TREE APPRAISAL: CAN DEPRECIATION FACTORS BE RATED GREATER THAN 100%?

by Scott Cullen

Abstract. Generally accepted tree appraisal methods set forth in the *Guide for Plant Appraisal* employ Species, Condition, and Location adjustment percentage factors. It is sometimes suggested that these factors may be rated greater than 100% in order to reflect a value greater than replacement cost. This article examines this proposition and concludes that while appealing in its apparent simplicity, the proposition is conceptually unsupported, confusing, and unnecessary. Alternatives are offered and citations are provided.

Key Words. Appraisal; depreciation; tree appraisal; valuation.

Generally accepted tree appraisal methods set forth in the *Guide for Plant Appraisal* employ Species, Condition, and Location factors to adjust estimates of replacement cost (CTLA 2000). In some cases—for example, historic or income-producing trees—the indication of value provided by replacement cost may be lower than other facts suggest. It is sometimes suggested that to reflect value in these cases the adjustment factors can be rated greater than 100%. While this idea is not proposed or discussed in the literature, it is often discussed at industry-sponsored tree appraisal workshops and in Internet forums. This article considers whether this is a supportable or useful technique.

APPRAISAL TERMS AND METHODS

Appraisal is the estimation of monetary value (Black 1990; Appraisal Institute 1993; Appraisal Foundation 2002). Value is broadly defined as the present worth of future benefits (Appraisal Institute 1993).

Approaches to Value

There are three traditional "approaches to value" that rely on different sorts of data to provide "indications of value" (Smith and Belloit 1987; Appraisal Institute 1993; CTLA 2000; Appraisal Foundation 2002). The Cost Approach relies on replacement "cost" data. The Sales Comparable or Market Approach relies on historical "prices" in exchange. The Income or Benefits Approach relies on net income or benefits data after the deduction of "expenses." Appraisers are careful to distinguish cost, price, value, and expense. The terms are not interchangeable (Appraisal Institute 1992, p 17).

Cost Approach

The Cost Approach is more accurately described as the Depreciated Replacement Cost Approach. The theory underlying the approach is that the utility or benefits inherent in an object are replaced or reproduced by replacing or reproducing the object. The cost of replacement or reproduction, therefore, provides an indication of value (Smith and Belloit 1987; Appraisal Institute 1993, p 81; CTLA 2000, p 21; Cullen 2000). Replacement cost is the "current cost" or "cost new" (Smith and Belloit 1987; Appraisal Institute 1993; CTLA 2000; Appraisal Foundation 2002) to the owner of the appraised object to replace or reproduce the object at the time of appraisal. "Historical cost," or "book value," or "cost basis" (Appraisal Institute 1993), whether related to the original acquisition of the appraised object or a provider's expenditures to make the replacement available, is not considered in the Cost Approach. Replacement cost is related to production (that is, to constructing or assembling a new replacement) and must be distinguished from a "price" in exchange (Cullen 2000).

Depreciation

Replacement cost does not necessarily equal value (Appraisal Institute 1992, p 17; CTLA 2000, p 93; Cullen 2000). To provide the Cost Indication of Value, the initial replacement cost estimate is depreciated—that is, reduced (Appraisal Institute 1992; CTLA 2000, p 21; Appraisal Foundation 2002)—to reflect any difference in the benefits that would flow from a new, idealized replacement compared to an older or otherwise imperfect appraised object in a particular situation.

Appraisal depreciation, sometimes called accrued depreciation, is defined as "a loss in property value [as indicated by replacement or reproduction cost] from

any cause" (Smith and Belloit 1987, p 217; Appraisal Institute 1993; Appraisal Foundation 2002). An alternative definition is "the difference between replacement or reproduction cost and value" (Appraisal Institute 1993, p 4, p 96; Appraisal Foundation 2002). Although the latter definition might appear to allow depreciation to be an addition to cost (Cost + Depreciation = Value), the treatment of depreciation in the literature makes it clear that depreciation is a downward or negative adjustment to cost (Cost – Depreciation = Value). The sources consistently use language such as "loss" (Appraisal Institute 1992, p 343; Appraisal Institute 1993, p 96; Appraisal Foundation 2002), "cost less depreciation" (Smith and Belloit 1987, p 9; CTLA 2000, p 93), "cost is reduced by … depreciation" (Smith and Belloit 1987, p 166), "[cost] is reduced by" (Pennsylvania-Delaware Chapter ISA 1993, p 9), "deduct from cost" (Smith and Belloit 1987, p 217; Appraisal Institute 1992, p 343), and "depreciation is subtracted" (CTLA 2000, p 21). No references to using depreciation to increase value above cost were found in the appraisal literature.

Appraisal depreciation is not the same as accounting depreciation. Accounting depreciation is defined as "an allowance made against the loss in value of an asset for a defined purpose" [such as creating a replacement reserve or tax reporting] (Appraisal Institute 1993, p 96). For tax purposes in the United States, it is a noncash, deductible expense that allows an owner to "write off" a capital investment over time (CFR 2002; IRS 2001, NYU no date; USC 2001). As contrasted to appraisal depreciation, accounting depreciation is typically taken against historical or book costs (although some accounting systems employ current or replacement cost (Appraisal Institute 1992, p 344; White House 1998). The literature clearly distinguishes appraisal depreciation from accounting depreciation.

TREE APPRAISAL METHODS

The most common tree appraisal methods—Replacement Cost Method (RCM), Trunk Formula Method (TFM), and Cost of Cure Method (COC)—are depreciated replacement cost approaches to value (CTLA 2000, p 57*ff*; Cullen 2000). These methods recognize three tree appraisal depreciation factors: Species, Condition, and Location.

Ratings are assigned for these factors in the form of a percentage between 0% and 100% (CTLA 1992; CTLA 2000; Cullen and Hayner 2000). These ratings are used to reduce the initial cost estimate to reflect the value of the appraised tree in the particular situation. For example, if the rating is 60%, then the depreciation deduction is intended to be 40% of replacement cost. A rating of 100% means that no depreciation is intended.

The Species, Condition, and Location factors have evolved through various editions of industry tree appraisal guides. It was not always clear, however, that their methodological purpose is depreciation. The three factors were identified as depreciation and explained in an appraisal context in the article "Tree appraisal: What is the trunk formula method?" (Cullen 1997). The factors have been explicitly defined as depreciation in subsequent industry appraisal guides (Minnesota Society of Arboriculture 1999, p v; CTLA 2000, p 21, p 25*ff*).

The great appeal of depreciated replacement cost approaches (RCM, TFM, COC) for tree appraisal is that they provide a straightforward surrogate for the other approaches (Cullen 1997, 2000). "The cost approach is particularly important when a lack of market activity limits the usefulness of the sales comparison approach and when the [objects] to be appraised are not amenable to valuation by the income capitalization approach" (Appraisal Institute 1992, p 316). With regard to the sales comparable approach, irreplaceably large trees are not market goods in and of themselves; there are few model surveys in the literature that attempt to isolate tree values as a component of real estate fair market values, and such surveys are beyond the reasonable scope of the appraisal of an individual tree. With regard to the income approach, the income or benefits provided by a tree are seldom explicitly quantified in monetary terms; application models that attempt to do so are just emerging and have not been designed as appraisal tools. (Cullen 1997, 2000)

A TREE APPRAISAL PROBLEM

Tree appraisers may find situations wherein an indication of value provided by a replacement cost estimate (using RCM, TFC, or COC) is lower than what other facts suggest value should be. Examples include historic or feature trees and rare or unusual specimens (CTLA 1986, p 24; CTLA 1992, p 43; CTLA 2000, p 53); special-use properties such as arboreta and botanical gardens (Barborinas et al. 2000; Flatley et al. 2000); trees that provide particular benefits or enjoyment to an owner or user; or trees that specifically con-

tribute to the revenue stream of an income-producing property (Evans and Malone 1991; Relf 2001).

When value is less than replacement cost, depreciation is used to reduce the cost and provide a useful indication of value. There is, however, no direct mechanism in replacement cost approaches to increase the initial indication of value if value exceeds replacement cost. This is an inherent limitation of a replacement cost approach.

The problem is how to accurately and supportably reflect value if it exceeds replacement cost.

CAN DEPRECIATION FACTORS BE RATED GREATER THAN 100%?

It is sometimes suggested that rating Species, Condition, or Location factors greater than 100% might be a useful technique to provide a value indication greater than replacement cost. There is an obvious appeal in this technique: A simple numerical adjustment indeed results in a calculated value greater than replacement cost. In fact, it presents a number of specific problems.

Ratings Greater Than 100% Are Conceptually Unsupported

Tree appraisers must remember that the Species, Condition, and Location factors are used to apply depreciation and that depreciation is a downward adjustment to replacement cost. Using depreciation to increase replacement cost above actual costs, whether by adding an absolute amount or by applying a rating greater than 100%, is conceptually unsupported.

It is sometimes suggested that a rating greater than 100% is simply "appreciation." Appreciation [in value] is defined as an "increase in market value of an asset (e.g., real estate) over its value at some earlier time" (Black 1990). While appreciation can be measured from period to period (that is, compared to current, adjusted book value), it is frequently measured over initial acquisition or historical cost. In either case, appreciation is any positive difference between a past cost and current value. Appraisal depreciation has no "appreciation" counterpart. Therefore, there can be no appreciation in replacement cost.

Similarly, it is sometimes suggested that a rating greater than 100% could be described as "positive depreciation" in that it would make a positive or upward rather than negative or downward adjustment to replacement cost. A search of the literature found at least two uses of "positive depreciation" with entirely different meanings. One described an amount or rate of depreciation not equal to zero (Liebowitz and Margolis, no date), and another described the beneficial aspects of accounting depreciation for business entities (Powell 2000). No usage was found that supports depreciation ratings greater than 100%.

Tree appraisers must recognize that creating or employing methods, procedures, or techniques that are neither generally accepted nor conceptually supported may have negative consequences that more than offset any perceived advantages. Even if a rating greater than 100% can be hidden in the arcana of the current methods, it would do little for the credibility of the discipline if it cannot be explicitly explained and supported upon challenge. Peskin and de los Angeles (no date) provide worthwhile guidance: "Of course, accounting structures need not rely totally on economic theory. Structures can be justified on grounds of convenience, convention, tradition, or even arbitrary decisions of the moment. However, the advantage of a theoretical justification is that it helps assure that the structure is complete and logically consistent."

Ratings Greater Than 100% Require a Non-Cost Factual Basis

If the appraiser were to assign a rating greater than 100%, it would (or at least should) have some factual basis. Since replacement cost is already at 100%, the basis would have to be in other facts. Say, for example, that a rating of 125% is assigned. This suggests that the appraiser understands—through facts—that replacement cost is only 80% of value (100% ÷ 125% = 80%) or, alternatively, that replacement cost is 20% less than value (25% ÷ 125% = 20%). Without this understanding of value from other indications, the appraiser would be guessing about how much greater than 100% the rating should be.

Ratings Greater Than 100% Are Confusing and Unnecessary

First, the appraiser must remember that the essence of the approach is that replacement cost provides an indication of value. If the indication of value in fact comes from non-cost data, it would be confusing to bury any such data in a manipulation of replacement cost simply to increase the value indication. Second, the appraiser should recognize that at this point the

exercise of creating a rating greater than 100% (say 125% as in the preceding example) is not even necessary. It would be a wasted step, since the appraiser already understands that value exceeds replacement cost and has some indication of how much it exceeds replacement cost. It would be more straightforward (as well as conceptually supported and descriptive of the actual facts) to make a separate, additional adjustment (Cullen 1997, 2000) to the indication of value that results from the replacement cost exercise.

SUPPORTABLE SOLUTIONS

Since ratings greater than 100% are unsupported, the appraiser must consider other solutions to the problem. The possible solutions start within traditional replacement cost methods.

Accurately Reflect All Replacement Costs

In some cases, additional—even extraordinary—costs that can actually replace or reproduce benefits can be included in the replacement cost estimate and result in a reliable indication of actual value. These might include unusual search, acquisition, or transportation costs (CTLA 2000, p 66), preparation of restoration plans (CTLA 2000, p 80), extraordinary establishment costs for large plants (CTLA 2000, p 67), and so forth. The key is for the appraiser to recognize and include all appropriate replacement costs.

This discussion applies only to the value of the appraised tree(s) or plant(s). In damage cases, the appraiser must distinguish site restoration and clean-up costs, damage to hardscape, and other costs that are additional damages, not plant value.

Deduct Smaller Depreciation Amounts

If the indication of value is insufficient after accurately reflecting all costs, it may be possible to increase Species, Condition, or Location ratings up to 100%. For example, if a typical tree in a particular setting would be given a Location rating of 60%, but it has historic significance, the Location rating might be increased to reflect historic value. The same sort of adjustment might be made to the Species rating (CTLA 1986, p 24).

It might be argued that all three ratings could be increased, but that could have the effect of distorting the factual analysis. If, for example, a historic tree is in poor physical condition, assigning a high Condition rating suggests it is in better condition than is supported by the facts.

Depreciation factors afford the flexibility to accommodate many situations. The ratings for these factors are not fixed or restricted to narrow ranges by the *Guide for Plant Appraisal* or its regional supplements but are variable over the entire range from 0% to 100%, based on factually supported and justifiable appraiser judgment.

Apply Another Approach to Value

Value may still exceed replacement cost after reflecting all costs and increasing all three ratings to 100%. The ratings might even be 100% to start with, thus allowing no further increase. A replacement cost approach may not provide a useful indication of value if the benefits inherent in the appraised property are not replaced by the available replacement for which cost is estimated. A replacement cost approach may be inappropriate if the property is not replaceable or reproducible and the only alternative is to buy an existing property with the desirable characteristics (Smith 1987, p 165) or if the desirable characteristics can only be fully reproduced after an "undue delay" of perhaps many years (Appraisal Institute 1992, p 317). In this case, the appraiser must move beyond a traditional replacement cost approach.

An ideal solution is to apply a complete Sales Comparable or Income approach to value. For example, if the assignment involves an entire collection of plants or a site with a feature or historic tree as its principal characteristic, a qualified real estate appraisal might be undertaken using sites that are comparable in all respects but lacking the unusual plant(s), and a premium for the plant(s) could be assumed. Alternatively, if sites with unusual plants can be appraised, they can be compared to typical sites and the premium can be extracted. If income (which when capitalized will exceed replacement cost) can reliably be attributed to a tree or trees, it will provide a superior indication of value.

In practical terms, this solution may not be possible. There may not be data to support either approach (at least not for a complete estimate of value), and there are not readily applicable Sales Comparable or Income methods available to tree appraisers.

Employ Non-Cost Facts to Make Separate, Additional Adjustments

Facts other than replacement cost must support an opinion that replacement cost is insufficient to reflect value. If these facts do not support a complete valuation by another approach, the appraiser may be limited to making an adjustment to the replacement cost indication of value (Cullen 1997, 2000).

It is important to distinguish this separate, additional adjustment from an increase in replacement cost. The appraisal should clearly identify actual, depreciated replacement costs and the resulting value indication. This is the strongest part of the appraisal because it is based on the clearest facts. It might be characterized as the minimum value. If the adjustment is accomplished by a rating greater than 100%, the value indication is related only to replacement cost, and the real source of the increase is obscured. If, on the other hand, there is a separate, identified adjustment, the source of the increase is clear.

For example, a tree is assigned 100% Species, Condition, and Location ratings and has a replacement cost of x. The tree has historic significance and there is a component of value related to that history that will not be replaced with another tree. Facts reveal that it will cost y over the remaining life of the tree to bus school children to another historic site 50 miles away. Value is $x + y$.

Or the landscape value of another 100% tree can be replaced with a similar variety for a cost of a. But the only other seed-bearing specimens of the identical variety are on another continent and cannot be transplanted. It will cost b to purchase and transport seeds from those other specimens for use in an ongoing pharmaceutical research program. Value is $a + b$.

Another 100% tree is extremely rare. It can be replaced with a similar but less rare tree for q. It can be replaced with a different tree of similar rarity for $2q$. The last known specimens of the very same tree were recently acquired by a botanical garden, also for $2q$ each. Value is $(2)q$. This adjustment might be described as a "multiplier."

Adjustments of this sort might be explicit and made with great confidence if they are based on clear facts. They might be merely implied or suggested as possible additions to the minimum, replacement cost indication of value if the facts are less clear.

CONCLUSION

The most common tree appraisal methods are depreciated replacement cost approaches to value. In some cases, depreciated replacement cost is insufficient to indicate actual value. While appealing for their apparent simplicity, depreciation ratings greater than 100% are a conceptually unsupported, confusing, and unnecessary technique for providing a value indication greater than replacement cost. Superior, supportable techniques are available: Accurately reflect all replacement costs; deduct smaller depreciation amounts; apply complete Sales Comparable or Income approaches, if possible; or employ non-cost facts to make separate additional adjustments to the depreciated replacement cost indication of value.

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Résumé. Les méthodes généralement acceptées d'évaluation monétaire des arbres et qui sont mises de l'avant dans le Guide d'évaluation des végétaux d'ornement emploient les facteurs d'espèce, de condition et de localisation ajustés en fonction de pourcentages. Il est parfois suggéré que ces facteurs puissent avoir une valeur supérieure à 100% afin de refléter une valeur plus grande que celle de la valeur de remplacement. Cet article examine cette proposition et conclut que si cette solution semble très invitante dans son apparente simplicité, elle est néanmoins conceptuellement peu supportable, porte à confusion et non nécessaire. Des solutions alternatives sont offertes et des citations fournies.

Zusammenfassung. Allgemein anerkannte Methoden zur Baumerhebung aus dem Führer für Pflanzenaufnahme verwenden die Faktoren: Art, Zustand und Standortempfehlungen. Es ist manchmal angebracht, dass diese Faktoren größer als 100 % zu bewerten sind, um ihren größeren Wert gegenüber den Ersetzungskosten zu verdeutlichen. Dieser Artikel untersucht die Präpositionen und schließt damit, dass in der Anwendung seine sichtbare Komplexität vom Konzept her ununterstützt, verwirrend und unnötigt sind. Es werden Alternativen hier angeboten.

Resumen. Generalmente los métodos de valoración presentados en la Guía para Valoración de Plantas emplean Especie, Condición y Localización como factores de ajuste porcentual. Algunas veces se sugiere que estos factores puedan ser valorados más arriba del 100% con el fin de reflejar un valor mayor del costo de reemplazo. Este artículo examina esta propuesta y concluye que posiblemente se genere confusión innecesariamente. Se ofrecen algunas alternativas.