclusion;
- defends the analyst's intellectual property value conclusion; and
- describes all of the data sources that the analyst relied on in the appraisal (and includes copies of nonpublic source documents).

Particularly with regard to a report prepared for property tax purposes, an effective intellectual property valuation report will avoid these errors:

- Failure to apply the defined standard of value

- Failure to apply the defined premise of value
- Analytical internal inconsistencies
- Arithmetic errors in the intellectual property appraisal analysis
- Insufficient support for the selected valuation variables
- Reliance on industry or other rules of thumb
- Insufficient data and inadequate market research
- Inadequate due diligence procedures

In particular, expert reports prepared for property tax controversy purposes should be comprehensive. Typically, all of the analyst's valuation procedures and thought processes will be documented in the expert report.

Analysts who prepare appraisal analyses in property tax controversy cases may be familiar with this valuation report guidance: "if it's not in your report, you didn't do it."

Summary and Conclusion

Analysts understand that there is a lot of "noise" included in the intellectual property license database royalty rate raw data. Nonetheless, analysts can effectively use these empirical royalty rate data to develop intellectual property appraisals for property tax (and for other) purposes.

Analysts often use the "eliminate, adjust, and assess" procedures summarized in this discussion to reach a reasonable range of royalty rates—and a final, supportable intellectual property royalty rate conclusion.

However, analysts should not use the so-called "Goldilocks" procedure. That is, analysts should not:

1. select a predetermined intellectual property royalty rate that is "just right" for the subject appraisal and then
2. eliminate, adjust, and assess the empirical data in order to justify the predetermined "just right" intellectual property royalty rate.

There are many reasons to value a taxpayer's intellectual property within a property tax context. There are also many reasons to value intellectual property outside of the property tax content.

There are generally accepted approaches, methods, and procedures with regard to the appraisal of intellectual property. Taxpayers, tax counsel, assessment authorities, and analysts should be familiar with these generally accepted appraisal approaches and methods. For many types of intellectual property, the market approach is a particularly applicable appraisal approach.

This discussion focused on the application of the market approach RFR appraisal method to value taxpayer intellectual property for ad valorem property tax planning, compliance, and controversy purposes.

In applying the RFR appraisal method, analysts typically access various commercial databases. These databases are used to extract market-derived royalty rates from the arm's-length licenses of intellectual property assets that are sufficiently similar to the taxpayer's intellectual property. These arm's-length intellectual property licenses are frequently referred to as comparable uncontrolled transactions—or CUTs.

This discussion presented an illustrative example of the application of the RFR method to value taxpayer's intellectual property. This example considered the analyst's appraisal of the hypothetical Beta patent method intellectual property for the Alpha Pharmaceutical Company.

Particularly with regard to intellectual property appraisals prepared for property tax controversy purposes, analyst should be prepared to explain all selections, rejections, or adjustments of available license royalty rate data.

If the license market for the taxpayer's intellectual property is efficient, then the analyst should be able to modulate the noise in the license royalty rate data—and be able to reach a reasonable range of royalty rates and a supportable intellectual property value conclusion.

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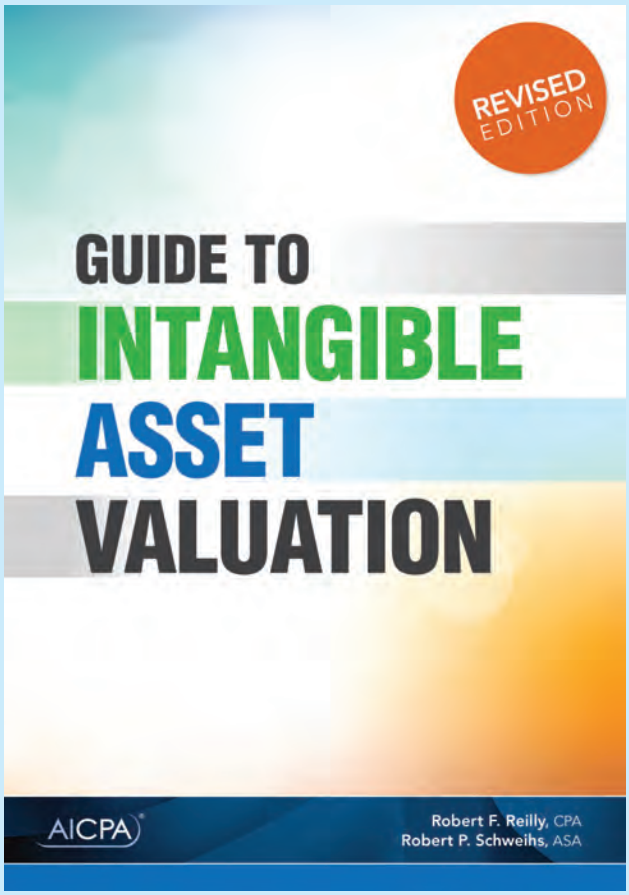
Guide to Intangible Asset Valuation

by Robert F. Reilly and Robert P. Schweihs



This 745-page book, originally published in 2013 by the American Institute of Certified Public Accountants, has been improved! The book, now in hardback, explores the disciplines of intangible asset valuation, economic damages, and transfer price analysis. *Guide to Intangible Asset Valuation* examines the economic attributes and the economic influences that create, monetize, and transfer the value of intangible assets.

Robert Reilly and Bob Schweihs, Willamette Management Associates managing directors, discuss such topics as:

- Identifying intangible assets and intellectual property
- Structuring the intangible asset valuation, damages, or transfer price assignment
- Generally accepted valuation approaches, methods, and procedures
- Economic damages due diligence procedures and measurement methods
- Allowable intercompany transfer price analysis methods
- Intangible asset fair value accounting valuation issues
- Valuation of specific types of intangible assets (e.g., intellectual property, contract-related intangible assets, and goodwill)

Illustrative examples are provided throughout the book, and detailed examples are presented for each generally accepted (cost, market, and income) valuation approach.

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- Litigation counsel involved in tort or breach of contract matters
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Guide to Intangible Asset Valuation

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Thought Leadership Discussion

The Property-Specific Risk Premium and Unit Principle Property Appraisals

Connor J. Thurman and Robert F. Reilly, CPA

Analysts are often asked to appraise a taxpayer's industrial or commercial property for property tax compliance, appeal, or litigation purposes. Often, analysts apply the summation valuation principle to appraise such industrial and commercial property. For complex properties that are physically, functionally, or economically integrated, analysts sometimes apply the unit valuation principle to appraise the industrial or commercial property. These analysts apply generally accepted unit principle property appraisal approaches and methods. Most of property appraisals involve the analyst's measurement of cost of capital. This cost of capital becomes the basis for the analyst's development of the applicable yield capitalization rate or direct capitalization rate. For most unit principle appraisals, the yield capitalization rate and direct capitalization rate include the analyst's estimate of a property-specific risk premium ("PSRP"). This discussion explains the reasons why the PSRP should be included in the various cost of capital measurement models. This discussion describes the qualitative factors that the analyst considers in the judgment-based PSRP estimate. This PSRP estimate is one component of what is often called "alpha" in the measurement of a property-specific cost of capital. This discussion also summarizes the market-derived, empirical data sources that the analyst may consider as a proxy—or benchmark—in the quantitative estimate of the PSRP. These empirical data sources do not directly measure the PSRP. That is because the PSRP is unique to the subject property. However, these empirical data sources provide general guidance to support the PSRP estimate. Finally, this discussion summarizes one procedure that impacts both the qualitative and quantitative assessment of the PSRP: the functional analysis of the taxpayer property.

Introduction

Ad valorem property taxation, by definition, is based on the value of the taxpayer's property. Valuation analysts ("analysts") apply generally accepted property appraisal approaches and methods to estimate the value of the taxpayer's property. This statement is true for analysts who work for tax assessment authorities and for analysts who work for property owners.

The three generally accepted property appraisal approaches are the income approach, the cost approach, and the market (or sales comparison) approach. Depending on the physical, functional, and economic attributes of the taxpayer's property, the property can be valued based on (1) the summation principle of property appraisal or (2) the unit principle of property appraisal.

Applying the summation valuation principle, each component of the property is valued separately. That is, each component of land, land improvements, buildings, and tangible personal property may be valued separately. Then, all of the individual component property values are "summed" to conclude the total value of the taxpayer's property.

In the application of the unit valuation principle, in contrast, a complex property may be valued collectively—in the aggregate—as a single "unit" of taxpayer property. That is, all components of the land, land improvements, buildings, and tangible personal property are valued as part of a total assemblage—or unit—of property.

This discussion focuses primarily on the unit principle of property appraisal. Analysts always consider—and frequently apply—the income approach in unit principle property appraisal. The generally accepted income approach property appraisal methods include the yield capitalization method (sometimes referred to as the discounted cash flow method) and the direct capitalization method.

All income approach appraisal methods typically include the application of either a yield capitalization rate (sometimes referred to as a discount rate) or a direct capitalization rate. Depending on the measure of income included in the unit principle appraisal, the corresponding discount rate or direct capitalization rate may be one of the following:

1. A weighted average cost of capital ("WACC")
2. A cost of equity capital ("K_e")
3. Some other opportunity cost or expected rate of return measurement

The measurement of the property-specific discount rate or capitalization rate is also relevant to the application of the cost approach and the market approach to property appraisal. The discount rate and capitalization rate may affect the measurement of economic obsolescence in the cost approach.

The relative discount rates and capitalization rates (between the subject property and the comparable properties) may affect the analyst's selection and application of market-derived valuation pricing multiples in the market approach.

When the K_e is one component of the appropriate discount rate or capitalization rate, there are several generally accepted models that the analyst may apply to measure the taxpayer unit K_e. Several of these models are summarized in this discussion.

One consideration of just about every K_e measurement model is a component related to investment-specific (or property-specific) risk. This property-specific risk component is called by many names in the valuation professional literature, including unsystematic risk, asymptomatic risk, nondiversifiable risk, nonsystematic risk, project-specific risk, residual risk, investment-specific risk, and company-specific risk.

In the valuation professional literature, this property-specific risk component is sometimes called alpha—or the remaining risk component that is not measured by the other K_e variables. Whatever name is applied to this risk component, it does relate to a nondiversifiable element of risk. This type of risk is one consideration in the analyst's selection of the discount rate or capitalization rate to be applied in the unit principle appraisal.

This discussion focuses on what is included in—or should be considered in—the analysis of this K_e alpha component (or property-specific risk component).

The Property Cost of Capital

The K_e is the expected rate of return that an equity investor expects on the capital invested in a particular investment. Equity investors expect to earn a certain return on investment in order to be attracted to that particular investment.

In economic terms, the K_e for a particular investment is the opportunity cost of capital. That is, the K_e is the opportunity cost to the investor—or the rate of return that the investor forgoes by not investing the same amount of funds in the next best alternative investment available at a comparable level of risk.

The K_e is a forward-looking expectation of investment return. The K_e is the rate of return that the investor expects to receive in the future on that investment.

The K_e incorporates the following expectations regarding the investment return:

- The "real" rate of return—The amount of return that an investor would expect to earn on a risk-free investment.
- The expected inflation rate—The anticipated depreciation in purchasing power while the investor's wealth is tied up in the particular investment (i.e., during the expected investment holding period).
- The risk-related return—The return component related to the uncertainty as to when and how much current period income—or capital appreciation—the investor will receive from the particular investment.

The K_e metric enables the investor to convert (or to discount) an estimate of expected future income to a present value. This present value procedure allows the investor to:

1. make informed pricing decisions with respect to the purchase or sale (whether real or hypothetical) of the subject property and
2. compare one investment opportunity to alternative investment opportunities.

There are several generally accepted K_e measurement models. Most of the K_e measurement models include the following components:

1. A risk-free rate of return ("R_f")
2. A general equity risk premium ("ERP")
3. An industry-related risk premium ("IRP")
4. A size-related risk premium ("S_p")
5. An unsystematic risk premium

This discussion generally refers to that unsystematic risk premium as the property-specific risk premium—or the "PSRP."

For the first four above-listed K_e components, there are generally accepted data sources that analysts can access to quantify that particular return component. For the fifth above-listed K_e component (i.e., the unsystematic risk premium), there is no single data source that analysts can access to specifically quantify that particular return component.

Of course, there is no data source available as a reference for the property-specific risk measurement. This is because, by definition, the property-specific risk is unique to the individual property.

There are numerous qualitative factors that analysts can consider, and there are several quantitative proxies that analysts can consider—to develop a supportable estimate for the fifth K_e component. Ultimately, the estimate of the unsystematic risk component of the private company K_e is a matter of the analyst's professional judgment.

For purposes of this discussion, the PSRP is referred to and explained in the context of the appraisal of the taxpayer's industrial or commercial property. That is, the consideration and estimation of a *property*-specific risk premium is discussed.

The S_p and the PSRP are sometimes referred to collectively as the "alpha" or "α" component of investment risk. Alpha is sometimes defined as the excess return on an investment above the rate of return that is predicted by the application of the capital asset pricing model ("CAPM").

The term alpha is often attributed to the academic research of Michael Jensen. Jensen taught finance at the University of Rochester between 1967 and 1988. During that time period, Jensen compared the rates of return actually earned on diversified investment portfolios to the rates of return that were predicted by the CAPM.

The formula for this comparison—or this measurement of what is often called "Jensen's alpha"—follows:

$$\alpha = R_i - [R_f + \beta \times (R_m - R_f)]$$

where:

α	=	Jensen's alpha
R_i	=	Actual rate of return on the investment
R_f	=	Risk-free rate of return
$(R_m - R_f)$	=	Long-term equity risk premium (measurement of the overall equity risk premium)
β	=	Industry beta

The investment portfolio's actual rate of return in excess of the CAPM-predicted rate of return may be positive, negative, or zero. The CAPM measures the risk-adjusted rates of return on investment securities (i.e., the CAPM accounts for the risk of the security). If the security is efficiently priced, then the actual return on investment will be same as the return on investment predicted by the CAPM.

The alpha in that case (i.e., the actual rate of return equals the expected rate of return) will be zero. If, however, the equity security actually earns a higher rate of return than the CAPM-predicted rate of return, then it will have a positive alpha. A negative alpha indicates that the portfolio actually did not earn its CAPM-predicted expected rate of return.

While capital markets are typically considered to be efficient (and, therefore, an alpha should theoretically not be observed in the actual application of the CAPM), Jensen noted that an alpha was actually observable—and measurable.

Cost of Equity Capital Measurement Models

Investors and finance professionals have developed numerous models for analyzing and measuring the K_e component of an investment in an industrial or commercial property.

These K_e measurement models include the following:

1. The dividend yield plus capital gain model (also called the discounted cash flow model or "DCF" model)
2. The arbitrage pricing theory (or "APT") model
3. The Fama-French multi-factor model
4. The CAPM
5. The modified capital asset pricing model (or "MCAPM")
6. The build-up model (or "BUM")
7. The Duff & Phelps risk premium report model (or "RPM")
8. The R_f plus risk premium model
9. The Gordon growth model
10. Many other models

The following discussion focuses on the application of the BUM, the CAPM, the MCAPM, and the RPM to measure the K_e for the purpose of appraising industrial or commercial property for property tax purposes.

This discussion of estimating the PSRP component applies to all of the above-listed K_e models. Due to space constraints, this discussion focuses primarily on the BUM, CAPM, MCAPM, and RPM. However, analysts should be aware that the PSRP (or unsystematic risk premium) is a consideration in just about every discount rate and capitalization rate measurement. And, the PSRP is a consideration in just about every unit principle property appraisal.

In each K_e measurement model, the R_f is the rate of return available on a security that the market generally regards as free from the risk of default. Additionally, the R_f serves as an inflation adjustment mechanism.[1]

Typically, analysts measure the R_f by reference to the 20-year U.S. Treasury bond. This is because the 20-year U.S. Treasury bond is often used as the empirical benchmark in the measurement of the general ERP.

In most K_e measurement models, the ERP is the incremental rate of return that the investor expects to receive as compensation for the risk of investing in equity investments (e.g., stocks) instead of investing in a risk-free asset. Conceptually, the ERP should be forward-looking. However, most data sources available to measure the ERP actually rely on historical market returns.

One proxy to measure the ERP for U.S. stocks is the Standard & Poor's ("S&P") 500 index. This index is based on the market capitalizations of 500 large companies with common stock listings on:

1. the New York Stock Exchange ("NYSE"),
2. the National Association of Securities Dealers Automated Quotations ("Nasdaq"), or
3. the CBOE BZX Exchange.

In many K_e measurement models, the ERP is typically calculated as follows:

$$ERP = R_m - R_f$$

where:

ERP = Equity risk premium
R_m = Expected rate of return on the stock market
R_f = Risk-free rate of return

Build-Up Model

The BUM is an additive model that incorporates the various risk factor components of the K_e, including (1) an R_f, (2) an ERP, (3) an IRP, (4) an S_p, and (5) a PSRP.

In the BUM, the K_e is typically calculated as follows:[2]

$$K_e = R_f + ERP + IRP + S_p + PSRP$$

where:

K_e = Cost of equity capital
R_f = Risk-free rate of return
ERP = Equity risk premium
IRP = Industry risk premium
S_p = Size-related risk premium
PSRP = Property-specific risk premium

Capital Asset Pricing Model

According to the textbook *Understanding Business Valuation*, the CAPM was "originally developed in the context of portfolio theory as a way to measure the risk an individual stock contributes to a well-diversified portfolio."[3]

Further, "CAPM has been modified to be used as a method of determining a discount rate, commonly used in the valuation of larger companies. It has little, if any, applicability to small- and medium-sized businesses. . . ."[4]

The basic CAPM formula does not include an alpha component. This is because the basic CAPM

is applicable to measure the expected rate of return of a perfectly liquid security within the context of a well-diversified portfolio of publicly traded (i.e., perfectly liquid) securities.

For that application, unsystematic risk can be diversified away. Accordingly, an investor who buys a perfectly liquid security within a well-diversified portfolio of publicly traded (i.e., perfectly liquid) securities would not expect to earn a PSRP.

In addition, the CAPM is based on a number of fundamental assumptions. Some of the fundamental assumptions underlying the development of—and the application of—the CAPM include the following:

- Financial markets are competitive and returns provide full range of investment opportunities.
- All investors plan to invest over the same time horizon.
- There are no distortionary income taxes or transaction costs.
- All investors can borrow and lend at the same risk-free rate.
- Investments are infinitely divisible.
- Investors can access all information and are equally well informed.
- The risk measure used remains constant (i.e., a nonvarying beta). That is, the market portfolio that is used to determine beta will consist of all publicly traded securities.
- The variance of returns is an adequate measurement of risk. That is, the CAPM assumes that investment rates of return will be normally distributed.

The above-listed fundamental assumptions of the CAPM typically do not apply in the typical industrial or commercial property appraisal. Further, the fundamental assumptions of the CAPM may not always apply when estimating the K_e of a single liquid security within well-diversified portfolio of publicly traded securities. Analysts know this because alpha is still able to be observed in the public capital markets.

The basic CAPM formula is presented below:[5]

$$K_e = R_f + \beta \times (R_m - R_f)$$

where:

K_e = Cost of equity capital
R_f = Risk-free rate of return
$(R_m - R_f)$ = Long-term equity risk premium (measurement of the overall equity risk premium)
β = Industry beta

Modified Capital Asset Pricing Model

The MCAPM measurement method expands the basic CAPM measurement method. The application of the MCAPM is appropriate for measuring the K_e that would be applicable to the taxpayer unit appraisal.

The MCAPM formula is presented below:[6]

$$K_e = R_f + \beta \times (R_m - R_f) + S_p + PSRP$$

where:

K_e = Cost of equity capital
R_f = Risk-free rate of return
$(R_m - R_f)$ = Long-term equity risk premium (measurement of the overall equity risk premium)
β = Industry beta
S_p = Size-related risk premium
PSRP = Property-specific risk premium (measurement of other risk factors)

Similar to the CAPM, in the application of the MCAPM, the long-term ERP is adjusted by an industry beta. Beta is a measure of the systematic risk (i.e., the systematic risk relative to the return measure of the overall equity market, such as the S&P 500 index) inherent in a company's investment return.

Published betas for publicly traded stocks typically reflect the capital structure of each respective public company. These betas are often referred to as levered betas, or betas that reflect the amount of the debt/equity leverage in the public company's capital structure.

Duff & Phelps Risk Premium Report Model

Duff & Phelps, LLC, annually publishes a measurement of the ERP based on the factors included in the "Risk Premium Report Study." The Risk Premium Report Study is primarily intended to be used in the development of K_e estimates for private companies:

1. that are financially healthy and
2. for which a "going-concern" premise of value is appropriate.

The Risk Premium Report Study develops its estimate of the ERP based on eight size factors.

The application of the Risk Premium Report Study to measure the K_e is often referred to as the RPM.

The RPM also includes data that may be used to estimate the ERP based on three risk factors. A detailed explanation of the size factors and the risk factors presented in the Risk Premium Report Study is beyond the scope of this discussion.

The RPM provides regression formulas that may be used to estimate the ERP, and the risk premiums are "smoothed" across 25 portfolios of different sized companies. To calculate the ERP, the analyst can apply the corresponding regression equation. Alternatively, analysts can select the portfolio that most closely resembles the size—or the risk characteristic fundamental—of the taxpayer unit.

Analysts rely on the subject investment (e.g., the subject property) operating fundamentals and the corresponding regression equation in order to estimate the ERP over the R_f for the investment. Analysts may include a PSRP component to the indicated ERP in order to measure the investment's K_e.

For example, let's assume that the analyst is valuing an illustrative taxpayer property (this example assumes a public utility property) as of June 2017. Let's assume that the subject property reports a historical five-year average net income of $0.7 million.

Applying the RPM regression formulas, the applicable regression equation variables are as follows:[7]

1. Constant of 14.722 percent
2. Coefficient of -2.565 percent

The calculation of the ERP over the R_f in this example is (1) 14.722 percent plus (2) -2.565 percent multiplied by (3) the common logarithm (or Log10) of $0.7 million. The resulting ERP over the R_f would equal 15.12 percent.

The RPM relies on an estimated ERP by Duff & Phelps in the calculation of the regression variables. Therefore, an ERP adjustment is needed. One frequently applied procedure for making this adjustment is to reconcile the difference between:

1. the ERP used in other K_e models (e.g., the MCAPM) and
2. the estimated ERP by Duff & Phelps used to calculate the regression variables.

Let's continue with the above example. Let's assume that:

1. the "ex post" ERP that the analyst relies on in the application of the MCAPM is equal to 6.94 percent and
2. the Duff & Phelps estimated ERP used in the regression variable calculation is 5.00 percent.

In this example, the RPM "ERP adjustment" would be 6.94 percent minus 5.00 percent, or 1.94 percent.

The estimated K_e in this example would be the (1) R_f (let's assume 2.60 percent) plus (2) the ERP of 15.12 percent plus (3) the ERP adjustment of 1.94 percent plus (4) the PSRP (let's assume 3 percent). Therefore, the estimated K_e would be 22.66 percent.

The MCAPM is one generally accepted model to measure the K_e for a unit principle valuation. In the application of the MCAPM, analysts should understand both the conceptual basis for—and the empirical data considered in the measurement of—the S_p and the PSRP (i.e., alpha).

To understand both the conceptual foundation and the empirical evidence for the development of the PSRP, it is important to understand the concepts of systematic risk and unsystematic risk.

Systematic Risk and Unsystematic Risk

In order to understand the importance of both the S_p and the PSRP in measuring the K_e for the appraisal of a subject property, it may be helpful to identify the differences between systematic risk and unsystematic risk.

According to the textbook *Valuing a Business*:[8]

> . . . *systematic risk* is the uncertainty of future returns resulting from the sensitivity of the return on the subject investment to movements in the return on the investment market as a whole. *Unsystematic risk* is a function of characteristics of the industry, the individual company, and the type of investment interest.

The basic CAPM assumes that the K_e risk premium component is a function of the investment's systematic risk only. One fundamental principle of the basic CAPM is that the investor expects a return on investment assuming that the investment is both (1) perfectly liquid and (2) part of a perfectly diversified portfolio of liquid investments.

In addition, another fundamental principle of the basic CAPM is that beta encompasses all the risk

inherent in the subject investment. Because unsystematic risk is associated with the characteristics of the individual investment, the CAPM does not incorporate an adjustment for PSRP.

However, MCAPM was developed as a method for measuring K_e for an investment that is either—or both—(1) not perfectly liquid and/or (2) not part of a perfectly diversified portfolio of liquid investments. In other words, MCAPM is applicable to the K_e measurement for the unit principle appraisal.

Unsystematic risk is incorporated in the MCAPM measurement of K_e by including the consideration of both S_p and PSRP (or, collectively, alpha).

Size-Related Risk Premium

In addition to the ERP, the MCAPM also incorporates consideration of an S_p (this S_p is sometimes also referred to as a small company risk premium). For a particular size of subject investment, the S_p represents the difference between (1) the actual historical excess return and (2) the excess return predicted by beta.

This "size effect" is based on the empirical observation that companies of smaller size are generally associated with greater investment risk and, therefore, have to provide a greater rate of return on investment in order to attract equity investors.

Property-Specific Risk Premium

The PSRP is the risk premium associated with the level of unsystematic risk inherent in a particular taxpayer unit. The PSRP can be positive or negative depending on the facts and circumstances of the taxpayer unit. The PSRP represents the additional risk premium required to compensate an equity investor for the uncertainty of investing in an industrial or commercial property.

Selection of a Property-Specific Risk Premium

In the professional literature related to investment analysis and portfolio management, "property-specific risk" is interchangeably referred to as "investment-specific risk," "company-specific risk," "nonsystematic risk," "unsystematic risk," "nondiversifiable risk," and "idiosyncratic risk."

This discussion sometimes uses the term "investment-specific risk." However, the term "property-specific risk" is frequently used in the valuation professional literature. Therefore, this discussion generally uses the term "property-specific risk."

Consideration of a Property-Specific Risk Premium

When estimating the discount rate or capitalization rate related to an investment, the PSRP is generally the last component applied when measuring the K_e. The PSRP is the component of risk that makes an investment (1) unique and (2) different from other benchmark investments that may be used to measure property capitalization rates, valuation pricing multiples, and/or other pricing metrics.

The inclusion of a PSRP in the K_e measurement is a generally accepted property appraisal procedure. However, a few issues make estimating a supportable level of property-specific risk difficult. The issues that can make the PSRP estimation difficult include risk (1) identification, (2) measurement, and (3) correlation with the appropriate incremental rate of return.

Because the PSRP is based on property-specific risk, there is no database, empirical study, measurement model, formula, or the like that can be applied to calculate a PSRP for an individual property investment. Therefore, while both qualitative analysis and quantitative empirical data proxies may be useful in the PSRP estimation, the PSRP measurement is ultimately a matter of the analyst's professional judgment.

In transactions involving industrial and commercial property, investors (or potential willing buyers) expect to be compensated for the assumption of property-specific risk. However, investors (or potential willing buyers) do not expect to be compensated for a PSRP in transactions where property-specific risk can be easily diversified away.

The CAPM was originally developed to estimate the K_e of a perfectly liquid security within well-diversified portfolio of perfectly liquid securities. Accordingly, the CAPM is less applicable for estimating the K_e of a nondiversified portfolio of illiquid investments.

With the development of the MCAPM, a CAPM-based model can be applied to estimate a discount rate or capitalization rate for purposes of a unit principle appraisal. This is because the MCAPM incorporates a component for the increased risk associated with property investment factors—factors that are not mitigated by perfect diversification and perfect liquidity.

For industrial and commercial property that lack the risk-mitigating influences of liquidity, diversification, and/or limited liability, company-specific risk cannot be diversified away. In contrast, the expected K_e of an investment that does possess the

risk and expected return attributes of diversification and liquidity is likely not influenced by a PSRP.

The PSRP is considered directly in the application of the income approach when analysts select a discount rate or capitalization rate for the appraisal of an industrial or commercial property.[9]

Further, the PSRP is considered indirectly in the application of the sales comparison (or market) approach and the cost approach in the appraisal of an industrial or commercial property.

The PSRP is considered directly in the income approach when analysts estimate the K_e for purposes of calculating (1) a cash-flow-based (enterprise) discount rate or capitalization rate or (2) a net-income-based (equity) discount rate or capitalization rate.

The PSRP is considered indirectly in the sales comparison approach when:

- selecting guideline publicly traded companies (i.e., for the stock and debt method) and guideline acquisition transactions (i.e., for the direct sales comparison method) and
- extracting subject-interest-specific pricing multiples from the selected guideline publicly traded companies or the guideline acquisition transactions.

The PSRP is considered indirectly in the cost approach when:

- measuring any intangible value in the nature of goodwill, particularly through the application of the capitalized excess earnings method ("CEEM") of intangible personal property appraisal or
- measuring any economic obsolescence in the cost approach appraisal of the taxpayer unit real estate and personal property, particularly through the application of the capitalization of income loss method ("CILM") of economic obsolescence measurement.

To a certain extent, the magnitude of the selected PSRP may be influenced by the valuation purpose.[10] For example, the selection of the PSRP may be influenced by the following considerations:

1. The statutory, regulatory, judicial, or other standard of value selected—or required—for the valuation assignment (e.g., fair market value, fair value, investment value).
2. The statutory, regulatory, judicial, or other level of value selected—or required for—the valuation assignment (e.g., controlling marketable, noncontrolling marketable, controlling nonmarketable, noncontrolling nonmarketable).
3. The statutory, regulatory, judicial, or other premise of value selected—or required for—the valuation assignment (e.g., value in continued use as a going concern, value in exchange as part of a disposition of assets).

Quantification of a Property-Specific Risk Premium

Analysts may rely on a qualitative analysis to estimate a supportable PSRP. The following discussion summarizes (1) the qualitative factors that analysts may consider and (2) the qualitative procedures that analysts may apply to those factors in order to estimate a PSRP.

Qualitative Factors

Three sets of qualitative factors that analysts may consider are presented below. For purposes of this discussion, these factors are categorized as follows:

1. The National Association of Certified Valuators and Analysts ("NACVA") factors
2. Taxpayer unit competitive analysis factors
3. Taxpayer unit functional analysis factors

A discussion of these three sets of qualitative factors is presented below.

NACVA Factors

In its various publications and educational materials, NACVA has recommended various factors that analysts may consider in the PSRP estimate. The factors may be grouped in the following six categories:

1. Competition
2. Financial strength
3. Management ability and depth
4. Profitability and stability of earnings
5. National economic effects
6. Local economic effects

NACVA indicates that analysts make individual quantitative and qualitative assessments within each of the first four categories of PSRP factors. In order to determine a PSRP, the analyst assigns a specific point value (ranging from 1 point for low risk to 10 points for high risk) to each factor. This point assignment is based on the analyst's

professional judgment with regard to the taxpayer unit operations.

The final two categories are economic factors that analysts assign points of minus one, plus one, or zero—based on a strong economy, weak economy, or neutral economy, respectively. These categories and factors are also scored based on the analyst's professional judgment.

Finally, analysts calculate the sum of (1) all of the point values in the first four categories (weighted by the number of individual factors in each category) and (2) all of the point values in the last two categories. This summation provides an indication for analysts to consider in the judgment-based PSRP estimate.

The NACVA analysis is considered a "numerical procedure." An example of a numerical procedure is presented later in this discussion.

Taxpayer Property Competitive Analysis Factors

The analyst's strategic assessment of the subject property's competitive position provides an analysis structure—based on a competitive advantage and strategy analysis—for estimating the PSRP. This competitive analysis aggregates the PSRP factors into three categories that consider the property's strengths, weaknesses, opportunities, and threats.

These categories of factors are presented as follows:

1. Macroenvironmental factors
2. Taxpayer industry factors
3. Taxpayer/property owner factors

The competitive analysis includes a subgroup of factors for analysts to consider within each of the three categories. This competitive analysis is based on an application of Michael Porter's "Five Forces" strategic planning and analysis model. In this procedure for analyzing the PSRP, a competitive analysis should be part of the analyst's judgment in estimating the PSRP.

The competitive analysis may be applied by considering any of the qualitative factor analysis procedures presented later in this discussion.

Taxpayer Property Functional Analysis Factors

A functional analysis considers the property employed, the functions performed, and the risks assumed with regard to the subject property. Such a functional analysis includes the analyst's consideration of various categories of individual quantitative and qualitative PSRP factors.

One of the functional analysis categories of PSRP considerations relates to the following property-related risk factors:

1. Economy risk
2. Operating risk
3. Asset risk
4. Market risk
5. Regulatory risk
6. Business risk
7. Financial risk
8. Product risk
9. Technological risk
10. Legal risk

Such a functional analysis further presents a category of PSRP considerations relating to the following property-related nonfinancial factors:

1. Economic conditions
2. Location of business
3. Depth of management
4. Barriers to entry into market
5. Industry conditions
6. Competition
7. Quality of management
8. The bottom line

The analyst's property-specific assessment of all these factors is relevant to the PSRP estimate. Moreover, like all of the PSRP factors considered, analysts rely on informed professional judgment when estimating the PSRP.

Documentation Procedures of a Qualitative Factor Analysis

Some analysts apply three procedures for (1) estimating a PSRP based on the qualitative analysis of the property-specific risk factors and (2) documenting the analyst's due diligence and ultimate estimate of the PSRP.

These three documentation procedures are sometimes called:

1. the plus/minus procedure,
2. the numerical procedure, and
3. the listing procedure.

All three of these procedures start with a listing of the relevant PSRP factors selected by the analyst.

These due diligence and analysis documentation procedures are discussed below.

The Plus/Minus Procedure

In the plus/minus (or +/-) documentation procedure, analysts indicate either a "+" notation or a "-" notation next to the test of each factor considered. The plus notation indicates that the factor increases the amount of the PSRP; the minus notation indicates that the factor decreases the amount of the PSRP. A blank notation indicates that the factor has a neutral impact on the amount of the PSRP.

Double or triple notations (e.g., ++ or ---) indicate that the individual factor has a particularly positive or a particularly negative impact on the quantum of the PSRP. Each plus/minus notation, however, does not necessarily represent one percentage point.

Ultimately, the quantum of the PSRP is based on the analyst's professional judgment. The PSRP estimate should not be considered as the mathematical summation of "plus" and "minus" indications.

The Numerical Procedure

Using the numerical documentation procedure, analysts assign a specific percentage number to each PSRP factor considered.

If the analyst assigns "2.0" to a particular factor, that indicates that the analyst adds two percentage points to the quantum of the PSRP factor. If the analyst assigns "(1.0)" to a particular factor, that means that the analyst subtracts one percentage point from the quantum of the PSRP. And, if the analyst assigns "0" to a particular factor, that factor has no impact on the quantum of the PSRP.

In contrast to the previously described "plus/minus" procedure, in the numerical procedure, the analyst's PSRP estimate is informed by the numerical summation of all of the individual values for each PSRP factor.

The Listing Procedure

Applying the listing documentation procedure, analysts list all of the negative—and all of the positive—property-specific risk factors. Analysts do not assign a numerical quantum to either the negative factors or the positive factors. And, analysts do not indicate the relative importance of any individual PSRP factor.

Applying the listing procedure, the analyst estimates the PSRP based on professional judgment.

Example of Qualitative Factor Analysis

Exhibit 1 illustrates the three above-mentioned PSRP documentation procedures as applied to a simplified taxpayer property appraisal. In this simplified example, the analyst identified the strategic, financial, and operational risk factors that most affect the taxpayer's property.

Based on a functional analysis, the analyst assessed each positive and each negative company-specific risk factor affecting the taxpayer property. In Exhibit 1, the analyst prepared three alternative

Exhibit 1
Taxpayer Company
Illustrative Taxpayer Property Appraisal
Documentation of the Analyst's PSRP Assessment
Example of Qualitative Factor Analysis

	Plus/Minus Documentation Procedure	Numerical Documentation Procedure	Listing Documentation Procedure
Analysis of Taxpayer Company Negative Risk Factors			
1. Operating History, Volatility of Revenue and Earnings	+ + +	3.0	X
2. Lack of Service Line Diversification	+ +	1.0	X
3. Obsolete Information Technology Systems	+	0.5	X
4. Key Employee Dependence	+ +	1.0	X
Analysis of Taxpayer Company Positive Risk Factors			
1. Long-Term Contracts with Established Customers	- -	-1.0	X
2. Ownership/License of Proprietary Patents, Copyrights, Trademarks, and Trade Secrets	-	-0.5	
Indicated Taxpayer Property PSRP (%)	4.0	4.0	4.0
Analyst's Estimated PSRP (%)			**4.0**

documentation procedures related to the property-specific risk due diligence and analysis.

Exhibit 1 illustrates the three alternative documentation formats or procedures (i.e., plus/minus, numerical, and listing) of the analyst-selected PSRP factors in this taxpayer unit appraisal. In this example, regardless of the due diligence documentation procedure selected, the analyst consistently estimated 4 percent as the PSRP.

In this simplified example, the analyst concludes that 4 percent is the most supportable PSRP estimate.

The next section of this discussion presents various quantitative analyses that analysts may consider as a proxy or benchmark or approximation in the PSRP estimate. These quantitative analyses are intended to be considered by analysts as a proxy or benchmark or approximation to provide general guidance in the PSRP estimate.

Proxies for the Property-Specific Risk Premium

The final PSRP estimate is supported by the analyst's professional judgment. Such professional judgment is based on consideration of:

1. the qualitative factors that may affect the property-specific risk of the taxpayer unit and
2. any market-derived empirical data that may provide a benchmark or approximation of a supportable PSRP.

There are various data sources that analysts may consider to provide guidance as a proxy or benchmark in the PSRP estimate. Unlike the data sources that analysts may consider to measure the S_p component of the K_e, these proxy data sources do not directly measure the PSRP.

Rather, these data sources may be considered by analysts to indirectly measure the PSRP. These data sources represent proxies for—or substitutes for—the PSRP estimate. They are not databases or formulas that provide specific empirical evidence to directly measure the PSRP.

Ultimately, the PSRP estimate is supported by the analyst's professional judgment and functional analysis of the subject property. The data sources described below provide an empirically based, quantitative test of the reasonableness of the analyst's PSRP estimate.

The following discussion summarizes four empirically based, quantitative proxy data sources that analysts may consider to provide guidance in the PSRP estimate. These proxy data source analyses are as follows:

1. Quantum of risk in the MCAPM and the BUM
2. Quartile analysis of Duff & Phelps/Ibbotson 10th size decile
3. Analysis of relative corporate bond ratings and yields
4. Analysis of illiquidity studies (i.e., pre-initial public offering and restricted stock studies)

Quantum of Risk in the MCAPM or BUM

Analysts may consider the different levels (or components) of risk within a K_e measurement model such as the MCAPM or BUM to provide indications of the PSRP estimate. That is, each component of the MCAPM (i.e., R_f, beta-adjusted ERP, and S_p) represent a quantifiable level—or quantum—of risk applicable to the taxpayer property unit.

These quantum of risk levels may be described as follows:

- The R_f is the rate of return that an investor would expect on an investment with no risk. Typically, the R_f sets the minimum rate of return that an investor will expect on any investment. The Rf measures the first quantum of risk in the Ke measurement model.
- The beta-adjusted ERP (in the MCAPM) or the combination of the ERP and the IRP (in the BUM) measure a second quantum of the expected rate of return on an investment in the taxpayer's property. That is, typically this second risk level is the quantum of expected return that motivates investors to forego the riskless investment.
- The S_p is the expected rate of return that an investor expects for investing in small-capitalized companies. For many reasons (in addition to size), small-capitalized companies tend to be riskier investments than large-capitalized companies. The S_p provides the third quantum of the risk levels related to the taxpayer's property.

The analyst now has to estimate the quantum for the fourth level of risk—the PSRP—associated with the taxpayer unit investment. Analysts have empirically based, quantifiable evidence for the first three quanta of risk associated with an investment

in the taxpayer property unit. Analysts can consider that empirically based, quantitative evidence in the PSRP estimate.

Presented in Exhibit 2 is a hypothetical K_e measurement. This K_e measurement considers the first three empirically based measurable quanta of risk levels in the estimation of the fourth judgment-based quantum of risk level (i.e., the PSRP).

The guideline quanta of risk levels presented in Exhibit 2 are based on illustrative data as of December 31, 2018. Specifically, (1) the R_f is based on the 20-year Treasury bond available as of December 31, 2018, (2) the ERP is the "ex post" ERP provided by the Duff & Phelps Cost of Capital Navigator, (3) the industry beta is based on hypothetical guideline publicly traded companies' betas as reported by Bloomberg, (4) the IRP is provided by the Duff & Phelps Cost of Capital Navigator for general contractors – nonresidential buildings (presented solely as an illustrative industry group), and (5) the S_p is provided by the Duff & Phelps Cost of Capital Navigator for size decile 10.

Based on the empirically based quantum of risk data for each of the first three levels of investment risk included in Exhibit 2, an analyst may conclude that 4 percent is a supportable PSRP estimate (i.e., the fourth quantum of risk of the K_e). That analyst conclusion is based on the consideration that the 4 percent PSRP estimate falls within the range of the other empirically based quantum of risk indications.

Exhibit 2
Illustrative PSRP Estimate
Guidance Based on a Proxy Risk Measurement
The Quantum of Risk Measurement Procedure

Application of the Modified Capital Asset Pricing Model (ex post equity risk premium):

Quanta of Risk in the Taxpayer Unit Cost of Equity Capital			Guideline Quantum of the Expected Rate of Return per Risk Level
Risk-Free Rate of Return		2.87%	3%
General Equity Risk Premium	6.91%		
Multiplied by: Industry Beta	0.90		
Industry-Adjusted Risk Premium		6.22%	6%
Size-Related Risk Premium		5.22%	5%
Analyst's Estimated Property-Specific Risk Premium - Based on an Assessment of the Previous Levels of Risk		4.00%	3% to 6%
Indicated Taxpayer Unit Cost of Equity Capital		18.31%	
Selected Cost of Equity Capital (rounded)		**18%**	

Application of the Build-Up Model:

Quanta of Risk in the Taxpayer Unit Cost of Equity Capital		Guideline Quantum of the Expected Rate of Return per Risk Level
Risk-Free Rate of Return	2.87%	3%
General Equity Risk Premium	6.91%	
Industry Equity Risk Premium	0.14%	
Industry-Adjusted Risk Premium	7.05%	7%
Size-Related Risk Premium	5.22%	5%
Analyst's Estimated Property-Specific Risk Premium - Based on an Assessment of the Previous Levels of Risk	4.00%	3% to 7%
Indicated Taxpayer Unit Cost of Equity Capital	19.14%	
Selected Cost of Equity Capital (rounded)	**19%**	

The average quantum of risk in the Exhibit 2 MCAPM K_e analysis (before consideration of the PSRP quantum of risk) is 4.8 percent. And, the average quantum of risk in the Exhibit 2 BUM K_e analysis (before consideration of the PSRP quantum of risk) is 5.0 percent. An analyst may consider the average size of the quantum of risk measured in each of the first three K_e model components in order to indicate a supportable quantum of the PSRP risk level.

The PSRP quantum of risk level estimate may not be constant over time. Like all components of the K_e, the PSRP is influenced by the prevailing economic conditions. Such prevailing economic conditions may upwardly or downwardly affect the various quanta of risk related to the various risk factors.

For example, if the R_f were to decrease from 2.9 percent in December 2018 to 1.9 percent in December 2019, it is likely that corresponding ERPs would decrease (all else being equal). If the expected return on a risk-free investment decreases, then the relative expected return needed to encourage an investor to forego the risk-free investment may also decrease.

The investor would not expect as much of a rate of return premium for investing in generally risky equity investments. This is because the alternative investment (i.e., a risk-free 20-year Treasury bond) now provides a lower rate of return. The quantum of a PSRP risk level indication based (at least in part) on the R_f and the general ERP components of the K_e may correspondingly decrease.

Quartile Analysis of the CRSP Deciles Size Premia Studies 10th Decile

The analyst may consider the University of Chicago Center for Research in Security Prices ("CRSP") Deciles Size Premia Studies 10th decile data (now presented in the Cost of Capital Navigator) to provide some empirical guidance as to a supportable PSRP estimate. While the CRSP Deciles Size Premia Studies data are typically relied on to quantify S_p, these data may also provide guidance with regard to a supportable PSRP range.

Background of the CRSP Deciles Size Premia Studies Data

The first comprehensive study of the size effect (i.e., the relationship of the size of a public company and the rate of return that investors expect on an investment in that company's stock) was performed by Rolf Banz in 1981. Banz examined and compared the returns of small-capitalized NYSE companies to the returns of large-capitalized NYSE companies. The study was performed over the time horizon of 1926 to 1975.

In this study, Banz segmented all NYSE publicly traded companies into 10 deciles—the 1st decile being the largest capitalized public companies and the 10th decile being the smallest capitalized public companies.

Banz concluded that there was an observable negative relationship between (1) the size of a public company and (2) the historical equity investment returns.[11]

That is, the Banz study concluded that as the public company size decreases, historical equity investment returns tend to increase—and vice versa. The so called "size effect," however, was not linear. Rather, the "size effect" was most pronounced in the smallest capitalized public companies.

Furthermore, as the investment holding period increased, the small-capitalized public companies tended to outperform the large-capitalized public companies—in terms of providing a higher rate of return to their investors.

Many of the risk attributes that generally define small-capitalized public companies provide possible explanations for this empirically based relationship between (1) company size and (2) equity return on investment.

In general, small-capitalized public company stocks are less liquid, harder to diversify, and tend to have less available investor information (due to limited security analyst coverage). Small-capitalized companies have fewer financial resources, operational resources, human resources, and strategic resources. These limited resources (compared to larger public companies) limit the smaller public company's ability to prevent larger companies from entering its market and taking its market share.

Due to having better access to capital, large-capitalized public companies tend to have greater ability (1) to hire better quality employees, (2) to spend more on advertising and on research and development, and (3) to endure economic downturns. Additionally, when compared to small public companies, large public companies have a relatively high volume of customers, decreasing their reliance on a few key customers.

The functional and operational differences listed above (this is not a comprehensive list) increase the risk associated with investing in a small public company compared with investing in a large public company. Therefore, investors expect smaller public companies to provide a higher return on equity

investment relative to larger public companies. This conclusion is because investors expect to be compensated for assuming the greater level of investment risk in a smaller public company—compared to the level of investment risk in a larger public company.

The S_p quantifies the increased rate of return that investors expect in order to compensate them for assuming the risk associated with small company investments.

A significant relationship between size of a company and historical equity returns was observed in the Banz study. However, the study concluded that it is not clear whether the relationship is due to company size itself—or to other unknown variables correlated with company size.

That is, small company size may not cause risk—or cause the increased expected investment returns. Rather, the financial and operational disadvantages associated with small company size may be causing the risk—and causing investors to expect higher rates of return on their equity investment.

This Banz study conclusion is summarized in the following statement:

> It is not known whether size [as measured by market capitalization] per se is responsible for the effect or whether size is just a proxy for one or more true unknown factors correlated with size.[12]

As a result of the Banz study, investment professionals began performing their own "size effect" studies. Applying the data reported by the CRSP, Roger Ibbotson and Rex Sinquefield performed a series of "size effect" studies that were published in the Morningstar/Ibbotson annual *Stocks, Bonds, Bills, and Inflation* ("SBBI") *Valuation Yearbook*. Those studies were called the CRSP Deciles Size Premia Studies, and they were summarized annually in the *SBBI Valuation Yearbook* from 1999 to 2016.

In 2016, Morningstar announced it would no longer publish the CRSP Deciles Size Premia Studies in the *SBBI Valuation Yearbook*. Starting with the 2016 edition, the annual study was prepared by Duff & Phelps, and it was published by John Wiley & Sons in the *U.S. Guide to Cost of Capital Valuation Handbook*.

The CRSP Deciles Size Premia Studies continue to segment the NYSE stock returns into deciles by size (as measured by the market capitalization of the publicly traded companies). Based on the NYSE decile breakpoints, the study now includes the entire universe of NYSE/NYSE MKT/Nasdaq-listed securities—rather than just the NYSE-listed securities. The CRSP deciles are now calculated from 1926 to the present year.

The CRSP deciles data include all publicly traded companies. That is, the CRSP Deciles Size Premia Studies data do not exclude financial services companies (companies in finance, insurance, or real estate) or high-financial-risk companies.

Duff & Phelps calculates the CRSP deciles size premiums as follows:

> Size premia represent the difference between historical (observed) excess return and the excess return predicted by the capital asset pricing model (CAPM). . . .
>
> Excess returns are defined here as portfolio returns over and above the risk-free asset's returns.[13]

In this study, the CAPM-predicted return is calculated as the product of (1) the beta ("β") for the subject portfolio (i.e., the subject decile) of public stocks and (2) the expected return on the market portfolio of stocks in excess of the R_f times the ERP. The observed difference after the β adjustment demonstrates that the β of smaller companies does not fully explain the perceived risk associated with smaller companies.

Therefore, the actual rate of equity return offered by smaller companies is not fully explained by the unadjusted CAPM alone. In other words, the β of small companies is underestimated. Accordingly, the unadjusted CAPM underestimates the K_e of smaller companies.

Empirical evidence indicates that the unadjusted CAPM as a measure for the expected returns for smaller companies is imperfect. As a result, it is a generally accepted procedure for analysts to consider a S_p in the K_e calculation.

This S_p consideration is especially relevant for so-called "microcap" companies (i.e., the public companies with equity capitalization in the 9th and 10th deciles), where the S_p is more pronounced. The CRSP deciles size premium data can be used in the application of the MCAPM and of the BUM to estimate a K_e for a smaller size property ownership interest.

The CRSP Deciles Size Premia Studies provides the size premium data and other valuation data previously published in (1) the *SBBI Valuation Yearbook* and (2) the Duff & Phelps *Valuation Handbook – U.S. Guide to Cost of Capital*.

All size premiums provided by Duff & Phelps are "beta-adjusted." This means that the size premiums are adjusted to remove the portion of the excess

return (above the unadjusted CAPM estimate) that is attributable to beta alone. That is, the concluded size premium data by Duff & Phelps measure only the contribution of the size effect to the excess return (above the unadjusted CAPM estimate).

In the application of the MCAPM and the BUM, analysts often apply the CRSP data to estimate the specific S_p for a subject ownership interest. In consideration of a supportable S_p, analysts may (1) first estimate the subject equity value by applying the market approach or the asset-based approach and then (2) second select the applicable Duff & Phelps decile and S_p indication.

When applying the S_p and the IRP provided by Duff & Phelps, adding both an S_p and an IRP to the BUM analysis is not considered to be "double-counting" these risk premiums. This is because (1) the Sp is "beta-adjusted" and (2) the IRP is the measurement of the beta risk. In other words, these two different risk premiums were designed to account for two different types of risk.[14]

Considering the CRSP Deciles Size Premia Studies Data as a Proxy for PSRP

Analysts may consider an analysis of the CRSP Deciles Size Premia Studies 10th decile as an empirically based proxy (or benchmark) in the PSRP estimation. The 10th decile is comprised of the smallest-capitalized public companies included in the CRSP Deciles Size Premia Studies.

The public companies that comprise the 10th decile may be disaggregated into subcategories 10a and 10b, as presented below.

The public companies that comprise the 10a subdecile include companies with market capitalizations between $185.4 million and $321.6 million, and the reported size premium is 3.71 percent (as of December 31, 2018).

The public companies that comprise the 10b subdecile include companies with market capitalizations between $2.5 million and $184.8 million, and the reported size premium is 8.25 percent (as of December 31, 2018).

Within each of the 10a subdecile and 10b subdecile categories of the 10th decile, Duff & Phelps presents two additional subcategories. The 10a subdecile may be disaggregated into 10w and 10x subdeciles, while the subdecile 10b may be disaggregated into 10y and 10z subdeciles.

Companies that are classified in the 10th decile vary considerably in market capitalization and in the applicable S_p. The empirically derived S_p measurements range from 2.89 percent to 11.14 percent, a spread of 8.25 percent, or 825 basis points.

Exhibit 3 presents an analysis of the CRSP Deciles Size Premia Studies data for the 10th decile. The Exhibit 3 empirical data were sourced from the Duff & Phelps Cost of Capital Navigator as of December 31, 2018. These empirical data present the disaggregation of the 10th decile, as of that date.

The 10th decile disaggregation presented in Exhibit 3 provides an indication that investment risk may be related to more than just the S_p examined in the Duff & Phelps and Ibbotson data. For example, subdecile 10y and subdecile 10z are populated by many large (but highly leveraged) public companies with small equity capitalizations. Such large (in terms of revenue and/or assets) public companies with small equity capitalization probably do not match the characteristics of financially healthy but smaller public companies.

As presented in Exhibit 3, as the size of public companies increases, the corresponding S_p decreases. That is why it is important for analysts to correctly interpret and apply the S_p expected return component of the MCAPM (and BUM) measurement of the K_e.

According to Duff & Phelps, "as of December 31, 2018, the reported size premium for the smallest 5 percent of companies by market capitalization as represented by CRSP subdecile 10b is 8.25 percent, and the size premium for the next smallest 5 percent of companies (as represented by CRSP subdecile 10a) is 3.71 percent, a difference of 4.54 percent."[15]

Further, according to Duff & Phelps, "The CRSP Deciles Size Premia include all companies with no

Exhibit 3
CRSP Deciles Size Premia Studies Data
Analysis of the 10th Decile
As of December 31, 2018

Disaggregation of the CRSP 10th Decile	Market Capitalization of the Smallest Public Company ($million)	Market Capitalization of the Largest Public Company ($million)	S_p – Size Premium (Actual Return in Excess of the Return Predicted by CAPM)
10a	185.418	321.578	3.71%
10w	250.270	321.578	2.89%
10x	185.418	250.248	4.68%
10b	2.455	184.785	8.25%
10y	109.462	184.785	6.85%
10z	2.455	109.406	11.14%

exclusion of speculative (e.g., start-up) or distressed companies whose market capitalization may be small because they are speculative or distressed."[16]

The distressed company issue may be considered through an analysis of the 10th decile subcategories of 10y and 10z, as presented in Exhibit 4 and Exhibit 5.

As presented in Exhibit 4, the subdecile 10y public companies report five-year net income ranging from negative $44.5 million to a positive $14.7 million. The subdecile 10y public companies are significantly smaller than other public companies in the CRSP Deciles Size Premia Studies. In addition, more than half of these subdecile 10y companies are unprofitable.

As presented in Exhibit 5, subdecile 10z includes public companies in the 5th percentile that report five-year average earnings before interest, taxes, depreciation, and amortization ("EBITDA") of negative $19.3 million. The public companies classified in subdecile 10z at or below the 50th percentile (i.e., the lower quartile) reported negative EBITDA.

Collectively, the data in Exhibit 4 and Exhibit 5 support the conclusion that the CRSP Deciles Size Premia Studies 10th decile is comprised of financially troubled and financially distressed companies.

Moreover, Duff & Phelps presents the following conclusion with regard to subdecile 10y and subdecile 10z:[17]

> Subdecile 10y and subdecile 10z are populated by many large (but highly leveraged) companies with small market capitalizations that probably do not match the characteristics of financially healthy but small companies (see "Total Assets," 95th percentile measures).

According to James Hitchner, writing in *Financial Valuation and Litigation Expert*, "It's important to note that 80 percent of the companies in decile category 10b are from 10z. As such, let's focus on 10z. At the 50th percentile of 10z the operating margin is -1.11 percent. Yes, on average, these companies are losing money. At the 25th percentile the operating margin is -21.27 percent. Furthermore, 62 percent of the companies in 10z are from only three industry sectors: financial services, technology, and healthcare."[18]

That is, analysts may consider the S_p data associated with CRSP size categories 10w, 10x, 10y, and 10z to provide guidance for the PSRP estimate for the taxpayer unit. These data are presented in the far right column of Exhibit 3 (as of December 31, 2018).

In particular, analysts may consider (1) the difference between the 10x and the 10w size premiums (e.g., 4.68 percent and 2.89 percent, respectively) and (2) the difference between the 10z and the 10y size premiums (e.g., 11.14 percent and 6.85 percent, respectively).

These differences in the size premiums (of approximately 2 percent to 4 percent) may provide an empirically based proxy or benchmark for the PSRP estimate.

Such consideration of the CRSP Deciles Size Premia Studies 10th decile may provide a reasonableness test for the analyst's judgment-based PSRP estimate with regard to the particular unsystematic risk profile of the taxpayer unit.

As indicated by Hitchner, based on dated information that is still relevant, not only does the CRSP Deciles Size Premia Studies 10th decile include financially troubled companies, it is also skewed by its industry concentration.

As presented above, the actual returns earned in excess of the returns predicted by the CAPM were 6.85 percent for subdecile 10y and 11.14 percent for subdecile 10z (or a difference of 429 basis points) as of December 31, 2018. This 4.29 percent return premium difference may (in part or in whole) be an indication of the quantum of return that is correlated with various types of financial and operational risk—and not just with the size of the taxpayer unit.

The delta between (1) subdecile 10y and subdecile 10z or (2) subdecile 10a and subdecile 10b may provide an indication for the investment return premiums related to the types of risks that are more often associated with the PSRP than with the S_p.

Analysis of Relative Bond Ratings and Bond Yields

The lack of diversification of the business operations of many taxpayer property units suggests that the relevant risk measure for investors may be "total risk." Total risk includes unsystematic risk (i.e., the total risk associated with an investment in any ownership interest includes property-specific risk).

For an undiversified equity investment in a taxpayer unit, some form of unsystematic risk likely exists—and should be considered when measuring the K_e.

However, quantifying the property-specific risk is a challenging process. In part, this is because most of the data typically considered to measure the

Exhibit 4
CRSP Deciles Size Premia Studies Data
Analysis of the 10y Subdecile
As of September 30, 2018

CRSP Decile 10y Percentiles	Market Value of Equity ($MM)	Book Value of Equity ($MM)	5-Year Average Net Income ($MM)	Market Value of Invested Capital ($MM)	Total Assets ($MM)	5-Year Average EBITDA ($MM)	Revenue ($MM)	Return on Book Value of Equity (%)
95th Percentile	180.567	206.050	14.660	596.811	1,480.151	90.734	936.174	34.2
75th Percentile	164.136	120.009	6.538	222.403	794.153	18.455	159.984	8.0
50th Percentile	145.135	73.664	(2.419)	177.823	163.197	-	49.969	(0.4)
25th Percentile	124.566	32.859	(19.152)	142.236	65.786	(12.043)	21.920	(54.7)
5th Percentile	109.977	0.014	(44.510)	115.058	23.418	(27.018)	0.480	(144.8)

EBITDA = Earnings before interest, taxes, depreciation, and amortization
Note: The data presented above are sourced as of September, but Duff & Phelps relies on these data for its size decile data as of December.
Source: Duff & Phelps 2019 Cost of Capital: Annual U.S. Guidance and Examples, Cost of Capital Navigator.

Exhibit 5
CRSP Deciles Size Premia Studies Data
Analysis of the 10z Subdecile
As of September 30, 2018

CRSP Decile 10z Percentiles	Market Value of Equity ($MM)	Book Value of Equity ($MM)	5-Year Average Net Income ($MM)	Market Value of Invested Capital ($MM)	Total Assets ($MM)	5-Year Average EBITDA ($MM)	Revenue ($MM)	Return on Book Value of Equity (%)
95th Percentile	94.613	115.874	5.684	225.088	668.823	23.478	336.341	22.6
75th Percentile	68.696	48.302	0.515	92.630	114.147	3.654	67.537	3.3
50th Percentile	41.957	21.530	(4.484)	56.026	42.808	(1.188)	20.507	(14.1)
25th Percentile	19.913	8.221	(13.786)	25.737	17.667	(8.672)	2.466	(89.7)
5th Percentile	8.086	(0.573)	(25.807)	9.623	5.589	(19.331)	-	(181.1)

EBITDA = Earnings before interest, taxes, depreciation, and amortization
Note: The data presented above are sourced as of September, but Duff & Phelps relies on these data for its size decile data as of December.
Source: Duff & Phelps 2019 Cost of Capital: Annual U.S. Guidance and Examples, Cost of Capital Navigator.

K_e are based on public company information—and public companies tend to be well diversified. Such diversification tends to reduce or eliminate the property-specific risk component of the K_e.

Another procedure that analysts may consider as an empirically based proxy (or benchmark) to provide guidance in the PSRP estimate is an analysis of the high-yield bond spread. A high-yield bond is a bond with a credit rating below investment-grade corporate bonds.

High-yield bonds pay a higher yield than investment-grade bonds. This high yield is typically (1) because of some high-risk factors or (2) because the issuing debtor company is financially distressed.

The yield on a typical corporate bond is comprised of the following components:

1. Real rate of return and a return premium for expected inflation. These two rate of return components are included in a government bond yield, also known as the risk-free rate—or the R_f.
2. Default risk premium. The default risk premium is measured as the required rate of return in the market in order to compensate investors for the risk of default on a corporate bond. Typically, the default risk premium is measured as the spread between (a) the yields on risky corporate bonds and (b) the yield on a U.S. Treasury bond (the yield that is also known as the R_f).

The risk of default is one component of investment risk that is likely to be minimized (or diversified away) in a diversified portfolio of debt investments. For example, let's assume an investor's portfolio is made up of a well-diversified portfolio of, say, 100 different corporate bond holdings. The risk that a default of one—or a few—of those debt instrument investments having a significant negative impact on the investor's portfolio return will be low.

The default risk premium in a high-yield bond is significantly higher than the default risk premium for an investment-grade bond. Such a default risk premium reflects the additional risk of a high-yield bond holder being unable to realize the expected cash flow from the issuing debtor company. In this way, the risk profile of the high-yield debt investor in a distressed debtor company is similar to the risk profile of an equity investor in a nondistressed company.

Because a high-yield bond is a bond with a credit rating below an investment-grade corporate bond, a high-yield bond typically pays a higher yield than an investment-grade bond. Of course, investors expect this higher yield because of the high-risk factors associated with the debtor company. The level of risk between the observed investment-grade corporate bonds and the high-yield "junk bonds" may provide a proxy to assist the analyst in the PSRP estimate.

As presented in Exhibit 6, the yields on various forms of bonds (and bond indices) vary based on the subject bond—or the subject bond index—risk profile.

The first debt security presented in Exhibit 6 is a six-month Treasury bill. Treasury bills (or T-bills) are sold with maturities ranging from a few days to 52 weeks. T-bills are typically sold at a price discount from the stated par amount (the par amount of a T-bill is also called the face value).

Rarely, T-bills have sold at a price equal to the par amount. Such a sale effectively results in a 0 percent yield to the investor. When a T-bill matures, the security holder is paid the par amount. If the T-bill's par amount is greater than the T-bill's purchase price, then the difference is the interest (or the yield) earned by the investor.

The next debt security presented in Exhibit 6 is a 10-year Treasury note. Treasury notes (or T-notes) earn a fixed rate of interest every six months until maturity. T-notes are issued with typical maturities of 2 years to 10 years.

In addition, the U.S. Treasury also issues Treasury bonds. Treasury bonds (or T-bonds) pay a fixed rate of interest every six months until they mature. Treasury bonds are issued with typical maturities of 20 years or 30 years.

All T-bills, T-notes, and T-bonds are issued by the U.S. Department of Treasury and are typically considered to be risk-free securities. As mentioned earlier, for technical data consistency purposes, the 20-year T-bond is typically used as the R_f when the analyst measures the K_e.

Exhibit 6
Bonds and Bond Index Yields
As of December 31, 2018

6-Month U.S. Treasury Bill	2.5%
10-Year U.S. Treasury Note	2.7%
Moody's Aaa Corporate Bond Index	4.0%
Moody's Aa Corporate Bond Index	4.2%
Moody's A Corporate Bond Index	4.3%
Moody's Baa Corporate Bond Index	5.1%
ICE BofAML BB U.S. High Yield Index	6.3%
ICE BofAML B U.S. High Yield Index	8.4%
ICE BofAML CCC & Below U.S. High Yield Index	13.7%

Source: Bloomberg and ICE BofAML.

The next tranche of debt securities presented in Exhibit 6 is the long-term corporate bond indexes for Aaa-, Aa-, A-, and Baa-rated corporate bonds, as rated by Moody's. Moody's is an internationally recognized credit rating agency. These rating categories for corporate and institutional bonds (i.e., Aaa through Baa) are typically referred to as "investment grade."

According to Moody's, "long-term obligation ratings are opinions of the relative credit risk of fixed-income obligations with an original maturity of one year or more. They address the possibility that a financial obligation will not be honored as promised. Such ratings reflect both the likelihood of default and any financial loss suffered in the event of default."[19]

Aaa-rated corporate debt obligations are considered to be of the highest quality with minimal risk. Aa-rated corporate debt obligations are considered to be of high quality and are subject to very low credit risk. A-rated corporate debt obligations are considered to be upper-medium-grade and are subject to low credit risk. Baa-rated corporate debt obligations are subject to moderate credit risk. Baa-rated corporate bonds are considered medium-grade and, as such, these bonds may possess speculative characteristics.

As presented in Exhibit 6, the highest-rated corporate bond index yield equals 4.0 percent, or 130 basis points above the 10-year T-note yield of 2.7 percent. That is, the incremental level of return required to attract a debt investor away from a risk-free investment to a risky (albeit low risk) investment is about 1.3 percent.

The third tranche of the debt securities presented in Exhibit 6 is considered to be high-yield or "below investment grade." Such debt instruments are market-capitalization-weighted indices of domestic corporate high-yield bonds. The indices track the performance of high-yield debt securities traded in the U.S. bond market.

The high-yield debt securities are considered to be below investment-grade rating (based on an average rating of the Moody's, S&P, and Fitch credit rating agencies). The debt securities included in these indices have at least 18 months to final maturity at the time of issuance, have at least a one year remaining term to final maturity as of the rebalancing date, have a fixed coupon schedule, and have a minimum amount outstanding of $250 million.

As presented in Exhibit 6, the lowest rated high-yield bond index yield as of the observation date equals 13.7 percent, which is (1) 530 basis points above the B-rated index yield of 8.4 percent and (2) 860 basis points above the lowest investment-grade index yield of 5.1 percent.

The lowest rated bonds (i.e., CCC and below) are typically referred to as "junk" bonds. Junk bonds have a high risk of default. And, like the companies that comprise the Duff & Phelps subdecile 10y and subdecile 10z (discussed above), the debtor companies that issue such junk bonds are often financially distressed.

The difference in the level of return on junk bonds and on other "below-investment-grade" bonds may provide guidance to the analyst as a proxy or benchmark for the PSRP estimate.

That is, the incremental return between a junk bond index (13.7 percent from Exhibit 6) and the B-rated bond index (8.4 percent from Exhibit 6) may provide an indication of the incremental return that debt investors expect as compensation for the factors that pertain to property-specific risk—such as financial distress, liquidity risk, and so forth.

The analyst may consider the yield differentials presented in Exhibit 6 as one source of empirically based evidence to indicate a supportable PSRP estimate. In particular, the analyst may consider the difference between:

1. the B-rated high yield investments (i.e., 8.4 percent on the observation date) and
2. the CCC and below-rated high-yield investments (i.e., 13.7 percent on the observation date).

This differential in high-yield bond returns—of approximately 5 percent—may provide analysts with an empirically based reasonableness test for a judgment-based PSRP estimate.

While this analysis of high-yield debt instruments does not directly measure the PSRP, it may provide analysts with a proxy of empirically based data that provide guidance for the PSRP estimate.

Analysis of Illiquidity Studies (Pre-IPO and Restricted Stock Studies)

While typically used to estimate a valuation discount for lack of marketability ("DLOM"), these studies may also provide a proxy—or benchmark—for a reasonableness test of the analyst's judgment-based PSRP estimate.

Relevant illiquidity studies that may provide an empirically based proxy for the analyst's PSRP estimate include the following: (1) pre-initial public offering ("IPO") studies such as the Emory Studies and the Valuation Advisor Studies and (2) a variety of restricted stock studies.

The variety of so-called restricted stock studies all observe the market prices of public company restricted stock sales and include such actual transactional data dating back to the late 1960s. These restricted stock studies indicate an average price discount (compared to the trading price of the same public company stock without the trading restriction) for public company restricted stock of:

1. approximately 35 percent for transactions occurring in the 1968 to 1988 period and
2. approximately 20 percent to 25 percent for transactions occurring after 1990.

The decrease in the observed price discounts is typically explained by the more recent shortened investment holding period for restricted stocks under Securities and Exchange Commission Rule 144.

The analyst may consider the DLOM measurements indicated by the restricted stock studies as a proxy to assess the reasonableness of a judgment-based PSRP estimate. As a simplified illustrative example, let's assume that the analyst selects a 20 percent DLOM with regard to the valuation of the taxpayer unit. This DLOM recognizes that the taxpayer's operating property is not as liquid as the stock of publicly traded companies.

Exhibit 7
Discount for Lack of Marketability Empirical Data As a Proxy Data Source to Assess the Reasonableness of the PSRP Estimate Based on a Restricted Stock Studies Analysis

MCAPM or BUM K_e Measurement:	
Risk-Free Rate of Return	2.9%
Industry-Adjusted General Risk Premium	6.9%
Size-Related Risk Premium	3.4%
Pre-PSRP Indicated Taxpayer Unit Cost of Equity Capital	13.2%
Analyst-Estimated PSRP	3.0%
Selected Risk-Adjusted Taxpayer Unit Cost of Equity Capital	16.2%
Reasonableness Test of the Analyst's PSRP Estimate:	
Pre-PSRP Indicated Taxpayer Unit Cost of Equity Capital	13.2%
Divided by: (One minus the 20% DLOM Percentage)	80.0%
Equals: Indicated Taxpayer Unit Risk-Adjusted Cost of Equity Capital	16.5%

The analyst may test the reasonableness of the judgment-based PSRP estimate by reference to this DLOM proxy. Exhibit 7 presents an illustrative example of such a PSRP estimate reasonableness test.

The pre-PSRP indicated K_e presented in Exhibit 7 illustrates a hypothetical MCAPM or BUM measurement of the subject taxpayer K_e—before consideration of the PSRP. The analyst considers the DLOM valuation adjustment to the pre-PSRP indicated K_e that may be supportable for a public company. Adjusting the pre-PSRP indicated K_e by the selected DLOM results in a risk-adjusted K_e after consideration of the PSRP that may be more supportable for a taxpayer's property unit.

The 3.3 percent delta between the pre-PSRP indicated K_e (of 13.2 percent) and the risk-adjusted K_e (of 16.5 percent) provides an indication of the illiquidity component of the property-specific risk (expressed as a DLOM) in the K_e.

That is, all else being equal, the difference between the K_e of a public company and the K_e of a subject property (in this illustration, the 3.3 percent delta) may be explained as consideration of illiquidity issues that operating properties experience (and that public company securities do not experience).

This consideration of these illiquidity issues may not capture the total quantum of the PSRP for a property unit. However, this consideration of the DLOM may provide the analyst with an empirically based proxy for the reasonableness test of a judgment-based PSRP estimate.

The Property-Specific Risk Premium and a Functional Analysis

Typically, in the process of identifying and estimating any PSRP component of a K_e, analysts perform a functional analysis of the subject property unit. This functional analysis is discussed next.

Description of a Functional Analysis

A functional analysis is one component of the PSRP identification and estimation process.

A functional analysis is often applied for purposes of assessing the comparability of the taxpayer's property unit to selected guideline or benchmark entities. These selected guideline or benchmark entities are typically considered to be comparable (or guideline) companies.

The development of a functional analysis is relevant in that context.

As will be described, the regulations related to Internal Revenue Code Section 482 explain the application of a functional analysis for purposes of determining reliability. And, the Organisation for Economic Cooperation and Development ("OECD") regulations describe the application of a functional analysis within the context of an intercompany transfer of tangible property, intangible property, or services between two OECD countries.

A functional analysis is certainly relevant to such an intercompany transfer price determination made for purposes of Section 482 compliance (or of OECD regulations compliance). In addition to applicability to a transfer price analysis, a functional analysis is also relevant within the context of a discount rate or capitalization rate development as part of unit principle valuation.

Many observers initially think of a functional analysis within the context of an intercompany transfer price determination between the controlled entities of a taxpayer (often a multinational taxpayer) for Section 482 (or for OECD) compliance purposes. While there are broader applications of a functional analysis, the Section 482 (and the corresponding OECD) regulations do provide a definition of a functional analysis that is generally applicable for this discount rate and capitalization rate development discussion.

Regulation 1.482-1(d)(3)(i) relates to comparability issues with regard to the allocation of income and deductions among taxpayers. Specifically, this regulation section deals with the factors for determining comparability of transactions and companies. This regulation section describes a functional analysis as follows:

> (i) Functional analysis. Determining the degree of comparability between controlled and uncontrolled transactions requires a comparison of the functions performed, and associated resources employed, by the taxpayers in each transaction. This comparison is based on a functional analysis that identifies and compares the economically significant activities undertaken, or to be undertaken, by the taxpayers in both controlled and uncontrolled transactions. A functional analysis should also include consideration of the resources that are employed, or to be employed, in conjunction with the activities undertaken, including consideration of the type of assets used, such as plant and equipment, or the use of valuable intangibles. A functional analysis is not a pricing method and does not itself determine the arm's length result for the controlled transaction under review. Functions that may need to be accounted for in determining the comparability of two transactions include –
>
> (A) Research and development;
>
> (B) Product design and engineering;
>
> (C) Manufacturing, production, and process engineering;
>
> (D) Product fabrication, extraction, and assembly;
>
> (E) Purchasing and materials management;
>
> (F) Marketing and distribution functions, including inventory management, warranty administration, and advertising activities;
>
> (G) Transportation and warehousing; and
>
> (H) Managerial, legal, accounting and finance, credit and collection, training and personal management services.

While this regulation section lists eight functions, it does not imply that the eight-item list is exhaustive. Rather, the regulation section indicates that the factors to consider "include" the eight listed functions. In addition, the regulation does not imply that the eight listed factors cannot be disaggregated or rearranged.

Within the context of estimating the PSRP cost of capital component for a property unit, a functional analysis may consider the following risk and expected return topics:

- What products and services are offered to customers or clients (and how are those products and services designed or developed)
- What is the source of supply of the materials, labor, and overhead that is needed to produce those products and services (including sourcing dependence and sourcing logistics issues)
- How the products and services are manufactured or otherwise produced
- How the products and services are differentiated, promoted, priced, and sold (including advertising and branding issues)
- How the inventory of products and services (including raw materials, work in process, and finished goods/services) are created, packaged, and stored
- How the products and services are delivered (including shipping, transportation, and other delivery logistics issues)

- What assets are utilized to perform the functions within the taxpayer's property unit (including working capital assets, tangible property, and intangible property)
- How profits are earned in the property (including the cost/volume/profit relationships with regard to both (1) production/service creation cost of sales and (2) production/service delivery revenue recognition)
- How the accounting, finance, human resources, management information, marketing, sales, and other administrative activities operate within the property unit
- How the taxpayer's property unit is organized, managed, and capitalized (legally and administratively), including both (1) the relationship between the taxpayer owners and the taxpayer operators/managers and (2) the relationship between the taxpayer and its sources of capital

There are various financial, competitive, and operational analyses that are components of the functional analysis.

Components of the Functional Analysis

Exhibit 8 present a listing of the typical considerations in the analyst's development of a functional analysis. Exhibit 8 serves as a checklist of considerations for any analyst who is considering the PSRP component of a discount rate or direct capitalization rate for a unit principle appraisal.

The functional analysis considerations listed in Exhibit 8 may be used to develop an understanding of the property unit. Analysts may apply this understanding in the estimation of—and the documentation of—the PSRP component of the discount rate or direct capitalization rate.

Risk Considerations in a Functional Analysis

One reason to conduct a functional analysis is to allow the analyst to identify the risks that are being assumed by the subject property unit. A significant portion of the return earned by the taxpayer's operations is due to the risks assumed by the taxpayer's property unit.

The functional analysis allows analysts to compare these risks (1) within the property unit; (2) between the property unit and the selected comparable (guideline) companies, transactions, and licenses; and (3) between related party (or associated) entities in a controlled transaction.

The analyst applies these risk considerations in the estimation of—and the documentation of—the PSRP component of the discount rate and the direct capitalization rate.

The 12 Steps of the Functional Analysis

In the PSRP estimate, analysts typically group all of the above-listed functional analysis considerations into 12 steps—or categories of analyst procedures and investigations. Analysts perform these 12 steps in the estimate of—and the documentation of—the PSRP component of the discount rate or the direct capitalization rate.

These 12 steps—or categories or groupings of analyst procedures—are listed in Exhibit 9.

The first 10 steps in Exhibit 9 primarily relate to the functions performed at the private company. Step 11 in Exhibit 9 primarily relates to the assets employed at the taxpayer's property unit. And, step 12 in Exhibit 9 primarily relates to the risks assumed by the taxpayer's property unit.

Application of the Functional Analysis to Measure the Property-Specific Risk Premium

Based on the discussion above, analysts consider the functional analysis procedures presented in Exhibit 9. Considering these functional analysis procedures, the analyst considers this functional analysis when estimating the PSRP component of the discount rate and the direct capitalization rate.

Summary and Conclusion

Analysts are often asked to appraise the taxpayer's industrial or commercial property for property tax compliance, appeal, or litigation purposes. Depending on the attributes of the taxpayer's industrial or commercial property, the analyst may apply summation principle property appraisal approaches or unit principle property appraisal approaches.

If the unit valuation principle is applicable to the property, the analyst will apply generally accepted property appraisal approaches and methods to value the taxpayer's total unit (or assemblage) of real and personal property. Often, particularly within the context of a unit principle appraisal of an industrial or commercial property, these analysts apply income approach property appraisal methods.

Exhibit 8
Taxpayer Property Unit
Functional Analysis Considerations
Application to the PSRP Estimate in the
Discount Rate or Capitalization Rate Development

1. Taxpayer property owner/operator organization considerations

A. Type of taxpayer owner/operator entity

1. Description of whether the taxpayer's property unit is a business entity or other type of business ownership interest
2. Description and documentation of ownership of the subject entity
3. Description of legal structure of the subject entity
4. Description of tax structure of the subject entity
5. Description of any ownership relationships with related parties, applicable parties, or other common ownership
6. Description of corporate governance (e.g., board of directors)
7. Description of operational executive or management structure (e.g., management organization chart)
8. Description of operational functions structure (e.g., departmental organization chart)
9. Description and locations of owned tangible property
10. Description and locations of leased tangible property
11. Description of owned or licensed patents
12. Description of owned or licensed trademarks
13. Description of owned or licensed copyrights
14. Description of owned or licensed trade secrets
15. Description of owned or licensed other types of intangible property
16. Description of owned or licensed intangible value in the nature of goodwill

B. Taxpayer property owner/operator entity documents

1. Organization documents (e.g., articles of the corporation)
2. Operational documents (e.g., shareholders agreements)
3. Entity ownership documents (e.g., shareholder agreements, buy/sell agreements)
4. Asset ownership documents (e.g., deeds, legal descriptions, licenses, leases)
5. Entity transferability documents (e.g., franchise agreement restrictions, regulated industry considerations)
6. Ownership interest transferability considerations (e.g., security puts and calls)
7. Recent board of directors or executive/management committee minutes
8. Copies of any business or operating permits or certificates
9. Copies of any inbound or outbound intellectual property licenses
10. Copies of any joint venture, joint development, joint commercialization, etc., agreements
11. List of registrations of all intellectual property, including domestic and international patents, copyrights, and trademarks
12. Copies of documents that illustrate the taxpayer property unit's use of domestic and international patents, copyrights, trademarks, and trade names
13. Copies of documents that illustrate the taxpayer property unit's use of other types of intangible property
14. Copies of documents that illustrate the taxpayer property unit's use of intangible value in the nature of goodwill

Exhibit 8 (cont.)
Taxpayer Property Unit
Functional Analysis Considerations
Application to the PSRP Estimate in the
Discount Rate or Capitalization Rate Development

2. Taxpayer property unit operational considerations

A. Taxpayer property unit operational functions

1. Description of products produced and services provided
2. Description of how products and services are designed, developed, or engineered
3. Description of raw materials inputs (sources, costs, and logistics of supply and supply chain risks)
4. Description of labor inputs (sources, costs, and logistics of supply and supply chain risks)
5. Description of overhead (operating expense inputs) (sources, costs, and logistics of supply and supply chain risks)
6. Description of product manufacturing or services production process
7. Description of production scheduling and quality control procedures
8. Description of product warehousing and in-process services storage
9. Description of product warranty and product return risk elements
10. Description of products and services shipping and delivery logistics
11. Description of how intellectual property (patents, copyrights, trademarks, and trade secrets) are developed, documented, and registered
12. Description of how intellectual property (patents, copyrights, trademarks, and trade secrets) are commercialized and protected
13. Description of how other types of intangible property are commercialized and protected
14. Description of how intangible value in the nature of goodwill is commercialized and protected

B. Taxpayer property unit administrative functions

1. Description of accounting functions
2. Description of receivables/cash collection function and payables/cash disbursement function
3. Description of treasury (cash management and banking relationship) function
4. Description of capitalization, capital structure, and financing functions
5. Description of products/services design and engineering function
6. Description of production engineering/services delivery efficiency function
7. Description of advertising and market research function
8. Description of packaging and branding function
9. Description of human resources, recruiting, training, and benefits function
10. Description of general counsel function
11. Description of information technology, management information, and data processing function
12. Description of regulatory compliance and other compliance functions

C. Taxpayer property unit competition and competitive position functions

1. Listing and description of principal competitors
2. Approximate size of principal competitors
3. Ranking of principal competitors by market share and by relative market share
4. Products/services features differentiation with competitors
5. Products/services pricing differentiation with competitors
6. Products/services distribution differentiation with competitors
7. Products/services intellectual property differentiation with competitors
8. Description of total market size

Exhibit 8 (cont.)
Taxpayer Property Unit
Functional Analysis Considerations
Application to the PSRP Estimate in the
Discount Rate or Capitalization Rate Development

9. Description of total market growth rate
10. Description of how customers use the taxpayer units products/services

D. Taxpayer property unit risk/expected return considerations

1. Description of materials source of supply risk
2. Description of labor source and supply risk
3. Description of operating leverage (fixed costs coverage) risk
4. Description of financing leverage (debt service coverage) risk
5. Description of tangible property risk
6. Description of environmental risk
7. Description of litigation risk
8. Description of intellectual property risk
9. Description of customer concentration risk
10. Description of executive concentration risk
11. Description of regulatory change risk
12. Description of products/services liability risk

3. Taxpayer property unit financial considerations

A. Taxpayer property unit accounting principles and financial statements

1. Descriptions of current accounting principles applied
2. Comparison of property owner/operator entity accounting principles to competitor accounting principles
3. Description of recent changes in accounting principles applied
4. Discussion of revenue recognition principles
5. Discussion of expense recognition principles
6. Discussion of taxation accrual and deferred tax principles
7. Discussion of tangible asset capitalization and depreciation principles
8. Discussion of intangible asset recognition principles
9. Discussion of liability recognition principles
10. Discussion of any adjustments to capital accounts
11. Discussion of cash flow statement working capital adjustments
12. Discussion of cash flow statement noncash revenue and expense account
13. Discussion of cash flow statement investment adjustments
14. Discussion of cash flow statement financing adjustments

B. Taxpayer property unit financial statement projection considerations

1. Description of the term (time period) of any financial projections
2. Description of the level of detail included in any financial projections
3. Description of financial projections internal development procedures
4. Description of financial projections internal review procedures
5. Comparison of financial projections to historical financial statements
6. Comparison of financial projections to guideline company financial projections
7. Comparison of financial projections to industry financial projections

Exhibit 8 (cont.)
Taxpayer Property Unit
Functional Analysis Considerations
Application to the PSRP Estimate in the
Discount Rate or Capitalization Rate Development

8. Comparison of historical financial projections to historical financial statements for prior projection periods
9. Copies of any strategic plans or competitive analyses
10. Copies of any debt service payment projections (including any considerations of liquidity or solvency)

C. Taxpayer property unit appraisal considerations

1. Description of the process for selecting guideline public companies
2. Procedures for assessing the taxpayer unit's comparability to selected guideline public companies
3. Procedures for adjusting the financial data of guideline public companies
4. Description of the process for selecting guideline M&A transactions
5. Procedures for assessing the taxpayer unit's comparability to selected guideline M&A transactions
6. Procedures for adjusting the financial data of selected guideline M&A transactions
7. Description of any recent offers to buy the taxpayer unit or the taxpayer unit's securities
8. Description of any recent sales (or other exchanges) of the taxpayer unit or the taxpayer unit's securities
9. Descriptions of any value indications (including historical development costs) of tangible real property and tangible personal property
10. Descriptions of any value indications (including historical development costs) of intellectual property or associated intangible property

4. Taxpayer property unit assets employed and SWOT/risks assumed considerations

A. Taxpayer property unit assets employed

1. Description of—and use of—cash and marketable securities
2. Description of—and use of—accounts receivable
3. Description of—and use of—prepaid expenses
4. Description of—and use of—inventory accounts
5. Description of—and use of—other current asset accounts
6. Description of—and use of—land and buildings
7. Description of—and use of—tangible personal property
8. Description of—and use of—other tangible assets
9. Description of—and use of—intellectual property assets
10. Description of—and use of—other identifiable intangible assets
11. Description of—and use of—intangible value in the nature of goodwill
12. Description of—and use of—nonoperating or investment assets
13. Description of—and use of—current liabilities
14. Description of—and use of—long-term interest-bearing debt
15. Description of—and use of—other long-term liabilities
16. Description of—and use of—contingent liabilities

Exhibit 8 (cont.)
Taxpayer Property Unit
Functional Analysis Considerations
Application to the PSRP Estimate in the
Discount Rate or Capitalization Rate Development

B. Taxpayer property unit SWOT and risks assumed considerations

1. List of the principal competitive strengths
2. Description of how competitive strengths affect the taxpayer property unit's operating results
3. Description of how competitive strengths affect the taxpayer property unit's risks
4. List of the principal competitive weaknesses
5. Description of how competitive weaknesses affect the taxpayer property unit's operating results
6. Description of how competitive weaknesses affect the taxpayer property unit's risks
7. List of the principal competitive opportunities
8. Description of how competitive opportunities affect the taxpayer property unit's operating results
9. Description of how competitive opportunities affect the taxpayer property unit's risks
10. List of the principal competitive threats
11. Description of how the principal competitive threats affect the taxpayer property unit's operating results
12. Description of how the principal competitive threats affect the taxpayer property unit's risks

Most of these property appraisal analyses involve the analyst's measurement of the property's cost of capital. This cost of capital becomes the basis for the analyst's development of the applicable yield capitalization rate or direct capitalization rate.

For many unit principle property appraisals, the discount rate and direct capitalization rate include the analyst's estimate of a property-specific risk premium. This discussion describes various procedures that analysts may apply to estimate the PSRP.

This discussion explained the reasons why the PSRP should be included in the various Ke measurement models. This discussion also described the qualitative factors that the analyst considers in the judgment-based PSRP estimate. This PSRP estimate is one component of what is often called "alpha" in the measurement of a property-specific cost of capital.

This discussion summarized the market-derived, empirical data sources that the analyst may consider as a proxy—or benchmark—in the quantitative estimate of the PSRP. These empirical data sources do not directly measure the PSRP. That is because the PSRP is unique to each individual property unit. However, these empirical data sources provide general guidance to support the PSRP estimate.

Finally, this discussion summarized one procedure that impacts both the qualitative and quantitative assessment of the PSRP: the functional analysis of the taxpayer's property as a component of the unit principle property appraisal.

Notes:

1. 2018 Cost of Capital: Annual U.S. Guidance and Examples, Duff & Phelps Cost of Capital Navigator.
2. Gary R. Trugman, *Understanding Business Valuation: A Practical Guide to Valuing Small to Medium Sized Businesses*, 5th ed. (Hoboken, NJ: John Wiley & Sons, 2017), 545.
3. Ibid., 546.
4. Ibid.
5. Ibid.
6. Ibid., 552.
7. Duff & Phelps *2017 Valuation Handbook – U.S. Guide to Cost of Capital* (Hoboken, NJ: John Wiley & Sons, 2017), Exhibit A-3.
8. Shannon P. Pratt and Alina V. Niculita, *Valuing a Business: The Analysis and Valuation of Closely Held Companies*, 5th ed. (NY: McGraw Hill Companies, 2008), 185.
9. PSRP may also be relevant when valuing real property, personal property, and other types of illiquid investments. When applying an *investment*-specific risk premium in analyses where the valuation subject is not a business interest,

Exhibit 9
12 Steps of the Functional Analysis
Considered in the Property Unit PSRP Estimate

1	**Gather and review all relevant property unit owner/operator legal documents**
	(This step includes documents regarding organization structure, legal firm, tax status, and owners—e.g., shareholder, partnership, LLC member—agreements.)
2	**Gather and review all relevant property unit owner/operator organization charts**
	(This step includes both personnel reporting charts and functional relationship clients and considers both entity governance procedures and quality, quantity, tenure, and experience of entity/function leaders.)
3	**Understand and document the products/services design, R&D, and products/services differentiation functions**
	(This step includes the assessment of how the taxpayer property unit's products or services are developed and how these products or services are intended to address their competition in the relevant marketplace.)
4	**Understand and document the materials, labor, and overhead procurement function**
	(This step includes consideration of how and when the taxpayer property unit procures all of its materials, labor, and overhead inputs—for entities in every type of industry or profession.)
5	**Understand and document the products/services production function**
	(This step includes the assessment of how the taxpayer property unit processes all of its material, labor, and overhead components to produce a product or a service—including the quality control of the product or service production.)
6	**Understand and document the inventory and products/services storage function**
	(This step includes both the in-process and finished inventory of goods and the in-process and finished inventory of services.)
7	**Understand and document the sales and marketing function**
	(This step includes the assessment of the taxpayer property unit products or services pricing, packaging, advertising, promotional, trademark development and protection, and other branding—on a stand-alone basis and in response to competitive products and services.)
8	**Understand and document the shipping and distribution logistics function**
	(This step includes consideration of how the taxpayer property unit products or services are delivered to the customer or the client—including freight, insurance, returns, warranty and repairs, and other expenses.)
9	**Understand and document the accounting, finance, information systems, human resources, legal, and other administration functions**
	(This step includes the assessment of how (a) information is generated and used throughout the taxpayer organization, (b) human resources are developed and administered, (c) financial statements and operational documents are prepared and used, (d) how cash management and treasury operations are performed, and (e) how the taxpayer company is capitalized with debt and equity capital sources.)
10	**Assess and document the taxpayer property unit owner/operator strategic position in comparison to competitors in the relevant industry or profession**
	(This step includes (a) measurement of the taxpayer property unit's market share/selective market share, market size, and market growth rate; (b) evaluation of the taxpayer property unit's customer or client needs; and (c) assessment of the entity's competitive strengths, weaknesses, opportunities, and threats.)
11	**Describe and document the assets used by the taxpayer property unit owner/operator to perform the functions**
	(This step includes a listing, description, and assessment of relative importance/contribution of (a) all working capital accounts, (b) all tangible property types and accounts—owned and leased, (c) all general intangible property types and accounts—owned and licensed, and (d) all intellectual property types and accounts—owned and licensed.)
12	**Evaluate and document the risks assumed by the taxpayer property unit owner/operator to perform the functions**
	(This step includes a listing, description, and assessment of all products/services liability, operating language, financial leverage, environmental, supply dependence, customer dependence, technology dependence, employee dependence, intellectual property dependence, tax litigation, commercial litigation, credit and collection, inventory control, property and casualty, foreign exchange, market/competitor, and other risks.)

similar considerations should be made with regard to the (1) validity of the investment-specific risk premium, (2) the legal/statutory limitations on the use of an investment-specific risk premium, and (3) appropriate level of the subject- investment-specific risk premium.

10. The inclusion of a PSRP in an analyst's assignment is not necessarily limited to valuations. The PSRP may also be applied in damages measurements, transfer price analyses, and numerous other analyst engagements.
11. Rolf W. Banz, "The Relationship between Return and Market Value of Common Stocks," *Journal of Financial Economics* (March 1981).
12. Roger J. Grabowski, "The Size Effect Continues to Be Relevant When Estimating the Cost of Capital," *Business Valuation Review* 37, no. 3 (Fall 2018): 94
13. Duff & Phelps *2017 Valuation Handbook— U.S. Guide to Cost of Capital*, 8.
14. Ibid., 8-1.
15. Duff & Phelps 2019 Cost of Capital: Annual U.S. Guidance and Examples, Cost of Capital Navigator, 12.
16. Ibid.
16. Ibid., 15.
17. Jim Hitchner, "How to 'Rig' a Valuation: The Discount Rate," *Financial Valuation and Litigation Expert* (February/March 2013).
18. Moody's "Rating Scale and Definitions."

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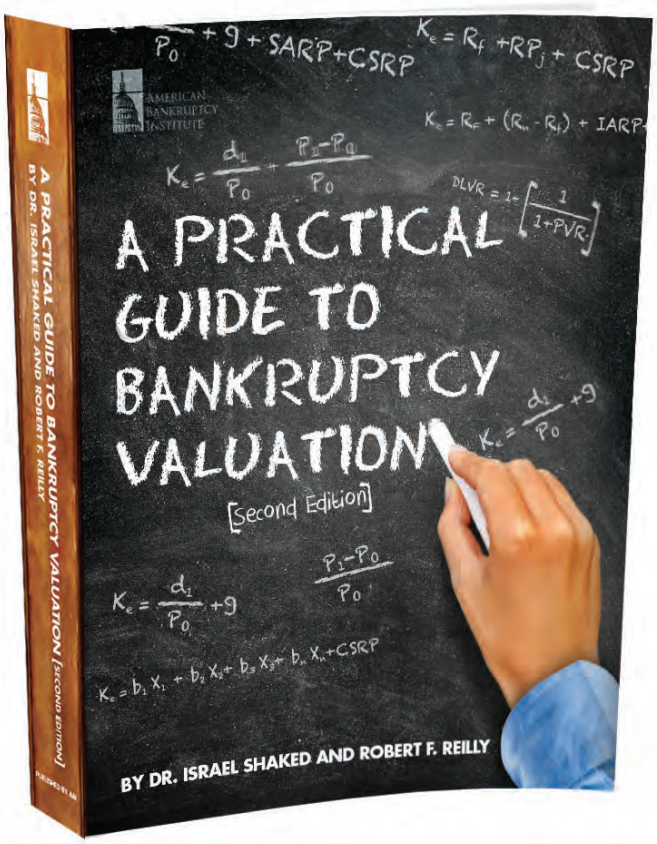

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A PRACTICAL GUIDE TO BANKRUPTCY VALUATION

Dr. Israel Shaked and Robert F. Reilly

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Common Misconceptions regarding the Measurement of Obsolescence in Unit Principle Appraisals

Connor J. Thurman and John C. Ramirez

The industrial and commercial property (e.g., special purpose property) of some corporate taxpayers is assessed for ad valorem property tax purposes based on the unit principle of property appraisal. That is, these taxpayer's industrial or commercial property is valued as one operationally, functionally, and economically integrated "unit." Valuation analysts ("analysts") working for either taxing authorities or taxpayers may apply cost approach methods to value the taxpayer's special purpose property. As part of the application of the cost approach appraisal methods, analysts should consider all components of depreciation—including functional and external obsolescence. The measurement of obsolescence is sometimes a topic of disagreement between analysts in property tax assessment appeals. This discussion focuses on several common misconceptions related to the measurement of obsolescence in the appraisal of special purpose industrial or commercial property. And, this discussion recommends several best practices responses to these common misconceptions.

Introduction

The industrial or commercial property of some types of corporate taxpayers may be valued based on the unit principle of property appraisal. That is, the taxpayer's industrial or commercial property may be valued as a single-operating "unit."

One generally accepted unit principle property appraisal approach is the cost approach. The cost approach is particularly applicable to the appraisal of special purpose industrial or commercial property. One component of every generally accepted cost approach appraisal method is the analyst's consideration of the functional obsolescence ("FO") component and the external obsolescence ("EO") component of property depreciation.

First, the valuation analyst ("analyst") has to identify the causes/types of obsolescence that may affect the taxpayer's special purpose property. Second, the analyst has to measure the obsolescence adjustment (or allowance), if any, to the property cost measurement. The analyst typically categorizes the obsolescence adjustment as either FO or EO.

This discussion presents a nonexhaustive list of five misconceptions regarding the identification and quantification of obsolescence in the cost approach appraisal of industrial or commercial property. These five misconceptions may arise in a tax assessment appeal or litigation related to the appraisal of the taxpayer's property. These misconceptions often relate to the measurement of FO or EO in the cost approach appraisal of the special purpose property.

Misconception #1

The effects of EO are only temporary. That is, the causes of any EO will correct themselves over time.

Therefore, the effects of any EO should not affect the assessment date value of the taxpayer's industrial or commercial property.

Best Practices Response #1

The effects of EO on the taxpayer's property are often temporary. This is because many of the causes of EO are cyclical.

The relevant consumer demand in the taxpayer's industry may increase or decrease over time. Demand changes and competitive factors can cause product prices of goods or services to fluctuate over time. The cost of essential raw materials may vary significantly over time. And, interest rates and investor expectations are generally cyclical. Therefore, the taxpayer property owner's required rate of return on investment will likely change over time.

With recognition of all of the above truisms, the objective of the property tax assessment is to value the taxpayer's property as of a specific point in time. This specific point in time is usually the statutorily defined "as of" valuation date. It is not the responsibility of the taxpayer property owner or the analyst to speculate as to what the taxpayer's property value may be at some time in the future. The industrial or commercial property appraisal should be performed as of a specific date (defined by statute in the specific taxing jurisdiction).

The taxpayer property appraisal should consider all of (and only) the obsolescence in effect as of that valuation date. The property appraisal should typically not consider whether the amount of obsolescence (whether FO or EO) will increase or decrease in the future.

Misconception #2

The taxpayer did not recognize a tangible property impairment charge on its financial accounting statements. Yet, the taxpayer is claiming an obsolescence adjustment for property tax assessment purposes.

If the taxpayer's property value really suffers from obsolescence, then the taxpayer should "write down" the tangible property value on its financial accounting statements.

Best Practices Response #2

The following discussion considers three principal differences between (1) the recognition of property obsolescence for property tax appraisal purposes and (2) the recognition of a tangible property impairment for financial accounting purposes.

These three principal differences relate to (1) the starting point from which to make the value adjustment, (2) the appropriate standard of value to apply, and (3) the specific accounting guidance tests for recognizing an impairment charge for financial accounting purposes.

There are two U.S. generally accepted accounting principles ("GAAP") provisions related to the financial accounting recognition of property impairment:

1. Financial Accounting Standards Board ("FASB") Accounting Standards Codification ("ASC") topic 350 *Intangibles—Goodwill and Other* and
2. FASB ASC topic 360 *Property, Plant and Equipment*.

ASC topic 350 presents the GAAP guidance for the impairment testing and impairment recognition related to intangible personal property ("IPP")—including goodwill and identifiable intangible assets. ASC topic 360 presents the GAAP guidance for the impairment testing and impairment recognition related to plant, property, and equipment (i.e., real estate and tangible personal property).

First, in a cost approach appraisal of an industrial or commercial property, obsolescence is typically measured as an adjustment to either (1) replacement cost new ("RCN") less depreciation or (2) reproduction cost new ("RPCN") less depreciation.

In the financial accounting recognition of a tangible property impairment, the adjustment is measured against the accounting net book value of the recorded property. Net book value is measured as original cost less accounting depreciation.

Typically, neither RCN nor RPCN is equal to original cost. Also, appraisal depreciation is typically not equal to accounting depreciation.

Second, both ASC topic 350 and ASC topic 360 are based on the fair value standard of value. Most property tax statutes are based on the fair market value (or a conceptually equivalent) standard of value. The differences in the two standards of value can (and often do) result in different value indications.

Third, both ASC topic 350 and ASC topic 360 provide very specific rules and tests for the recognition of an asset impairment. For example, for long-lived tangible property (i.e., property, plant, and equipment), the ASC topic 360 test allows for the recognition of an asset impairment only if the sum of all future undiscounted cash flow expected to be generated by the property is less than the property's net book value (or carrying value). There

is no present value procedure performed in the ASC topic 360 impairment test.

Accordingly, it is extremely unlikely that a long-lived tangible property will "fail" the ASC topic 360 sum of all future cash flow test and, therefore, be subject to an asset impairment recognition.

In contrast, it is much more likely that a property will fail the present value of future cash flow test that is often applied in a cost approach economic obsolescence measurement analysis.

Misconception #3

The economic obsolescence measurement in the cost approach is based on the subject property's income metrics. Therefore, the cost approach appraisal analysis is just another application of the income approach.

Best Practices Response #3

The statement above may be absolutely true if the analyst did not correctly develop the economic obsolescence measurement analysis. A cost approach economic obsolescence measurement analysis should be independent of the income approach property appraisal analysis.

Both the cost approach and the income approach may rely on a consistent set of property valuation variables, such as a property-specific discount rate or direct capitalization rate. However, the economic obsolescence measurement analysis should not be influenced by the conclusion of the income approach property appraisal analysis.

Some inexperienced analysts erroneously measure economic obsolescence as a "plug number"—or a residual amount. That is, first, the analyst quantifies the cost approach value indication as: replacement/reproduction cost new less physical depreciation less FO (for our purposes, "RCNLDFO"). Second, the analyst quantifies the income approach value indication. Third, the analyst subtracts the income approach value indication from the RCNLDFO value indication in order to measure any economic obsolescence. Last, the analyst subtracts any economic obsolescence from RCNLDFO in order to arrive at the cost approach value indication.

Applying this mathematically circular procedure, the income approach value indication will always be approximately equal to the cost approach value indication. Also, the cost approach economic obsolescence measurement is not independent of the income approach appraisal analysis. In fact, the cost approach value indication is entirely influenced by the income approach value indication.

Accordingly, this "plug" or residual procedure for quantifying the cost approach economic obsolescence is fundamentally flawed.

Economic obsolescence is almost always calculated on a comparative basis. Some of the many comparisons include the following:

1. Actual versus historical margins, returns, units, or prices
2. Actual versus budgeted margins, returns, units, or prices
3. Actual versus required returns (i.e., costs of capital)
4. Actual versus benchmark (comparable property or industry average) results

These comparative analyses may involve some of the same data elements that were considered in the income approach appraisal analysis (e.g., unit volume, average selling price, profit margins, etc.). However, the results of these comparative analyses should be totally independent of the results of the income approach appraisal analysis.

One comparative analysis that is not appropriate is (1) the income approach value indication compared to (2) the cost approach value indication—before the recognition of economic obsolescence.

A well supported economic obsolescence analysis can (and should) stand on its own analytical merits. It should (and can) be independent of the income approach appraisal analysis. With an economic obsolescence measurement analysis based on comparative financial or operational variables, the cost approach can (and should) provide a value indication that is totally independent from the income approach value indication.

Misconception #4

Total depreciation (including FO and EO) is implicitly recognized in both the sales comparison (or market) approach and the income approach.

If the taxpayer also explicitly recognizes FO and EO in the application of the cost approach, then that taxpayer property appraisal double counts (or exaggerates) the impact of obsolescence.

Best Practices Response #4

Consistent with generally accepted appraisal professional practices, a cost approach analysis should recognize all components of total depreciation. This includes physical deterioration or depreciation, FO, and EO. All of these components of total depreciation are implicitly recognized in both the income

approach and the sales comparison (or market) approach. All of these components of total depreciation should be explicitly recognized in the application of the cost approach.

Unless all three property appraisal approaches include (implicitly or explicitly) all components of depreciation (including FO and EO), then the value indications of the three approaches will not reconcile in the valuation synthesis and conclusion procedure.

Accordingly, it is inappropriate to exclude consideration of obsolescence from any of the three generally accepted property appraisal approaches.

Misconception #5

The effects of FO and EO are already included in the physical depreciation estimate, if the physical depreciation is based on cost estimation guide depreciation tables from, for example, Marshall Valuation Service.

Therefore, the taxpayer property appraisal will double count (or exaggerate) the impact of obsolescence by considering both (1) a discrete FO and EO adjustment and (2) a physical depreciation allowance extracted from a cost estimation guide's depreciation table.

Best Practices Response #5

The premise of this misconception is factually incorrect. The standard cost estimation guide depreciation tables, such as those published in Marshall & Swift's Marshall Valuation Service, are designed to include two components only (1) normal physical depreciation and (2) normal FO due to changes in construction materials and techniques.

Therefore, it is true that some influences of FO may be included in the standard cost estimation guide depreciation tables. These ordinary, age-related influences would relate to the structural deficiencies of all industrial or commercial properties of a certain age. Examples of these age-related influences include (1) the width of interior and exterior walls in older factories, and (2) the size and number of support stanchions in older warehouses.

However, the standard cost estimation guide depreciation tables do not recognize any influences of FO that are (1) property-specific and (2) not dependent on age. Examples of these factors may include inefficient layout or design, technologically obsolete equipment, excess production labor costs or material handling costs, and many others.

Furthermore, almost by definition, the standard cost estimation guide depreciation tables do not include consideration of EO. This is because the influences of EO are, by definition, external to the physical property.

Accordingly, it is a generally accepted appraisal procedure for the analyst to extract physical depreciation and age-related (or ordinary) FO from a standard cost estimation depreciation table. The analyst then has to complete the cost approach appraisal analysis by discretely quantifying any property-specific (or extraordinary) FO and EO.

Summary and Conclusion

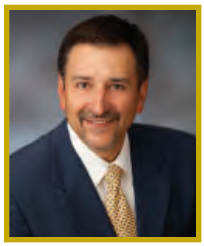
The industrial and commercial property of some types of taxpayers is typically assessed for property tax purposes based on the unit valuation principle of property appraisal. For special purpose industrial or commercial property, analysts often apply the cost approach methods to appraise the taxpayer's property.

As part of an application of these cost approach appraisal methods, analysts should consider all components of total depreciation, including functional obsolescence and external obsolescence.

The measurement of obsolescence may become an area of disagreement in taxpayer property assessment appeals or litigation. This discussion presented five misconceptions that relate to the measurement of obsolescence. And, this discussion recommended best practice responses related to these five obsolescence measurement misconceptions.

Taxpayers, taxing authorities, tax counsel, and analysts should all be aware of these misconceptions regarding the measurement of obsolescence. This obsolescence discussion particularly relates to the application of the cost approach to appraise the taxpayer's special purpose property.

All parties to the property tax process should avoid these misconceptions in the pursuit of a supportable and credible appraisal of the taxpayer's special purpose industrial or commercial property.



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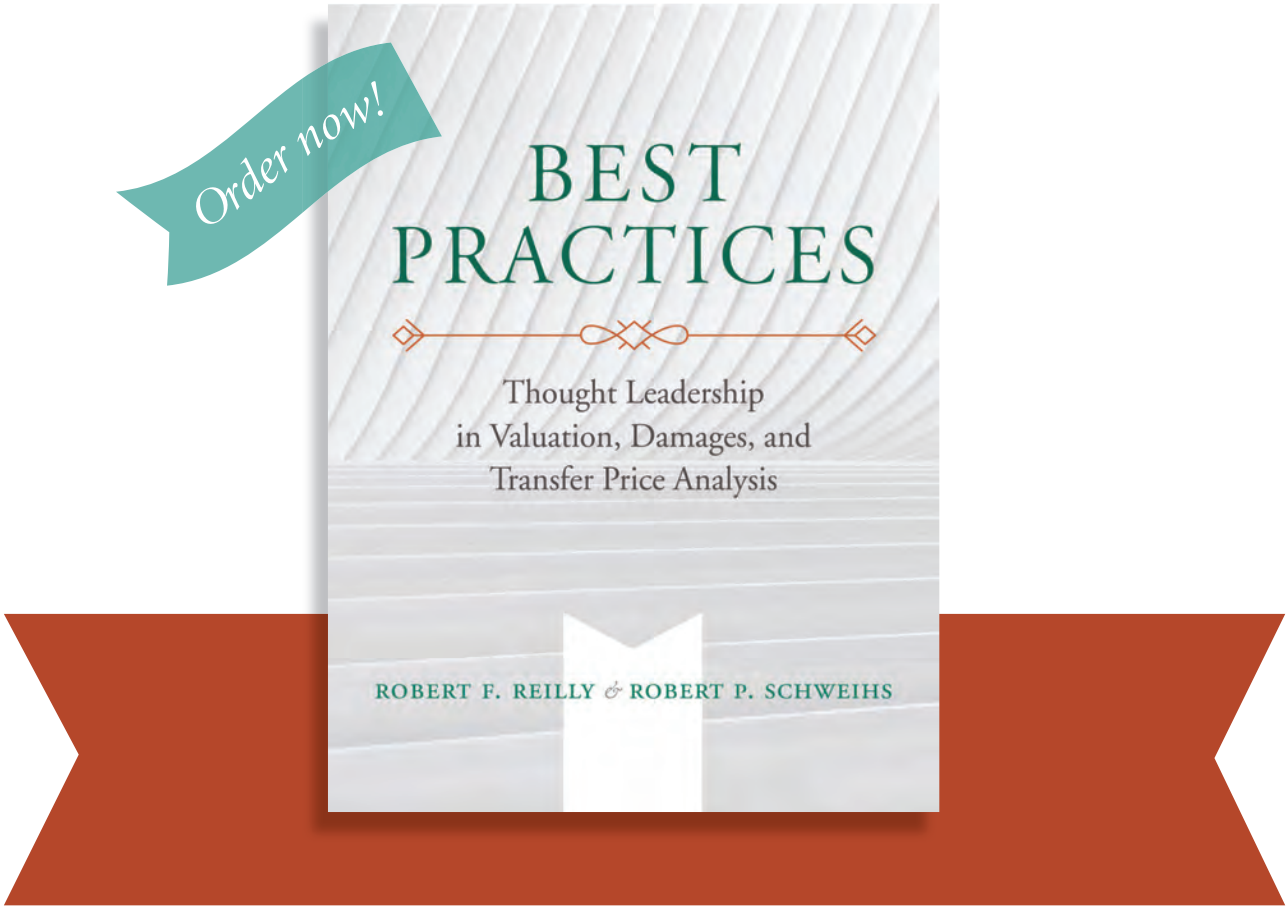

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F Reorganizations and S Corporation Acquisitions

Nathan P. Novak, George H. Haramaras, CPA, and Robert F. Reilly, CPA

Many private companies are structured as S corporations for federal income tax purposes. And, many private companies may be attractive acquisition targets—particularly to private equity firms and to leveraged management or employee buyers. This statement may be particularly true for private companies owned by baby-boomer-generation owners. Private equity firms—and management/employee buyers—often want the selling shareholders to retain a small amount of the S corporation equity. That is, the buyers want the selling shareholders to have some "skin in the game" during the ownership transition period. If this is a transaction consideration, both the corporate acquirer and the selling shareholders should consider an "F reorganization" as one component of the overall transaction structure. This discussion summarizes the income tax benefits (and the income tax costs) of an F reorganization structure as part of the sale and purchase of an S corporation.

Introduction

Valuation analysts and other financial advisers (collectively, "analysts") are often asked to advise private company business owners with regard to ownership transition planning and company sale issues. Business owners seek this advice because such analysts are trusted advisers to private company business owners.

Of course, analysts are not legal counsel or tax counsel. That statement implies that analysts should never give legal advice or tax advice. However, analysts are expected to work with the client's legal counsel and tax counsel with regard to the private company sale transaction pricing and structuring.

In particular, analysts are expected to evaluate—and to advise the transaction principals and other professional advisers with regard to—the comparative economics of alternative private company sale transaction structures.

Analysts understand that many private companies are organized as S corporations for federal income tax purposes. In many industry sectors, an economic recovery has followed the initial economic downturn caused by the COVID-19 pandemic. At the same time, many private company business owners—particularly baby boomer generation business owners—are thinking about selling their companies.

Also at the same time, many private equity firms have money to invest. Accordingly, these private equity firms have increased their activity with regard to acquiring and consolidating private companies in many industry sectors.

Analysts should be aware that one transaction tax structure that is particularly popular with regard to a private equity firm acquisition involves an Internal Revenue Code Section 368(a)(1)(F) reorganization of the private S corporation.

This discussion considers several of the reasons why business owners may want to sell—and why private equity firms may want to buy—an S corporation target company. In particular, this discussion describes what analysts need to know about the benefits to S corporation sellers of a Section 368(a)(1)(F) reorganization. That "F reorganization" is often implemented as one step in the private company sale transaction.

This discussion also describes what analysts need to know about the benefits to private equity buyers (and to certain other types of S corporation buyers) of the "F reorganization" as a component of the transaction tax structure.

Also, this discussion summarizes what analysts need to know about the procedures for implementing the F reorganization.

Finally, this discussion summarizes the tax planning considerations for the merger and acquisition ("M&A") transaction participants—and for their analysts and tax advisers—with regard to the F reorganization as part of the private company acquisition structure.

The Sale of the S Corporation Private Company

Many baby boomer private company owners have reached (or passed) retirement age. As part of their retirement plans, these private company owners may consider an exit strategy involving a business sale.

Some private companies were extremely successful during the COVID pandemic. Other private companies became financially distressed during the same COVID pandemic period. In either case, private equity firm buyers appear to have capital to invest—and an appetite for completing M&A transactions in many industries.

A typical strategy of a private equity firm is to consolidate—or roll up—several companies in the same general industry. This private equity firm acquisition strategy could be based simply on growth and size. Larger companies typically sell for higher valuation pricing multiples than do smaller companies, all other factors being equal.

The acquisition strategy could also be based on geography—related to either consolidation or diversification. Or, the acquisition strategy could be based on industry segment (service line) specialties—again, related to either consolidation or diversification.

In any event, the typical goal of the private equity firm is to buy several companies in the same general industry. The private equity acquirer consolidates the target companies, eliminates duplicative functions and costs, improves operational efficiencies, and increases profitability. Then, the private equity firm sells the recently consolidated company. That sale could be made to a strategic acquirer industry participant or it could be implemented through an initial public offering ("IPO") of the consolidated company.

In any event, the private equity firm expects to earn a profit based on the difference between (1) the total of the prices it paid for the purchase of the target companies and (2) the price it receives from the sale of the consolidated company.

Analysts should know that one typical transaction tax structure in the private equity acquisition of a target S corporation involves a Section 368(a)(1)(F) reorganization. This "F reorganization" is just one part of the overall deal structure.

Analysts should be aware that this F reorganization has benefits to the S corporation sellers who typically retain a small equity interest in the target company after the private equity acquisition.

And, analysts should be aware that this F reorganization has benefits to the private equity firm buyer that may be concerned about any issues related to the target company's S corporation tax status.

S Corporation Federal Income Tax Status

As mentioned above, analysts are aware that many private companies are organized as S corporations

for federal income tax purposes. This S corporation status provides numerous benefits to the private company owners.

S corporation income and gains are taxed only one time—at the shareholder level. In contrast, C corporation income and gains are taxed at the corporation level; and C corporation distributions are taxed again at the shareholder level.

However, analysts are also aware that there are limitations associated with the S corporation tax status. One limitation, particularly for a larger private company, is the limitation on the number of S corporation shareholders.

In 1958, when the U.S. Congress first authorized S corporations, the maximum number of shareholders was limited to 10. That limitation on the number of S corporation shareholders has increased several times since 1958. Since 2004, the maximum number of S corporation shareholders has been limited to 100.

That 100 shareholder limitation did not limit the popularity of S corporation income tax status. Since 1997, S corporations have become the most common type of corporate entity—according to Internal Revenue Service income tax return statistics. Therefore, it should not be a surprise to analysts that many private company acquisition targets are S corporations.

Analysts know that S corporations typically are not liable for federal income tax. Rather, S corporations are considered tax pass-through entities. As a tax pass-through entity, the S corporation income is taxable in the individual income tax returns of its shareholders.

Typically, private equity firm acquisitions are structured as equity (stock) acquisitions—and not as asset acquisitions. One reason for that structure is because the private equity firm often wants the selling shareholders to retain some small amount of equity (as an economic motivation) in the target company.

The private company sellers typically prefer an equity sale structure over an asset sale structure. Typically, the sellers receive capital gain treatment on any gain recognized in the stock sale. In contrast, the sellers typically receive ordinary income treatment on any gain recognized in an asset sale.

Of course, most private company buyers prefer an asset acquisition over a stock acquisition. In a stock acquisition, the buyer takes a carryover tax basis in the target company assets.

In an asset acquisition, in contrast, the buyer steps up the tax basis in the target company's assets—based on the purchase price paid for the business. That is, the buyer gets to depreciate or to amortize any purchase price premium paid (over the assets' tax basis) for federal income tax purposes.

In addition, as a nontaxation consideration, the buyer does not have to assume all of the target company's unknown or contingent liabilities in an asset purchase transaction.

For an S corporation acquisition, the buyer and the seller often make an election under either Section 338(h)(10) or Section 336(e). Such an election allows the buyer to treat the purchase of the target company stock as if it were the purchase of the target company assets, for federal income tax purposes.

Therefore, the buyer generally enjoys the income tax benefits associated with an asset acquisition transaction structure. However, analysts should be aware that such tax elections have both requirements and limitations.

First, the buyer and the sellers have to agree to—and have to coordinate—such a deemed asset purchase tax election. Second, the sellers cannot achieve a tax deferral on any rollover portion of the target company purchase transaction.

Private equity firm buyers typically require the sellers to continue to own, say, 10 percent to 20 percent of the target company. The private equity buyers sometimes refer to this rollover equity as the sellers' "skin in the game."

This rollover equity is intended to economically motivate the sellers:

1. to stay active in the target company and
2. to help make the multiple acquisition roll-up strategy successful.

In addition, the sellers may want to retain some small amount of equity ownership in the target company. This retained ownership interest allows the sellers to enjoy additional gains when the roll-up or the consolidated entity is ultimately sold—either to a corporate acquirer or in an IPO.

Buyer Concerns over the Target Company S Corporation Status

Analysts understand that one concern of any acquirer of an S corporation is that the target company has a valid S income tax status. The valid S corporation tax status is particularly important for any buyer considering a Section 338(h)(10) election.

Both Section 338(h)(10) and Section 336(e) transactions are stock purchase transactions for

"An acquisition that is preceded by an F reorganization does not experience the limitations that typically come with a Section 338(h)(10) election."

legal purposes. Both transactions are considered asset purchase transactions for federal income tax purposes.

If the target company's S income tax status is not valid, then the buyer acquired the stock of a C corporation. That is, if the target company's S tax status became invalid at any time in the past, then the buyer acquired the stock of a C corporation.

Analysts should appreciate that the economics of the Section 338(h)(10) election or the Section 336(e) election are always unfavorable when applied to a C corporation acquisition.

Therefore, S corporation buyers—including private equity buyers—may be concerned about the risk of an invalid (including an accidentally invalid) target company S status. To mitigate this invalid S tax status risk, the application of the Section 368(a)(1)(F) reorganization—as one step in the acquisition transaction—has become typical in private equity firm acquisitions of an S corporation target.

In addition, the F reorganization may also be appropriate in any sale of the S corporation where the sellers retain some equity ownership interest. One such example may be the sale of the private company to its key employees in a leveraged buyout ("LBO") transaction.

In such a key employee LBO, the employee buyers may want the sellers to retain some ownership in the target company—in order to assist with a smooth ownership transaction. Also, the company sellers may want to retain an equity interest for some period—to ensure that the key employee buyers can successfully pay down the acquisition debt (including any seller notes).

Objectives of the F Reorganization Transaction

In the S corporation acquisition, implementing an F reorganization prior to the purchase transaction is typically intended to achieve the following transaction objectives:

1. The F reorganization provides the buyer with a step-up in the depreciable tax basis of the target company assets for the purchase portion of the transaction (even if that portion of the transaction is under 80 percent).
2. The F reorganization provides the sellers with the same tax treatment as available under the Section 338(h)(10) election—but:
   a. without the requirement for an at least 80 percent sale of the company stock and
   b. with the seller's ability to achieve a tax deferral on the rollover equity portion of the transaction.
3. The F reorganization avoids the cumbersome legal considerations that are typical in an asset purchase transaction structure.
4. The F reorganization allows the target company to continue to use the same employer identification number ("EIN") for payroll tax purposes; this continuation of the EIN may be an important consideration for the target company buyer.

An acquisition that is preceded by an F reorganization does not experience the limitations that typically come with a Section 338(h)(10) election. Analysts should be aware that some of these Section 338(h)(10) election limitations include the following requirements:

1. The requirement that the transaction involves 80 percent or more of the target company stock.
2. The taxation of 100 percent of the total transaction price—even if the sellers roll over (i.e., retain the ownership of) some portion of the target company stock.
3. The requirement that the transaction involves a qualified stock purchase.

The F reorganization structure may provide an effective transaction tax structure when a tax-deferred equity rollover investment is part of the S corporation purchase/sale. And, the F reorganization structure is a particularly efficient transaction tax structure if the buyer wants to benefit from the step-up in the tax basis of the target company's assets.

The Definition of an F Reorganization

Section 368(a)(1)(F) defines an F reorganization as a mere change in identity, form, or place of organization of one corporation, however affected. This statutory definition of an F reorganization

seems short and simple. Nonetheless, this statutory definition does allow for ambiguities as to its specific requirements.

There may be other entity changes that occur within the steps of implementing an F reorganization. These other entity changes become important:

1. if the S corporation sellers are to avoid potential gain recognition and
2. if the target company buyer is to retain the tax-free nature of the F reorganization.

The Internal Revenue Service issued Regulation 1.368-2(m) in 2015. Regulation 1.368-2(m) provides six requirements that must be satisfied in order for a transaction that involves an actual or deemed transfer of property by a transferor corporation to a resulting corporation to be "a mere change" that qualifies as an F reorganization.

The objectives of Regulation 1.368-2(m) are to ensure the following:

1. Only one continuing corporation is involved in the reorganization.
2. The transaction is not acquisitive or divisive in nature.

Four of the six Regulation 1.368-2(m) requirements were known prior to 2015. These four requirements were included in the proposed regulations dating back to 2004. The fifth and sixth requirements were new. These two new requirements were added in the 2015 final regulation in order to ensure that the transferee corporation would be equivalent to the transferor corporation.

The six Regulation 1.368-2(m) requirements are summarized below. The two new requirements are described as requirements 5 and 6.

Six Requirements of the F Reorganization

Requirement Number 1

The resulting corporation stock must be distributed in exchange for transferor corporation stock. The goal of this requirement is to ensure that the transferor corporation and the transferee corporation have essentially the same stockholders.

A de minimis amount of stock issued by the resulting corporation is allowed—if that stock is issued other than in respect to the stock of the transferor corporation:

1. to facilitate the organization of the resulting corporation or
2. to maintain its legal existence.

Requirement Number 2

The identity of the stock ownership must remain the same. The same persons must own all of the transferor corporation and the resulting corporation before and after the F reorganization. The important requirement is that these same persons must own the stock "in identical proportions."

The regulations do provide some leniency with regard to the "identical proportions" requirement. That is, stockholders are permitted to exchange their shares in the transferor corporation for a different class of stock in the resulting corporation.

Such an exchange is allowed as long as:

1. the shares of stock are of equivalent value and
2. the existing shareholders can receive a distribution of money or other property from either the transferor corporation or the resulting corporation.

The shareholders can receive that distribution whether or not it is in exchange for the stock of:

1. the transferor corporation or
2. the resulting corporation.

Requirement Number 3

There must be no prior assets or attributes of the resulting corporation. The resulting corporation may not own any property or have any tax attributes immediately before the F reorganization. This requirement would not be violated if the resulting corporation holds (or held) a de minimis amount of assets.

The above statement is true if the assets are intended to facilitate the resulting corporation's organization to maintain its legal existence. And, this asset ownership requirement would not be violated if the resulting corporation:

1. holds tax attributes related to the de minimis assets or
2. holds the proceeds of borrowings undertaken in connection with the F reorganization.

Requirement Number 4

There must be a complete liquidation of the transferor corporation. In the F reorganization, the

transferor corporation must completely liquidate for federal income tax purposes.

However, the transferor corporation is not required to dissolve under applicable state law. And, the transferor corporation may retain a de minimis amount of assets for the sole purpose of preserving its legal existence.

Requirement Number 5

The resulting corporation must be the only acquiring corporation. No other corporation may hold property that was owned by the transferor corporation immediately before the F reorganization—other than the resulting corporation.

That is, as a result of the F reorganization, no other corporation may succeed to or take into account the transferor corporation's income tax attributes under Section 381.

Requirement Number 6

The transferor corporation must be the only acquired corporation. The resulting corporation may not hold property transferred from another corporation—other than from the transferor corporation.

That is, as a result of the F reorganization, the resulting corporation may not succeed to or take into account that other corporation's income tax attributes under Section 381.

Of the six requirements, the third and fourth requirements ensure that everything that the resulting corporation owns after the F corporation (with limited exceptions) came from the transferor corporation. The third and fourth requirements also ensure that the transferor corporation:

1. will not retain any assets and
2. will terminate—for income tax purposes.

Of the six requirements, the fifth and sixth requirements relate to a transaction that includes multiple acquisitions from multiple transferor corporations of property and of tax attributes. These requirements ensure that the resulting corporation settles with the tax attributes of the transferor corporation.

Concerns regarding the Step Transaction Doctrine

Analysts (and the transaction participants themselves) may be concerned that the Service will raise allegations of a step transaction. That is, analysts (and the transaction participants themselves) may be concerned that the Service's application of the step transaction doctrine may cause a failure in the proposed F reorganization.

That is, the Service may allege that the F reorganization is transitory. The Service may take the position that the F reorganization is part of a series of transactions—and it should not be considered on its own merits.

The regulations provide guidance to alleviate such analyst (and transaction participant) concerns. Regulation 1.368-2(m)(3)(ii) provides that transactions either preceding or following an F reorganization typically will not cause a failure of the reorganization to qualify under Section 368(a)(1)(F).

Even before the issuance of this regulation, the Service had issued some older revenue rulings that indicated the step transaction doctrine should not cause the failure of an F reorganization that was implemented as part of a larger transaction.[1]

Regulation 1.368-2(m)(3)(ii) (and the other revenue rulings) provide guidance to analysts (and to transaction participants) regarding how to implement a pre-transaction F reorganization as part of an M&A deal structure.

That implementation guidance is discussed next.

Implementation Guidance for an F Reorganization

For all of the reasons mentioned above, the implementation of an F reorganization may be particularly attractive in the private company M&A transaction involving a private equity acquirer.

The typical private equity acquisition structure (particularly with respect to an S corporation) often involves multiple transaction steps at multiple times. Therefore, the transaction participants (and their legal counsel) may have to engage in intentional pre-transaction structuring.

Some of the typical transaction structuring procedures include the following:

1. The S corporation ("Seller") shareholders will form a new corporation ("Seller Holdco") by contributing shares of Seller to Seller Holdco in exchange for all of the shares of Seller Holdco.
2. Seller elects to become a subchapter S subsidiary ("QSub") of Seller Holdco. That election effectuates a deemed tax-free liquidation of Seller into Seller Holdco. This procedure also extends S corporation status to

Seller Holdco—according to Revenue Rulings 64-250 and 2008-18.

All of the above-listed procedures are nontaxable events. These procedures are all considered to be part of the F reorganization. The above-described transaction procedures are similar to the procedures described as Situation 1 in Revenue Ruling 2008-18.

Analysts should note that Revenue Ruling 2008-18 does not specifically state that the illustrative transaction qualifies as an F reorganization. But, the revenue ruling does represent that the illustrative transaction procedures may qualify as an F reorganization.

In addition, the Service has issued a number of letter rulings that indicate that a contribution followed by a QSub election qualifies as a Section 368(a)(1)(F) reorganization.[2]

One additional procedure that the sellers' legal counsel typically implements after the F reorganization is to convert the Seller S corporation to a Seller limited liability company ("Seller LLC"). This conversion is typically implemented by legal counsel under the appropriate state statutes. Seller LLC remains a disregarded entity for federal income tax purposes (just as the S corporation Seller was a disregarded entity).

Analysts (and legal counsel) should be aware that the conversion of the QSub disregarded entity into an LLC disregarded entity has no federal income tax consequences. Post-conversion, Seller LLC will be a single member LLC (or an "SMLLC").

This conversion to LLC income tax status is often implemented when the acquirer is a tax pass-through entity. In such an instance, it is not efficient to have Seller as a C corporation after the acquisition closing.

The conversion to LLC income tax status also protects the acquirer's asset tax basis step-up if Seller inadvertently fails to qualify for S corporation status any time in the past. The conversion also protects the acquirer's tax basis step-up if the Seller QSub election was not properly implemented.

For example, let's assume that Seller inadvertently failed its S corporation status two years prior to a current acquisition. The procedures of (1) forming Seller Holdco and (2) converting Seller to an SMLLC will still ensure a successful F reorganization.

This is because the purported QSub election for Seller will be disregarded as a result of Seller's failure to maintain its S corporation tax status. And, the acquirer's step-up in the tax basis of the Seller assets will still be protected.

Acquisition Structuring Options

Management/employee buyers and, particularly, private equity buyers have several transaction structure options available to them after the S corporation sellers have implemented the F reorganization.

Both types of buyers (and, particularly, private equity buyers) often want the selling stockholders to retain a small equity ownership interest in the acquired company. Therefore, Seller Holdco can contribute some of the Seller equity into the buyer's acquisition structure while the remaining Seller equity is acquired directly by the buyer.

This typical transaction structure is treated as:

1. a partial rollover and
2. a partial taxable sale of an undivided interest in each of the Seller's assets.

For income tax purposes, the amount of the consideration is calculated as:

1. the cash paid plus
2. the assumptions of an associated percentage of the Seller liabilities.

"The S corporation selling shareholders—and the analysts—involved in an M&A transaction should both consider the costs and the benefits of an F reorganization transaction structure."

This transaction structure is wholly consistent with the hypothetical Situation 1 presented in Revenue Ruling 99-5.

Assuming that the Seller assets have appreciated over time, the sum of the cash paid plus the liabilities assumed will typically result in a step-up in the tax basis of the Seller assets.

To the extent that the total consideration is allocated to amortizable goodwill and other amortizable intangible assets, the Seller stockholders should find this transaction structure acceptable. For instance, these selling stockholders will not have to pay ordinary income tax (related to the depreciation recapture) on the appreciated tangible assets.

The remaining (that is, not sold) seller equity may be rolled over in exchange for the buyer equity. The buyer equity would remain, being held by Seller Holdco. The Seller stockholders would expect the rollover to be tax deferred.

Seller Holdco would carry over its tax basis in the buyer's equity—equal to the tax basis that Seller Holdco had in the contributed property.

An alternative transaction structure involves the formation of a partnership. The partnership is formed by the distribution of an ownership interest in Seller (after Seller converted to an LLC) to one of the Seller Holdco shareholders.

Alternatively, the partnership could be found by distributing an ownership interest in Seller to one or more of the target company key employees.

The result of this transaction structure is:

1. that Seller becomes a multimember (not a single member) LLC and
2. that LLC is treated as a partnership for federal income tax purposes.

After implementing this partnership formation, Seller makes a Section 754 election and, then, the buyer acquires an ownership interest in Seller. Assuming the Seller assets have appreciated over time, the buyer receives a step-up in the tax basis of the Seller assets under Section 753—as a result of the Section 754 election.

The F Reorganization Costs and Benefits

The S corporation selling shareholders—and the analysts—involved in an M&A transaction should both consider the costs and the benefits of an F reorganization transaction structure. In fact, analysts may consider such F reorganization costs and benefits from the perspectives of both the S corporation sellers and the buyer (i.e., the corporate acquiror).

To the S corporation selling shareholders, some of the F reorganization deal structure benefits include the following:

1. The selling shareholders may defer gain recognition on any rollover equity in the transaction.
2. The selling shareholders may take income tax deductions related to the transactions costs.
3. The selling shareholders may defer any gain recognition related to any deferred payments in the transaction.

These above-listed benefits are particularly relevant in the typical M&A transaction involving a private equity acquirer. These benefits are also relevant to an employee/management LBO transaction where the sellers retain an equity ownership interest during a transition period or during a debt pay-down period.

To the S corporation corporate acquirer, some of the F reorganization deal structure benefits include the following:

1. The corporate acquirer obtains a step-up in the tax basis of the S corporation's assets—for the purchased portion of the transaction.
2. The corporate acquirer avoids the risk of an invalid S corporation tax status when making the Section 338(h)(10) election.
3. The corporate acquirer avoids all of the hassle of transferring the ownership of each individual S corporation asset category in an asset purchase transaction structure.

Also, since the F reorganization involves a stock purchase transaction, the acquirer:

1. can continue to use the S corporation's federal EIN and

2. does not need to terminate and then rehire all of the S corporation employees into a new corporate organization.

Analysts—and the transaction participants—should note that the F reorganization transaction structure does not eliminate all tax (or legal) concerns. Tax due diligence is still required on the part of legal counsel to the corporate acquirers. This is because the buyer still assumes some tax liabilities related to the S corporation target company. After all, the buyer is acquiring the S corporation legal entity!

There may be a debate among analysts as to how much of the S corporation's historical income tax exposure the buyer (particularly the S corporation holdco) assumes after an F reorganization. Whatever the amount of that historical tax liability exposure is, it is probably not zero!

In addition to the tax liability issues, the analyst should advise the buyer that it would certainly assume all of the S corporation's historical legal liabilities in this stock acquisition structure.

Summary and Conclusion

Analysts (including valuation analysts and other financial advisers) are aware that many private companies are structured as S corporations for federal income tax purposes. Post-COVID, many private companies are positioned either as corporate acquirers or as acquisition targets.

With capital to invest, many private equity buyers have increased their M&A activity across many industries. These private equity buyers either roll up geographic competitors, assemble companies with complementary specializations, or acquire (and improve) companies with less-than-stellar operating results.

In addition, many private companies may be candidates for leveraged management buyouts or for leveraged employee buyouts.

In all of these transactional situations, the buyers often want some or all of the S corporation sellers to retain some noncontrolling ownership interest in the acquired company. This so-called rollover capital motivates the sellers to ensure a smooth transition and/or to assist the private equity buyer with a roll-up strategy.

In any event, a Section 368(a)(1)(F) reorganization implemented just prior to the S corporation acquisition may provide significant income tax benefits both:

1. to the S corporation selling shareholders and
2. to the corporate acquirer.

"With capital to invest, many private equity buyers have increased their M&A activity across many industries."

This discussion considered some of the typical private company acquisition strategies of the private equity buyer. This discussion summarized what analysts need to know about the income tax considerations—to both the S corporation sellers and to the buyer—of the F reorganization transaction component.

This discussion described what analysts need to know about the steps and procedures involved in implementing the pre-transaction F reorganization transaction component. And, this discussion considered both the costs and the benefits of the F reorganization structure—both to:

1. the S corporation selling shareholders and
2. the corporate acquirer.

Analysts are typically considered trusted advisers to private company owners. However, analysts are not legal counsel. Analysts should not provide legal or taxation advice—either in a transactional or any other setting.

That said, valuation analysts and other financial advisers should consider both the tax costs and the tax benefits when advising private company business owners regarding potential company sale transaction structures.

Notes:

1. See Revenue Rulings 61-156, 64-250, 69-516, 79-250, and 96-29.
2. See Letter Rulings 200542013, 200701017, and 200725012.

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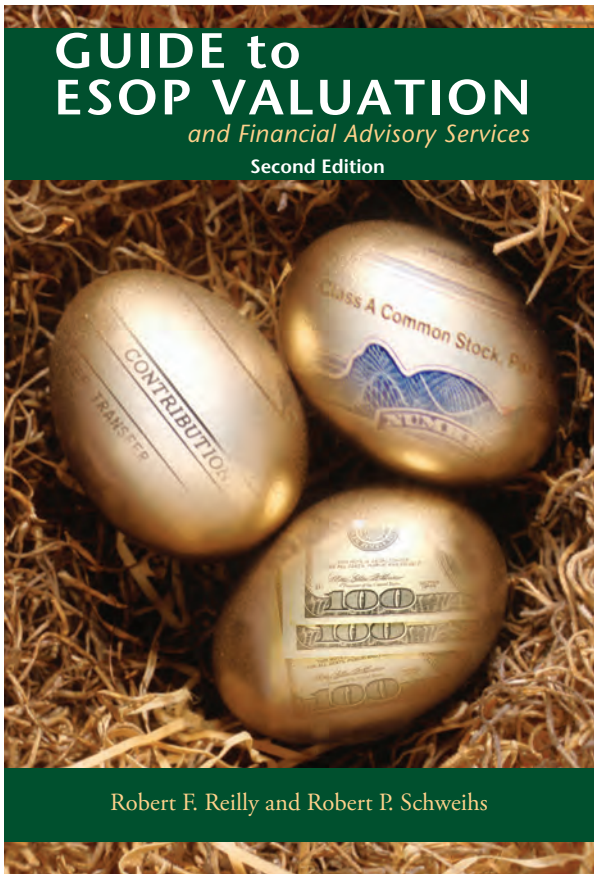

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GUIDE TO ESOP VALUATION
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Second Edition

Robert F. Reilly and Robert P. Schweihs

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On Our Website

Recent Articles and Presentations

Robert F. Reilly, a managing director of our firm, authored an article that appeared in the September 2021 issue of *Practical Tax Lawyer.* The title of Robert's article is "Tax Counsel Considerations in the Acquisition of a Tax Loss Target Company."

Tax counsel—and valuation analysts and other financial advisers (analysts)—are often retained to advise acquisitive clients with regard to proposed merger and acquisition (M&A) transactions. The analysts typically focus on the pricing and structuring of the proposed M&A transaction, while tax counsel consider all of the income tax and other tax planning and compliance issues related to structuring and completing the M&A transaction. Tax counsel should advise corporate acquirers and their analysts to be careful when pricing and structuring the potential acquisition of M&A target corporations with NOL and certain other income tax attributes. Robert's article summarizes the factors that tax counsel, acquired clients, and the client's analysts should all consider when structuring an M&A transaction that involves a target corporation with such income tax attributes.

Robert F. Reilly delivered a presentation to the annual Wichita State University Property Tax Conference. The conference was held virtually this year on July 27-28, 2021. Robert's topic was "Developing Unit Principle Valuations during COVID-Impacted Economic Uncertainty."

Robert began by reviewing unit principle valuation, including valuation approaches and methods. He explained how analysts deal with risk factors in unit principle valuations. In particular, he focused on COVID-impacted economic uncertainty as a risk factor. Robert discussed the valuation variables for each of the three generally accepted valuation approaches. Finally, Robert reviewed the proper method of documenting the unit principle valuation analysis. The presentation materials from Robert's presentation may be found on our website.

Robert F. Reilly also delivered a presentation at the 2021 Business Valuation Conference sponsored by the Texas CPA Society. The conference was held virtually on July 29, 2021. The title of Robert's presentation was "Intangible Asset Analysis—Litigation Valuations and Fair Value Measurements."

Robert began by reviewing the reasons to value intangible assets, including fair value measurements. He summarized the generally accepted valuation approaches and methods. Robert then focused on the cost approach and the methods and procedures within this approach. He explored the topics of physical deterioration, functional obsolescence, and economic obsolescence. Robert discussed reaching the cost approach value conclusion, including the tax amortization benefit adjustment. Finally, Robert provided a list of common misapprehensions that analysts have with regard to the cost approach. He concluded with an illustrative example of this valuation approach.

Connor Thurman, a manager in our Portland office, and Robert F. Reilly authored an article that was published in the November 2020 and September 2021 issues of the *Practical Tax Lawyer*. The title of their article is "What Tax Lawyers Need to Know about the Measurement of Functional and Economic Obsolescence in the Industrial or Commercial Property Valuation" (Parts 1 and 2).

Connor and Robert's article summarizes best practices for both the identification and the measurement of obsolescence. First, their article summarizes what tax counsel needs to know about the various forms of obsolescence that should be considered in the cost approach valuation of industrial and commercial property for SALT purposes. Second, the article summarizes what tax counsel needs to know about the practical procedures that the client property owner, the analyst, or the taxing authority can apply to recognize the existence of any property obsolescence and measure the amount of any property obsolescence. Third, the article considers various issues related to documenting the existence of any property obsolescence as well as issues related to reporting the measurement of any property obsolescence. Fourth, the article suggests potential tax counsel responses to assessment authority objections regarding the recognition of obsolescence in the application of the cost approach. The article concludes with an illustrative example of the application of the cost approach to the valuation of an intangible asset.

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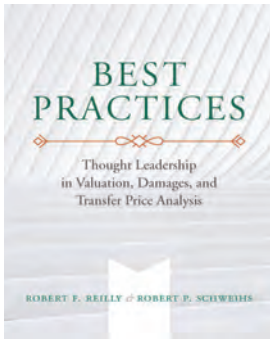

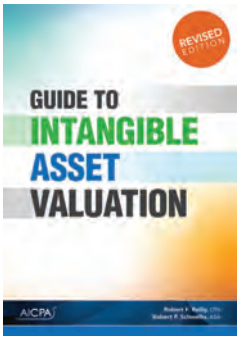

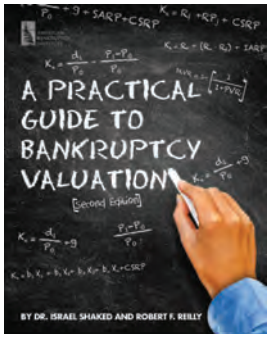

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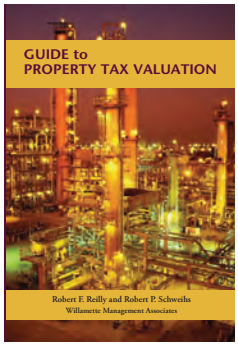

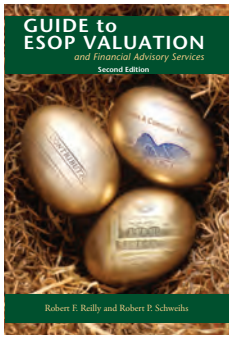

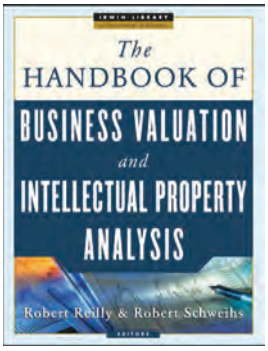

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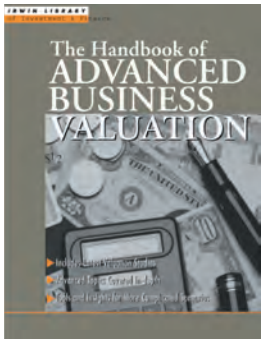

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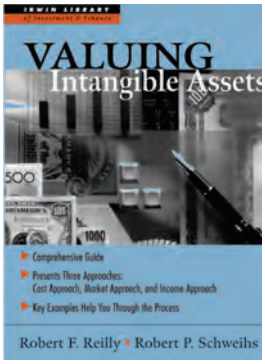

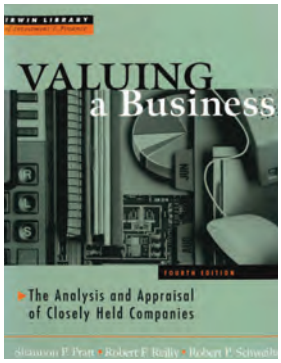

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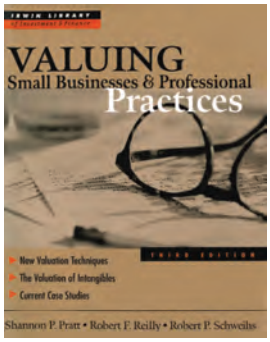

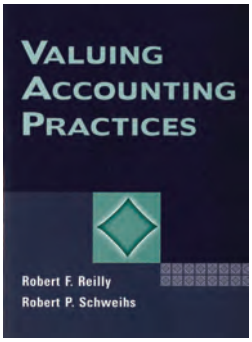

* Authored by Robert Reilly and Israel Shaked, Ph.D.
** Authored with Shannon Pratt
*** Edited by Robert Reilly and Robert Schweihs

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Communiqué

In Print

Robert Reilly, firm managing director, authored a four-part article that was published in the National Association of Certified Valuators and Analysts ("NACVA") online publication at www.quickreadbuzz.com. The first part of that series appeared in the October 13, 2021, issue and was titled "Cost Approach to Intellectual Property Valuation: Part I: Conceptual Principles." Part II appeared in the October 20, 2021, issue and was titled "Part II: Valuation Methods." Part III appeared in the October 27, 2021, issue and was titled "Part III: Practical Procedures." Part IV appeared in the November 3, 2021, issue and was titled "Part IV: Illustrative Examples."

Robert Reilly also authored an article that was published in the December 2021 issue of the *Practical Lawyer*. The title of that article was "Everything Counsel Needs to Know about the Cost Approach to Intellectual Property Analysis."

Robert Reilly also authored an article that was published in the September 2021 issue of *The Practical Tax Lawyer*. The title of that article was "Tax Counsel Considerations in the Acquisition of a Tax Loss Target Company."

Robert Reilly also authored a two-part article that was published in the journal *Construction Accounting and Taxation.* The title of part one published in the September/October 2021 issue was "Cost Approach to Value Intellectual Property, Part I: Conceptual Principles." Part two was published in the November/December 2021 issue and was titled "Cost Approach to Value Intellectual Property, Part II: Practical Applications."

Robert Reilly also authored an article that was published in the July/August 2021 issue of *Construction Accounting and Taxation*. The title of that article was "F Reorganizations in Construction Company Acquisitions."

Robert Reilly also authored an article that was reprinted in NACVA's www.quickreadbuzz.com website on July 29, 2021. The title of that reprinted article was "The Role of the Valuation Analyst in an ESOP Formation Financial Feasibility Analysis."

Robert Reilly also authored an article that was posted on the www.ALI-CLE.org website in September 2021. The title of that article was "Tax Counsel Considerations in the Acquisition of a Tax Loss Target Company" and it originally appeared in *The Practical Tax Lawyer*.

Kyle Wishing, Atlanta office vice president, authored an article that was reprinted in the October 7, 2021, issue of the National Association of Certified Valuators and Analysts online publication located at www.quickreadbuzz.com. The title of that reprinted article was "Valuation Treatment of the ESOP Repurchase Obligation Liability." The article originally appeared in their June 10, 2020, issue.

In Person

Robert Reilly will deliver a presentation on a webcast sponsored by the National Association of Certified Valuators and Analysts ("NACVA") Around the Valuation World International webcast on February 21, 2022. The topic of Robert's presentation will be "Cost Approach to Intellectual Property Valuation."

Robert Reilly and Connor Thurman, Portland office manager, delivered a presentation to a Business Valuation Resources continuing education webinar on October 21, 2020. The topic of their presentation was "Measuring, Documenting, and Defending the Analyst's Company-Specific Equity Risk Premium Selection."

Weston Kirk, Atlanta office managing director, delivered a presentation at the NACVA Georgia State Chapter meeting on December 2, 2021. The topic of Weston's presentation was "Benchmarks for Company-Specific Premiums."

Kyle Wishing, Atlanta office vice president, co-presented at the same NACVA conference on December 2, 2021. The title of Kyle's presentation was "ESOP Valuation Issues Updates."

Curtis Kimball, Atlanta office managing director, delivered a presentation at the ALI CLE Estate Planning for the Family Business Owner 2021 webcast on November 11, 2021. The title of Curt's presentation was "Valuation Update."

In Encomium

Kyle Wishing earned the Accredited Senior Appraiser ("ASA") credential in business valuation from the American Society of Appraisers.

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