Thought Leadership

Issues Related to the Treatment of an NOL Carryforward in Income Approach Valuation Methods

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Property tax assessors often value centrally assessed taxpayers using income approach unit valuation methods. Such income approach valuation methods include the direct capitalization method and the yield capitalization method. For taxpayers that have accumulated a net operating loss (NOL) carryforward, some property tax assessors (1) estimate taxpayer normalized net operating income (NOI) based on a 0 percent income tax rate but (2) apply an after-tax (i.e., tax-affected direct capitalization rate in the income approach valuation analysis. This discussion considers if such a 0 percent income tax rate assumption is appropriate in the income approach valuation of a taxpayer unit for property tax valuation purposes. And, this discussion considers if and how the use of such a 0 percent income tax rate assumption may overstate both the value of the taxpayer unit and the value of the NOL tax attribute component of the taxpayer unit.

Introduction

For ad valorem property tax purposes, the total operating assets of centrally assessed industrial and commercial taxpayers is often valued using unit valuation methods. The taxpayer unit value conclusion from the application of unit valuation methods "represents the sum of all of the taxpayer corporation real estate personal property operating assets—both tangible and intangible."[1]

Centrally assessed taxpayers subject to unit valuation methods often include telecommunication companies, railroads, airlines, pipelines, electric power companies, cable TV companies, water and wastewater companies, and other similar utility-type companies. These types of taxpayers are often centrally assessed for property tax purposes. However, similar types of taxpayers may also be locally assessed using unit valuation approaches and methods. These taxpayer companies often own and operate both tangible assets and intangible assets.

Not all taxing jurisdictions tax all categories of taxpayer assets. Some jurisdictions tax real estate only. Some jurisdictions tax tangible personal property only. Many jurisdictions tax tangible assets only (i.e., real estate and tangible personal property)—but not intangible assets (e.g., intangible personal property).

If the centrally assessed taxpayer total value concluded from a unit valuation method includes any value attributed to assets that are not subject to property taxation in the subject jurisdiction, then those nontaxable assets should be separately valued and extracted from the total taxpayer unit value.

This discussion considers the valuation and extraction of a taxpayer NOL tax attribute—and similar income tax attributes—in an income approach valuation analysis performed for property tax purposes. More specifically, this discussion considers the appropriateness of applying a 0 percent income tax rate assumption in the income projection of any income approach valuation.

This discussion focuses on the tax rate assumption applied in a direct capitalization method analysis—that is, where the taxpayer NOI is divided by a direct capitalization rate. However, this discussion

also applies to the tax rate assumption applied in a yield capitalization method analysis—that is, where the taxpayer net cash flow (NCF) is present valued at a yield capitalization rate. This discussion refers to this particular income tax rate valuation variable as the "0 percent tax rate assumption."

For purposes of this discussion, the unit valuation income approach methods include both (1) the direct capitalization method and (2) the yield capitalization method. The valuation formula that is often used in the direct capitalization method is: (1) expected NOI divided by (2) direct capitalization rate equals (3) the taxpayer total unit value.

The valuation formula that is often used in the yield capitalization method is the sum of (1) the present value of the taxpayer expected NCF estimated over a discrete projection period plus (2) a residual value (often estimated using the NCF divided by direct capitalization rate formula) equals (3) the taxpayer total unit value.

The taxpayer NOI in the direct capitalization formula represents the amount of income projected for a single future period. This projected taxpayer NOI should be normalized—or stabilized—in order to represent a typical level of expected income on a forward-looking basis.[2]

This tax rate assumption issue is relevant because some taxing jurisdictions estimate taxpayer NOI assuming a 0 percent tax rate for taxpayers with certain income tax attributes. The taxing jurisdictions that use the 0 percent tax rate assumption often support this procedure by noting the existence of a taxpayer's NOL carryforward (or similar federal income tax attribute). Often, the subject taxpayer has accumulated the federal income tax NOL carryforward due to negative operating income earned during the economic downturn of the last several years.

The taxing jurisdictions that use the 0 percent tax rate assumption often follow one of the following two procedures to estimate the normalized NOI in the income approach valuation:

1. The taxing authority calculates the taxpayer normalized NOI based on some historical average NOI such as a three-year average or a five-year average; and that historical average NOI includes years where the taxpayer used its NOL (or NOL carryback) to eliminate federal income tax expense.
2. The taxing authority calculates the taxpayer NOI based on the near-term projected NOI (such as the next fiscal year projected NOI), which may include the assumed use of the taxpayer NOL carryforward.

Either of these procedures may result in the taxing authority estimating the taxpayer normalized NOI based on a 0 percent (or a similarly low) tax rate.

In an income approach unit valuation, the taxpayer unit value is estimated based on the expected future income that is associated with the total taxpayer unit. Since any income approach valuation methodology is forward-looking, the use of the 0 percent tax rate assumption to estimate normalized NOI indicates that the NOL carryforward (which is also forward looking), and not the NOL carryback (which is backward looking), is included in the taxpayer unit value.

Therefore, the current discussion relates to a taxpayer's NOL carryforward and not an NOL carryback. This is because taxing jurisdictions that use the 0 percent tax rate assumption do not value—or assess property tax on—the taxpayer's NOL carryback.

NOL carryforwards and NOL carrybacks are discussed in the next section.

First, this discussion defines an NOL carryforward and an NOL carryback. Second, this discussion considers if an NOL carryforward (or, for that matter, any income tax attribute) should be categorized as tangible property (and would, therefore, be subject to ad valorem taxation in many taxing jurisdictions). Third, this discussion analyzes the appropriateness of the 0 percent tax rate assumption in a unit valuation analysis intended to reach a market value conclusion. Fourth, this discussion explores the appropriateness of applying an after-tax capitalization rate (whether a direct capitalization rate or a yield capitalization rate) to a pretax income stream. Fifth, this discussion describes the federal income tax statutory limitations on the use of an NOL carryforward and considers the implications of incorporating a taxpayer's NOL carryforward in a direct capitalization unit valuation. Finally, this discussion summarizes the factors that actually affect the market value of an NOL carryforward as an individual taxpayer asset. As will be discussed, an NOL is only one component of a taxpayer's deferred federal income tax (DFIT) asset or liability account.

For illustrative purposes only, this discussion considers the NOL carryforward position of a hypothetical centrally assessed taxpayer ("LossCo"). For purposes of an illustrative analysis, LossCo is a hypothetical taxpayer company with a recent history of operating losses.

In our illustrative example, LossCo:

1. reported a $10 million NOL carryforward as of December 31, 2014, in its audited financial statements;

2. reported $4 million as the NOL component of its deferred federal income tax asset account;
3. reported a net deferred income tax asset (liability) account as a liability (or credit balance) of $1 million; and
4. projected that its taxable income will equal $1 million in 2015.

Even though the NOL carryforward tax attribute component of the deferred income tax asset was positive, the LossCo reported net DFIT asset (liability) account was negative (i.e., a credit balance) as of December 31, 2014.

Definition of an NOL

An NOL:

> occurs for tax purposes in a year when tax-deductible expenses exceed taxable revenues. An inequitable tax burden would result if companies were taxed during profitable periods, without receiving any tax relief during periods of net operating losses. Under certain circumstances, therefore, the federal tax laws permit taxpayers to use the losses of one year to offset the profits of other years.
>
> Companies accomplish this income-averaging provision through the carryback and carryforward of net operating losses. Under this provision, a company pays no income taxes for a year in which it incurs a net operating loss.[3]

Accordingly, if a taxpayer company reports a taxable loss in a given year, it will not pay income taxes in the year that it generated the taxable loss (i.e., the net operating loss). The taxpayer company may (1) carry that NOL back two years and receive a refund for the amount of income taxes paid in those prior years and, if any NOL remains after the two-year carryback period (2) carry any remaining unused net operating loss forward for up to 20 years to offset future taxable income.

The ability of the taxpayer to apply the NOL to prior years is known as the *NOL carryback*, and the ability of the taxpayer to use the NOL to offset future taxable income is known as the *NOL carryforward*.

Like most income tax attributes, an NOL carryforward is not recorded as a separate asset on a taxpayer's financial statements prepared in accordance with U.S. generally accepted accounting principles (GAAP). Rather, an NOL carryforward is a tax attribute that is included as one component in the overall calculation of the deferred income tax asset (or liability) account on a taxpayer's GAAP-based balance sheet.

In addition to an NOL carryforward, differences between the taxpayer company's pretax income (reported in accordance with GAAP) and the taxpayer company's taxable income (reported in accordance with the Internal Revenue Code) also give rise to a deferred income tax asset or a deferred income tax liability. The deferred income tax account is often recorded on the taxpayer's balance sheet as DFIT.

According to the Financial Accounting Standards Board (FASB) Accounting Standards Codification (ASC) topic 740-10-10-3, "Conceptually, a deferred tax liability or asset represents the increase or decrease in taxes payable or refundable in future years as a result of temporary differences and carryforwards at the end of the current year."

These temporary (or timing) differences will result in either taxable amounts (i.e., increases in taxable income) or deductible amounts (i.e., decreases in taxable income) in future years. Examples of temporary differences that are recognized in the typical company's DFIT account are included in Table 1.

We note that the taxing jurisdictions that use the 0 percent tax rate assumption do not attempt to estimate the value of, and assess property tax on, all of the taxpayer tax attributes that comprise the DFIT account. Rather, the use of the 0 percent tax assumption typically estimates only the value of, and assesses property tax on, the taxpayer NOL carryforward tax attribute.

An NOL Carryforward Income Tax Attribute Is Not Tangible Property

Based on individual state statutes, ad valorem property tax may be assessed on a taxpayer's real property (i.e., real estate), personal property, or both categories of property. And, depending on the taxing jurisdiction, the tax may be levied on the value of the taxpayer's (1) tangible property only (with intangible property being exempt from taxation), (2) tangible property and certain intangible property, or (3) all tangible property and all intangible property. In addition, a taxing jurisdiction may specifically designate a particular asset as being exempt from ad valorem property tax.

For purposes of this discussion, let's first assume that the subject taxpayer operates in a taxing

Table 1
Examples of Temporary (or Timing) Differences That Are Recognized in a Typical Taxpayer's DFIT Asset or Liability Account

As noted in this discussion, the DFIT account reported on a taxpayer company's GAAP balance sheet may include (1) the impact of an NOL carryforward and (2) the impact of various temporary income or expense recognition differences.

The following examples of temporary income or expense recognition differences are included in ASC topic 740-10-25-20:

a. Revenue or gains that are taxable after they are recognized in financial income. An asset (for example, a receivable from an installment sale) may be recognized for revenues or gains that will result in future taxable amounts when the asset is recovered.

b. Expenses or losses that are deductible after they are recognized in financial income. A liability (for example, a product warranty liability) may be recognized for expenses or losses that will result in future tax deductible amounts when the liability is settled.

c. Revenue or gains that are taxable before they are recognized in financial income. A liability (for example, subscriptions received in advance) may be recognized for an advance payment for goods or services to be provided in future years. For income tax purposes, the advance payment is included in taxable income upon the receipt of cash. Future sacrifices to provide goods or services (or future refunds to those who cancel their orders) will result in future tax deductible amounts when the liability is settled.

d. Expenses or losses that are deductible before they are recognized in financial income. The cost of an asset (for example, depreciable personal property) may have been deducted for income tax purposes faster than it was depreciated for financial reporting purposes. Amounts received upon future recovery of the amount of the asset for financial reporting will exceed the remaining tax basis of the asset, and the excess will be taxable when the asset is recovered.

e. A reduction in the tax basis of depreciable assets because of tax credits. Amounts received upon future recovery of the amount of the asset for financial reporting will exceed the remaining tax basis of the asset, and the excess will be taxable when the asset is recovered. For example, the tax law may provide taxpayers with the choice of either taking the full amount of depreciation deductions and a reduced tax credit (that is, investment tax credit and certain other tax credits) or taking the full tax credit and a reduced amount of depreciation deductions.

f. Investment tax credits accounted for by the deferral method. Under the deferral method as established in ASC topic 740-10-25-46, investment tax credits are viewed and accounted for as a reduction of the cost of the related asset (even though, for financial statement presentation, deferred investment tax credits may be reported as deferred income). Amounts received upon future recovery of the reduced cost of the asset for financial reporting will be less than the tax basis of the asset, and the difference will be tax deductible when the asset is recovered.

g. An increase in the tax basis of assets because of indexing whenever the local currency is the functional currency. The tax law for a particular tax jurisdiction may require adjustment of the tax basis of a depreciable (or other) asset for the effects of inflation. The inflation-adjusted tax basis of the asset would be used to compute future tax deductions for depreciation or to compute gain or loss on sale of the asset. Amounts received upon future recovery of the local currency historical cost of the asset will be less than the remaining tax basis of the asset, and the difference will be tax deductible when the asset is recovered.

h. Business combinations and combinations accounted for by not-for-profit (NFPs) entities. There may be differences between the tax basis and the recognized value of assets acquired and liabilities assumed in a business combination. There also may be differences between the tax bases and the recognized values of assets acquired and liabilities assumed in an acquisition by a not-for-profit entity or between the tax bases and the recognized values of the assets and liabilities carried over to the records of a new entity formed by a merger of not-for-profit entities. Those differences will result in taxable or deductible amounts when the reported amounts of the assets or liabilities are recovered or settled, respectively.

The textbook *Intermediate Accounting* provides the following additional examples of temporary differences that result in either deferred federal income tax asset or deferred federal income tax liability accounts:

Revenue or gains are taxable after they are recognized in financial income.

- Sales accounted for on the accrual basis for financial reporting purposes and on the installment (cash) basis for income tax purposes.
- Contracts accounted for under the percentage-of-completion method for financial reporting purposes and a portion of related grow profit deferred for income tax purposes.
- Investments accounted for under the equity method for financial reporting purposes and under the cost method for income tax purposes.

Expenses or losses are deductible after they are recognized in financial accounting income.

- Product warranty liabilities.
- Estimated liabilities related to discontinued operations or restructurings.
- Litigation accruals.

Revenue or gains are taxable before they are recognized in financial accounting income.

- Subscriptions received in advance.
- Advance rental receipts.
- Sales and leasebacks for financial reporting purposes (income deferral) but reported as sales for income tax purposes.

Expenses or losses are deductible after they are recognized in financial accounting income.

- Depreciable property, depletable resources, and intangible assets.
- Deductible pension funding exceeding expense.
- Prepaid expenses that are not deducted on the income tax return in the period paid.

Source: Kieso, Weygandt, and Warfield, *Intermediate Accounting*, 15th ed., 1127.

jurisdiction that taxes real estate and tangible personal property (but not intangible personal property). Since this hypothetical jurisdiction only assesses ad valorem property tax on real estate and tangible personal property, we will analyze a taxpayer's NOL tax attribute to determine if it is appropriately categorized as either of these two property types. Next, we define the relevant types of property in our hypothetical taxing jurisdiction.

The following property type definitions are presented from the *Dictionary of Real Estate Appraisal*:

- Real estate is "an identified parcel or tract of land, including improvements, if any."[4]
- Personal property includes "identifiable tangible objects that are considered by the general public as being 'personal'—for example, furnishings, artwork, antiques, gems and jewelry, collectibles, machinery and equipment; all tangible property that is not classified as real estate."[5]
- Tangible property is "property that can be perceived by the senses; includes land, fixed improvements, furnishings, merchandise, cash, and other items of working capital used in an enterprise."[6]

The *Dictionary of Real Estate Appraisal* does not specifically define tangible personal property. And, the *Dictionary of Real Estate Appraisal* definition of tangible property includes both real estate and personal property. Together, the above three definitions provide a helpful understanding of what is—and what is not—real estate and tangible personal property.

Let's also consider the common legal definitions of various categories of property. The following legal definitions are presented from *Black's Law Dictionary*:

- Real property is "[l]and and anything growing on, attached to, or erected on it, excluding anything that may be severed without injury to the land."[7]

- Personal property is "[a]ny movable or intangible thing that is subject to ownership and not classified as real property."[8]
- Tangible property is "[p]roperty that has physical form and characteristics."[9]

These property definitions are consistent with the property definitions included in the *Dictionary of Real Estate Appraisal*.

Based on the above definitions, an NOL carryforward (defined in the prior section of this discussion) is clearly not real estate. This is because an NOL carryforward is not land or a land improvement.

Likewise, an NOL carryforward is not tangible personal property. The *Dictionary of Real Estate Appraisal* definition of tangible property broadly includes cash and "other items of working capital." However, financial assets such as these are not typically regarded as tangible personal property. For example, the valuation textbook *Guide to Intangible Asset Valuation* (*GIAV*) considers cash and other financial assets to be components of intangible personal property.[10]

Even considering the broad definition of tangible property presented in the *Dictionary of Real Estate Appraisal*, an NOL carryforward would not be categorized as tangible property. This is because the above definition of tangible property is limited to property that can be perceived by the senses. There is no physical attribute associated with a taxpayer's NOL tax attribute. That is, an NOL carryforward cannot be seen or touched, unlike a dollar bill (for example), which *can* be seen and touched.

Based on the above considerations, a taxpayer's NOL carryforward tax attribute should not be classified as either tangible real property (i.e., real estate) or tangible personal property.

An understanding of how an NOL carryforward is categorized for financial accounting purposes may be useful to determine if the NOL tax attribute should be subject to property tax in our hypothetical taxing jurisdiction.

For example, if real estate and tangible personal property are the only categories of property that are subject to property taxation in a subject taxing jurisdiction, then the assessment should not include the value of the taxpayer NOL carryforward tax attributes (or any other individual income tax attributes).

Also, if all categories of property are subject to property taxation in a subject taxing jurisdiction, then it is noteworthy that an NOL carryforward as an individual tax attribute is not a property (or asset) of the taxpayer. Rather, an NOL carryforward is just one tax attribute that is a component of the calculation for the taxpayer's DFIT asset or liability account.

And, while the DFIT account may be classified as property, it may have a positive value or a negative value. That is, depending on the interplay of all of the taxpayer's income tax attributes, the taxpayer's DFIT account may be an asset (i.e., have a debit balance) or a liability (i.e., have a credit balance).

To our knowledge, an NOL carryforward balance is not taxable in a jurisdiction that taxes only real estate and tangible personal property. Also, to our knowledge, an individual income tax attribute (without consideration of the taxpayer's overall DFIT account balance) is not taxable property for property tax purposes in *any* taxing jurisdiction.

We note that the determination of which assets are subject to property taxation and which assets are not subject to property taxation is typically found in state statutes. This discussion is not intended to provide a legal interpretation of any particular state statutes.

Rather, this discussion of which assets are subject to property taxation and which assets are not subject to property taxation is presented from a valuation perspective and not from a legal perspective. Taxpayers should consult with legal counsel for legal instructions regarding which taxpayer assets are subject to property taxation in any particular taxing jurisdiction.

The 0 Percent Tax Rate Assumption Results in Investment Value—Not Market Value

Many states assess ad valorem tax based on the taxable asset's fair cash value, market value, true value, or some other similar market-derived standard of value. "All of these definitions have come to mean the price at which a property will sell from a willing seller to a willing buyer, both cognizant of all pertinent facts and neither being under duress."[11]

This value definition is similar to the typical fair market value definition that is used for many other valuation purposes, such as valuations prepared for federal income tax, federal gift or estate tax, bankruptcy, or commercial financing purposes.

The standard of value called investment value, on the other hand, can be defined as "The value of

a property interest to a particular investor or class of investors based on the investor's specific requirements. Investment value may be different from market value because it depends on a set of investment criteria that are not necessarily typical of the market."[12]

When a taxpayer unit valuation is performed using the market value standard of value (or some other similar standard of value), the subject valuation variables (e.g., income and expense, discount rate, and capitalization rate) should represent the requirements of the typical market participants. That is, the market-derived valuation variables should not be the actual financial variables associated either with the subject taxpayer or with the subject property.

It follows that if a particular jurisdiction seeks to estimate the market value of a subject taxpayer unit, then the NOI subject to capitalization should incorporate a market-derived income tax rate. The appropriate market-derived income tax rate is often measured as the typical market participant's marginal income tax rate (e.g., 35 to 40 percent)—or the industry-average income tax rate (again, e.g., 35 to 40 percent).

However, the income tax rate should not be the specific taxpayer's actual tax rate, particularly if that actual tax rate is an extreme tax rate such as 0 percent or 50 percent.

A market-derived income tax rate is the appropriate tax rate to use to estimate NOI in a unit valuation intended to estimate market value. This is because such a market-derived rate represents the income tax rate that market participants would use to estimate the NOI of the subject unit of operating assets.

According to the textbook *Appraisal of Real Estate*, "If an opinion of market value is sought, the income forecast should reflect the expectation of market participants. In an assignment to develop an opinion of investment value, the appraiser may base the income forecasts on the specific ownership or management requirements of the investor."[13]

In addition, and as further explained below, a market-derived income tax rate should be used to estimate the after-tax discount rate or capitalization rate. The selection of both a market-derived NOI estimate and capitalization rate (both calculated from a market-derived income tax rate) are necessary if the unit valuation objective is a market value estimate.

A second concern related to using either a temporary or company-specific income tax rate for property tax valuation purposes is that it does not treat similar taxpayers equally.

According to *Property Taxation*, "Taxes are said to be 'equal and uniform' when no person or class of persons in the taxing district, whether it be a state, county, city, town or village is taxed at a rate different from other persons in the same district upon the same value or the same thing, and where the objects of taxation are the same, by whomsoever owned or whatsoever they may be."[14]

"A market-derived income tax rate is the appropriate tax rate to use to estimate NOI in a unit valuation intended to estimate market value."

The process of applying different income tax rates for different taxpayers (to calculate either NOI or a capitalization rate) results in (1) unit values that are not uniformly or consistently estimated and (2) property tax assessments that are not performed in an equal and uniform manner among taxpayers. The desire for consistency and uniformity is why the generally accepted procedure used to estimate the taxpayer normalized NOI (and the capitalization rate) is to apply a consistent market-derived income tax rate for all similarly situated taxpayers in the jurisdiction.

The use of a 0 percent tax rate assumption (to calculate either the normalized NOI or the capitalization rate) results in an investment value for the subject taxpayer unit. That is, that taxpayer-specific income tax rate assumption results in the value of that taxpayer to that taxpayer.

The use of a taxpayer-specific income tax rate assumption does not result in the value of that taxpayer to a typical market participant. That is, the use of a taxpayer-specific (instead of a market-derived) income tax rate assumption does not result in the market value of the taxpayer unit.

Mismatching the Income Stream and the Capitalization Rate

When applying the direct capitalization methodology of normalized NOI divided by an after-tax direct capitalization rate, the direct capitalization rate and the NOI should be stated on the same income tax basis. That is, both valuation variables in this income approach valuation analysis should be stated on either a pretax basis or an after-tax basis.

Based on the 0 percent tax rate assumption, the income that is capitalized (i.e., the normalized NOI)

is effectively a pretax measure of income. However, the direct capitalization rate is calculated as an after-tax rate of return. Therefore, by using a 0 percent tax rate for the calculation of NOI but not for the calculation of the capitalization rate, the pretax NOI that is capitalized is mismatched to the selected after-tax capitalization rate.

It is not appropriate to capitalize a pretax income stream using an after-tax capitalization rate.[15] The resulting mathematical conclusion is not a meaningful value indication.

According to the textbook *Cost of Capital, Applications and Examples*, "A very common type of error in applying the income approach to valuation is to use a discount or capitalization rate that is not appropriate for the definition of economic income being discounted or capitalized. . . . If the entity being valued is subject to entity-level income taxes, then it is inappropriate to apply the cost of capital estimated by those methods to pretax return flows."[16]

This valuation error—mismatching the tax level of the NOI and the direct capitalization rate—overstates the indicated value of the taxpayer NOI and, consequently, overstates the taxpayer unit value estimated from the income approach. The amount of the value overstatement approximately equals the market-derived tax rate that is appropriate to estimate the taxpayer NOI. That is, if the appropriate taxpayer tax rate is 35 percent, then (1) the taxpayer NOI will be overstated by 35 percent and (2) the concluded income approach taxpayer unit value will also be overstated by 35 percent.

NOL Carryforward Risk Factors

An NOL carryforward (or any similar income tax attribute) may not be subject to property taxation in a taxing jurisdiction that assesses real estate and tangible personal property. However, if a taxing jurisdiction did assess property tax on a taxpayer's NOL carryforward (or similar tax attribute), that jurisdiction should consider all of the risk factors that influence the market value of the NOL.

This discussion only considers the value of a taxpayer's NOL carryforward. This discussion does not consider a taxing authority's statutory right to assess a property tax on a NOL carryforward.

Estimating the value of a taxpayer's NOL carryforward based on the above market value definition requires the analyst to consider the expected sale price of the NOL in a hypothetical transaction. Therefore, the first step in such an analysis is to consider the feasibility of a sale of a taxpayer NOL carryforward.

Although an NOL carryforward is not transferable by itself, an NOL may be a valuable component of a sale of a target company's stock. According to "Don't Ignore a Target's NOLs: The Price and Structure of Your Deal Can Depend on Them," "NOL carryforwards may be of significant value to certain buyers."[17] This journal article suggests, however, that "if the issue [of NOLs] does arise in price negotiations, buyers often argue that the market price for NOLs is 'pennies on the dollar.'"[18]

Three risk factors that may cause the buyer of the taxpayer company to discount the value of an NOL in price negotiations are: (1) regulatory restrictions such as the Internal Revenue Code Section 382 ("Section 382") limitation, (2) the amount and timing of the NOL carryforward economic benefit, and (3) the accuracy of the amount of the reported NOL carryforward.[19] Each of these factors increases the risk that the buyer of the taxpayer company will not be able to entirely benefit from the target company's NOL carryforward.

Factor 1—Regulatory Restrictions

There are several circumstances where a taxpayer company may not be able to fully use its NOL carryforward. The following list includes four restrictions on the use of the NOL carryforward that are described in the article, "Net Operating Losses: How Much Are These 'Assets' Really Worth?":[20]

- Section 269. This section disallows the corporate acquirer's use of an NOL carryforward when an acquisition's principal purpose is income tax avoidance.
- Separate Return Limitation Year (SRLY) Limitations. The SRLY limitations restrict which entity can use the company's NOL carryforward. Generally, the SRLY limitations prevent profitable corporate acquirers from using the NOL carryforward of a loss target company acquiree.
- Section 382. This section imposes an annual limitation amount on the corporate acquirer's use of the target NOL carryforward. The Section 382 NOL use limitation is triggered by ownership changes in the loss target corporation.
- Section 384. This section limits a corporate acquirer from offsetting its NOL against any taxable gain of a target company acquiree.

The above-listed four restrictions relate to the uncertainty surrounding the eventual economic benefit associated with the use of an NOL carryforward based on statutory provisions included in the

Internal Revenue Code and associated Treasury Regulations. As a result of these restrictions, a taxpayer's NOL carryforwards "represent the **potential** future tax savings as the result of past operations and, thus, **may** provide future cash flow benefits in the form of lower future tax costs. However, realization of deferred tax assets is subject to considerable **uncertainty** [emphases added]."[21]

Two of these statutory provisions are particularly relevant in a market value valuation analysis of a taxpayer's NOL carryforward for property tax purposes: (1) the SRLY rules and (2) the Section 382 limitation.

The SRLY Rules

The SRLY rules apply if a corporation with an NOL carryforward is acquired by, and becomes a member of, a consolidated group. In general, "the SRLY rules limit the consolidated group's use of separate return limitation year losses to the amount of income generated by the acquired corporation after it becomes a member of the group (the SRLY limitation)."[22]

This SRLY limitation controls how the corporate acquirer can use the target company NOL carryforward with respect to the acquirer's other subsidiaries. This SRLY restriction decreases the value that the corporate acquirer of the loss company would place on the target company NOL carryforward.

However, Treasury Regulation 1.502-21 states that the SRLY limitation does not apply if the consolidated group is subject to the Section 382 limitation (discussed below). Therefore, in an acquisition of 100 percent of a taxpayer company stock (which would trigger the Section 382 limitation), a corporate acquirer would be more concerned with the application of the Section 382 limitation than with the SRLY rules.

Section 382 Limitation

The Section 382 limitation reduces the value a corporate acquirer would place on a target company NOL carryforward. "In general, the Section 382 limitation limits the extent to which a target corporation that experiences an 'ownership change' may offset taxable income in any post-change taxable year by pre-ownership change NOLs."[23]

The Section 382 NOL use limitation applies after an "ownership change." There are two types of ownership change that can trigger the Section 382 NOL income offset limitation: (1) an ownership change involving one or more 5 percent loss company shareholders and (2) any tax-free reorganization of the loss company (with a few exceptions).

In either case, a 5 percent loss company shareholder must have increased his or her ownership percentage in the loss company by more than 50 percent (over his or her lowest pre-change ownership percentage) within three years of the ownership change event.

When an ownership change occurs, the Section 382 limitation equals (1) the fair market value of the old loss corporation multiplied by (2) the long-term federal tax exempt rate. This limitation on the use of an NOL carryforward applies to any post-change year.

Let's return to our illustrative taxpayer. Let's further assume that 100 percent of the LossCo common stock was sold on the January 1, 2015, assessment date. Let's also assume that (1) the LossCo common stock equity value equals $12 million on the date of the ownership change and (2) the long-term federal tax exempt rate equals 2.3 percent.[24]

Based on these assumptions and the Section 382 limitation, the maximum amount of acquirer company annual income that could be offset in any post-change year is approximately $280,000 ($12 million multiplied by 2.3 percent, rounded).

Since an NOL carryforward has a maximum 20-year carryforward period, no more than $5.6 million (calculated as $280,000 multiplied by 20 years) of the LossCo NOL carryforward would be available for use after an ownership change. This $5.6 million figure represents a $4.4 million permanent reduction compared to the total reported amount of the LossCo NOL carryforward.

However, the amount of the NOL carryforward that is not ultimately used in this example could exceed $4.4 million due to the time value of money. This is because the annual limitations could force the corporate acquirer to delay the use of the LossCo NOL carryforward. The following example illustrates this point.

Let's modify the above scenario and assume that (1) 100 percent of the LossCo common stock was sold for $22 million (instead of $12 million); (2) the Section 382 limitation equals $500,000 (based on the modified sales price); and (3) all other facts are unchanged.

As noted above, the LossCo projected 2015 taxable income is $1 million. Assuming an ownership change did not occur and the Section 382 limitation did not apply, LossCo could use its existing NOL carryforward to reduce all of the projected 2015 taxable income.[25]

If an ownership change took place and the Section 382 limitation did apply (a hypothetical unit sale is an assumption in the market value standard of value), then LossCo could only reduce $500,000 ($22 million multiplied by 2.3 percent, rounded) of

the projected taxable income instead of $1 million without the Section 382 limitation.

Based on these assumptions, (1) without being subject to a Section 382 limitation, LossCo could use $1 million of its NOL carryforward each year for 10 years or (2) if an ownership change occurred and triggered the Section 382 limitation, LossCo could use $500,000 of its NOL limitation each year for 20 years.

Given these two alternative income shelter scenarios, it is obvious that the $1 million/10-year income shelter use is more valuable than the $500,000/20-year income shelter use. The difference between these two income shelter scenarios is that the loss company is moving $500,000 of NOL use from year 1 to year 11, $500,000 of NOL use from year 2 to year 12, and so on until $500,000 of the NOL use is moved from year 10 to year 20.

The $1 million/10-year income shelter is more valuable because an investor/corporate acquirer would always prefer to receive a dollar in year 1 over a dollar received in year 11.

The risk that a loss company will benefit from its existing NOL carryforward is not limited to the existing Treasury Regulations. That is, the company also faces the risk related to future statutory, judicial, or administrative changes in the Internal Revenue Code or related Treasury Regulations. Such changes could alter how a current NOL carryforward balance may be used in the future.

Factor 2—Amount and Timing of Projected Economic Benefit of the NOL

"Perhaps the most significant factor impacting the value of NOL carryforwards is the probable amount and timing of future taxable income."[26] When analyzing this factor, the corporate acquirer will consider the target company (i.e., the loss company) projected taxable income. This amount of taxable income projection will inform the corporate acquirer as to if and when the NOL carryforward may be used.

This taxable income analysis performed by the corporate acquirer will also consider the target company projected taxable income subsequent to the acquisition transaction. This analysis may include consideration of buyer-specific post-acquisition synergies (which may not be relevant in a fair market value analysis) or other buyer-specific projections related to the target company.

For example, the corporate acquirer may consider if the target company will sell certain operating assets after the transaction, or if the target company is expected to be more profitable as a result of the transaction. These factors will affect the corporate acquirer's ability to realize a benefit from the target company NOL carryforward after a transaction.

Because of the time value of money, an NOL carryforward is more valuable the sooner that it can be used. If the target company is not expected to earn a meaningful amount of taxable income for several years after the transaction date, or if the amount of future income is highly uncertain, then the corporate acquirer may not place much value on its ability to benefit from the target company NOL carryforward.

The corporate acquirer will also consider if it can use the target company NOL carryforward to reduce the income of its other subsidiaries or lines of business. In certain situations, "tax law permits the NOLs of the target corporation . . . to be used to offset the future taxable income of not only the target corporation, but also the future taxable income of other members of its consolidated group of corporations (even if they were not consolidated at the time that the loss was originally incurred)."[27]

The SRLY rules discussed above limit how the acquirer corporation consolidated group subsidiaries can use the NOL carryforward of an acquired loss company.

Factor 3—Accuracy of the Reported NOL Balance

The third factor that a hypothetical corporate acquirer of a loss company would be concerned with is the amount and accuracy of the reported NOL carryforward balance. The amount of confidence that the corporate acquirer places in the accuracy of the reported NOL carryforward balance varies with the amount of (1) corporate acquirer due diligence and (2) loss company seller representations, both of which will necessarily include some risk of being inaccurate.

This risk of reported NOL carryforward balance accuracy is due to the fact that the corporate acquirer will have limited time and resources to conduct its due diligence. Also, the loss company seller will not be willing to absorb all of the risk related to the accuracy of the reported NOL balance. An NOL carryforward has up to a 20-year carryforward period, and the loss company seller will not want to be exposed to transaction-related liability for that long of a time period.

The corporate acquirer confidence in the accuracy of the reported NOL will be related to the value it places on the NOL carryforward. That is, the more confident the corporate acquirer is in the quality of the reported NOL balance, the more the acquirer will be willing to pay to acquire the loss company. This risk of uncertainty of the amount of the NOL carryforward balance is mitigated (but not

eliminated) when the target loss company provides audited financial statements.

This uncertainty risk is not eliminated with audited financial statements. This is because the loss company is still subject to an Internal Revenue Service audit. That is, upon audit, the Service may propose adjustments to the amount of the loss company NOL carryforward.

Perpetuity Assumption for the NOL Carryforward

All three previously discussed factors affect the market value of the taxpayer's NOL carryforward and all three factors should be considered in any valuation of the taxpayer NOL-related expected economic benefit.

None of those three factors are specific to the valuation method used to assess the taxpayer's total unit (which may include any value attributed to the taxpayer NOL carryforward). If the taxpayer unit value is estimated using an income approach valuation method that incorporates the 0 percent tax rate assumption, the analyst should also consider if and how the income tax rate selected to estimate the taxpayer NOI accounts for the NOL balance.

In the direct capitalization method, (1) the taxpayer NOI represents normalized income in the period following the valuation date and (2) the direct capitalization rate is typically measured as the discount rate minus the NOI expected long-term growth rate. This valuation method assumes that the taxpayer NOI will increase or decrease in perpetuity at a constant rate of change.[28]

If an income stream based on a 0 percent tax rate is capitalized, the analyst is assuming (either implicitly or explicitly) that the economic benefit of the taxpayer NOL carryforward will be available to the taxpayer in perpetuity.

The actual maximum carryforward period for an NOL is 20 years. Therefore, an NOL carryforward (and the associated economic benefit) has a *finite life*, and not an infinite life.

The direct capitalization valuation method is a perpetual life formula—it treats any economic benefit as a perpetuity economic benefit. And, the economic benefit of a taxpayer NOL carryforward does not have a perpetual life. Therefore, it is inappropriate to capitalize the economic benefit associated with the NOL carryforward when performing the direct capitalization procedure in an income approach unit valuation analysis.

It is a procedural error to incorporate a limited life economic benefit stream (of any nature) into a direct capitalization method analysis.

This error of including a limited life economic benefit in a perpetuity valuation model is demonstrated in *Cost of Capital: Application and Examples*:

> When using a constant growth (i.e., Gordon Growth) model to estimate terminal value at the end of the discrete forecast period, the formula calls for the normalized net cash flow in the terminal year to be grown at the expected long-term growth rate and divided by the capitalization rate. . . . Because the constant growth model assumes growth in perpetuity, any elements of the net cash flow that will not be growing over time or have a **finite life** need to be removed from the net cash flow and **valued separately**. Examples of such finite life items include . . . **[t]ax-loss carryforwards** [emphases added].[29]

The valuation guidance provided in the above-mentioned textbook is based on the fact that income or expense items that will not continue into perpetuity (such as an NOL carryforward economic benefit) should not be capitalized as a perpetuity in an income approach analysis. Rather, such a limited life economic benefit should be valued separately from the taxpayer's unlimited life economic benefits.

Furthermore, according to the textbook *Investment Valuation*, "It is good practice to assume that the tax rate used in perpetuity to compute the terminal value will be the marginal tax rate. . . . To the extent that tax planning or deferral caused this payment [of income taxes] to be very low (low effective tax rates) or very high (high effective tax rates), we run the risk of assuming that the firm can continue to do this in the future if we do not adjust the net income for changes in the tax rates in future years."[30]

The economic benefit that a taxpayer will enjoy from its NOL carryforward is temporary. It is simply inappropriate for an analyst to assume that any loss company will benefit from its NOL carryforward into perpetuity.

To the extent there is any limited life economic benefit, this economic benefit should be valued separately (based on a yield capitalization analysis) and then added to (or subtracted from) the direct capitalization analysis (that was calculated without the specific economic benefit).

Alternatively, the analyst could simply use the yield capitalization method to value the subject taxpayer. In that yield capitalization analysis, the

analyst could consider the specific finite life of each of the taxpayer economic benefits.

An income approach method that capitalizes the entire economic benefit related to the taxpayer NOL carryforward (i.e., a method that assumes a 0 percent tax rate) is not reasonable based on the limited life of any NOL carryforward. This valuation error overstates the taxpayer NOI. And, therefore, such a fundamental valuation error overstates both the concluded taxpayer value and the value of any taxpayer tax attributes (such as an NOL carryforward).

Valuation of a Taxpayer NOL Carryforward

In the valuation of loss companies (i.e., and not just of the loss company's real estate or tangible personal property), the value of an NOL carryforward tax attribute is often estimated using one of two valuation methods.

Using the first NOL tax attribute valuation method:

1. The subject loss company is valued without any consideration of the NOL carryforward
2. The value of the NOL tax attribute is separately estimated.
3. The loss company concluded value equals the sum of the step one value and the step two value.[31]

Using the second NOL valuation method, the loss company is valued using an income approach yield capitalization method. In this analysis, the estimated income tax rate changes over the income projection period until the NOL carryforward is no longer available.[32]

A detailed explanation of these two NOL economic benefit valuation methods is beyond the scope of this discussion. However, we are unaware of any valuation textbook, journal article, judicial decision, or conference presentation that supports the valuation of an NOL carryforward economic benefit using the 0 percent tax rate assumption.

The LossCo NOL Carryforward Economic Benefit

Let's consider the impact (if any) of the NOL carryforward economic benefit on the value of our illustrative loss company taxpayer, LossCo. As previously discussed, the market value of a loss company NOL carryforward is limited by at least three factors: (1) the expected timing and amount of future taxable income, (2) statutory NOL use restrictions, and (3) the risk related to the amount and accuracy of the reported NOL carryforward balance.

A hypothetical corporate acquirer of the LossCo common stock equity would consider each of these three NOL use limitations when determining the value attributable to the subject loss company NOL carryforward.

If the LossCo unit value is estimated (1) using an income approach direct capitalization method; (2) based on after-tax NOI calculated assuming a 0 percent tax rate (due to the LossCo NOL carryforward); and (3) using an after-tax direct capitalization rate, then the concluded value will represent the value of all of the LossCo operating assets, both tangible and intangible.

In addition, the unit value conclusion will include a perpetuity value attributed to the LossCo NOL carryforward. In fact, this concluded LossCo unit value will also overstate the value attributed to the LossCo NOL carryforward tax attribute. This is because the unit value increment does not consider the risk factors or the erroneous perpetuity assumption discussed herein.

Let's assume that (1) the LossCo after-tax NOI is estimated at $1 million, (2) the NOI is calculated assuming a 0 percent income tax rate (i.e., pretax NOL and after-tax NOL are the same in this example), and (3) the direct capitalization rate is estimated at 12 percent. Using these assumed valuation variables, the indicated LossCo unit value is $8.3 million, calculated as $1 million divided by 12 percent.

Let's further assume that the same hypothetical valuation variables as presented in the prior paragraph, except that the LossCo after-tax NOI is estimated using a 35 percent tax rate. Using these revised valuation variables, the indicated LossCo unit value is now $5.4 million, calculated as $1 million multiplied by (one minus the 35 percent tax rate) divided by 12 percent.

The indicated value difference between using the 0 percent tax rate assumption and the 35 percent tax rate assumption is $2.9 million (or a 35 percent value difference). This $2.9 million value component represents the implied LossCo value attributed to the NOL carryforward. Based on this value increment, over one-third of the LossCo total value is created by the LossCo NOL carryforward tax attribute.

That is, using the direct capitalization valuation method the amount of the value attributed to the NOL carryforward tax attribute will equal the difference between (1) the normalized tax rate without the NOL and (2) the normalized tax rate with the impact of the NOL.

The 0 percent tax rate assumption also ignores the other LossCo deferred income tax assets and liabilities that may affect the future LossCo income tax expense. As noted above, an NOL carryforward is just one component of the LossCo net deferred income tax asset (or liability) account.

When all other components of this balance sheet account are considered in the aggregate—including the LossCo NOL carryforward—LossCo actually reported a net deferred income tax liability of $1 million as of December 31, 2014. A deferred income tax liability "represents the increase in taxes payable in future years as a result of taxable temporary differences existing at the end of the current year."[33]

Based on the December 31, 2014, LossCo net deferred income tax liability position, the company may actually receive little or no economic benefit from its NOL carryforward. And, the future LossCo income tax expense may be greater than what would be calculated based on its marginal income tax rate. This risk factor, which is caused by the interaction of all of the LossCo tax attributes (in addition to NOL carryforward tax attribute), is not considered by using the 0 percent tax rate assumption.

Using a 0 percent tax rate assumption to estimate the LossCo unit value results in a substantial value increment being created by the LossCo NOL carryforward tax attribute. This value increment represents over one-third of the total value in the above direct capitalization method example.

This LossCo unit value indication is overstated because (1) it does not consider the tax attribute risk factors described above and (2) it incorrectly assumes that the NOL carryforward has a perpetual life.

Conclusions and Recommendations

Based on the analyses summarized above:

- A taxpayer's NOL carryforward tax attribute (and any other individual income tax attribute) should not be subject to property tax in a jurisdiction that only assesses real estate and tangible personal property.
- A taxpayer's NOL carryforward tax attribute is one of many individual income tax components that comprise the taxpayers deferred income tax asset or liability account; only this deferred income tax account in its entirety should be considered in the taxpayer unit valuation in a jurisdiction where the taxpayer NOL is subject to property tax.
- The use of the 0 percent tax rate assumption results in the investment value of the taxpayer unit, and not the market value of the taxpayer unit. Such a taxpayer-specific tax rate assumption is not a market-derived valuation variable.
- The use of the 0 percent tax rate assumption inappropriately capitalizes a pretax income stream by reference to an after-tax direct capitalization rate.
- The use of the 0 percent tax rate assumption inappropriately concludes that the taxpayer NOL carryforward has an independent market value that is equal to the expected future reduction in the taxpayer income tax expense.
- The use of the 0 percent tax rate assumption inappropriately assumes that the taxpayer company will never pay any income taxes at any time in the future.

"... analysts (and taxing authorities) should exclude the NOL carryforward tax attribute from the taxpayer unit value conclusion."

The effect of these procedural and conceptual errors, taken individually or cumulatively, is to (1) overstate the taxpayer total unit value and (2) overstate the value of the taxpayer NOL carryforward tax attribute.

Based on these observations, analysts (and taxing authorities) should exclude the NOL carryforward tax attribute from the taxpayer unit value conclusion. This exclusion is particularly appropriate in a jurisdiction that only assesses real estate and tangible personal property.

In order to exclude the value of a taxpayer's NOL carryforward from an income approach unit valuation method, the analyst (and the taxing authority) should calculate the taxpayer's NOI based on a market-derived income tax rate rather than using the 0 percent tax rate assumption. Often, a market-derived income tax rate is the typical market participant's marginal tax rate or an industry average effective income tax rate. However, it is not a taxpayer-specific income tax rate (particularly if the taxpayer-specific income tax rate is aberrational—such as 0 percent).

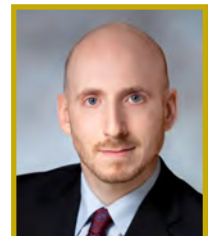
Alternatively, if the taxpayer NOL carryforward is subject to property tax in the taxing jurisdiction and the taxpayer unit value is estimated using an income approach valuation method, then:

1. the taxpayer NOI should be calculated using a market-derived income tax rate (e.g., 35 percent) in order to estimate the market value of the unit excluding the value of the NOL carryforward and
2. the NOL carryforward should be separately valued based on a generally accepted NOL valuation method with consideration of the tax attribute risk factors and finite carryforward life discussed above.

Even in a jurisdiction that assesses all taxpayer assets, no one individual tax attribute should disproportionately influence the taxpayer total unit value. Rather, the analyst (and the taxing authority) should consider the entirety of the taxpayer's tax attributes. The interaction of all taxpayer tax attributes determines the balance in the taxpayer's deferred income tax asset (or liability) account. And, such a taxpayer deferred income tax asset (or liability) account balance is already presented on the taxpayer's GAAP-based balance sheet.

Notes:

1. Robert F. Reilly and Robert P. Schweihs, *Guide to Property Tax Valuation* (Chicago: Willamette Management Associates, 2008), 19.
2. See, for example, *Guide to Property Tax Valuation*, 23–24.
3. Donald E. Keiso, Jerry J. Weygandt, and Terry D. Warfield, *Intermediate Accounting*, 5th ed. (New Jersey: John Wiley & Sons, 2013), 1132.
4. *Dictionary of Real Estate Appraisal*, 5th ed. (Chicago: The Appraisal Institute, 2010), 159.
5. Ibid., 145–146.
6. Ibid., 193.
7. *Black's Law Dictionary*, 9th ed. (St. Paul, MN: West, 2009), 1337.
8. Ibid.
9. Ibid, 1338.
10. We note that many valuation textbooks consider cash and other financial assets to be a component of intangible personal property. See, for example, Robert F. Reilly and Robert P. Schweihs, *Guide to Intangible Asset Valuation*, revised ed. (New York: American Institute of Certified Public Accountants, 2014), 15.
11. *Property Taxation*, 3rd ed., (Atlanta: Institute for Professionals in Taxation, 2004), 113.
12. *Dictionary of Real Estate Appraisal*, 105.
13. *The Appraisal of Real Estate*, 14th ed. (Chicago: The Appraisal Institute, 2103), 464.
14. *Property Taxation*, 1–2.
15. Shannon P. Pratt and Roger J. Grabowski, *Cost of Capital: Applications and Examples*, 5th ed., (New Jersey: John Wiley & Sons, 2014), 1188.
16. Ibid., 1187–88.
17. Thomas W. Bottomlee, Jason S. Bazar, and Arthur C. Walker, "Don't Ignore a Target's NOLs; The Price and Structure of Your Deal Can Depend on Them," *The M&A Journal* 9, no. 7 (2009).
18. Ibid.
19. Ibid.
20. Anthony H. Catanach Jr. and Shelley C. Rhoads-Catanach, "Net Operating Losses: How Much Are These "Assets" Really Worth?" *Commercial Lending Review* 21, no. 4 (Jul/Aug 2006): 14.
21. Ibid.: 18.
22. Mary Fung, "Calculating the Section 382 Annual Limitation: A More Relevant Task for Consolidated Groups," http://www.us.kpmg.com/microsite/tax/ma_insider/2001-1/stories/article04.htm.
23. Ibid.
24. The long-term tax exempt rate as of May 2015, as stated in Rev. Rul. 2015-8.
25. This example makes the simplifying assumption that the NOL could be used as a deduction for the entire projected LossCo taxable income. The actual amount of the NOL that could be used as an income shelter could be different due to difference between book and tax income, income that cannot be offset by an NOL, or other factors.
26. Bottomlee, Bazar, and Walker, "Don't Ignore a Target's NOLs."
27. Ibid.
28. For a discussion of the direct capitalization method valuation formula, see Pratt and Grabowski, Cost of *Capital: Applications and Examples*, Part 1: Cost of Capital Basics.
29. Pratt and Grabowski, *Cost of Capital: Applications and Examples*, 1196.
30. Aswath Damodaran, *Investment Valuation: Tools and Techniques for Determining the Value of Any Asset*, 3rd ed. (New Jersey: John Wiley & Sons, 2012), 252.
31. Tim Koller, Marc Goedhart, and David Wessels, *Valuation, Measuring and Managing the Value of Companies*, 4th ed. (New Jersey: John Wiley & Sons, 2005), 337–38.
32. Damodaran, *Investment Valuation*, 252–55.
33. Donald E. Kieso, Jerry J. Weygandt, and Terry D. Warfield, *Intermediate Accounting*, 15th ed. (New York: John Wiley & Sons, 2013), 1120.



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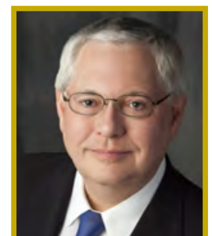

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