Best Practices Discussion

Applying the Cost Approach in the Fair Value Measurement of Intangible Assets

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A valuation analyst ("analyst") may be asked to perform intangible asset valuations for a variety of reasons. A fair value measurement for financial accounting (e.g., for purposes of intangible asset impairment testing or business combination acquisition accounting) is one reason why an analyst may be asked to value intangible assets. The cost approach is one of three generally accepted intangible asset valuation approaches. The cost approach may be particularly applicable to the fair value measurement of certain types of intangible assets. This discussion summarizes the best practices related to the application of the cost approach to intangible asset valuation, particularly in the context of a fair value measurement assignment.

Introduction

There are three generally accepted intangible asset valuation approaches: (1) the income approach, (2) the market approach, and (3) the cost approach.

Most valuation analysts ("analysts") are familiar with the income approach and market approach intangible asset valuation methods, such as the multi-period excess earnings method, the capitalized excess earnings method, the relief from royalty method, and the sales comparison method.

In comparison to real estate and tangible personal property appraisers, analysts often have less experience and training in the application of the cost approach to property valuation. Nonetheless, in many circumstances, the cost approach is particularly applicable to the fair value measurement of certain types of intangible assets.

This discussion combines a theoretical framework for the application of the cost approach with a number of illustrative examples. First, this discussion summarizes the various types of intangible assets and the general intangible asset valuation process. This discussion describes some of the reasons why an analyst may be asked to develop the fair value measurement of an intangible asset.

Second, this discussion explains the theory and application of the cost approach to a wide range of intangible asset valuation assignments. This discussion mentions errors and misconceptions that analysts may have with regard to the application of the cost approach.

Third, this discussion considers the application of the cost approach in fair value measurements developed for financial accounting purposes (i.e., Financial Accounting Standards Board ("FASB") Accounting Standards Codification ("ASC") Topic 820, *Fair Value Measurements*). This portion of the discussion includes guidance from the *Mandatory Performance Framework* ("MPF") related to the Certified in Entity and Intangible Valuations ("CEIV") credential.[1]

Finally, this discussion presents an illustrative example of the application of the cost approach to an intangible asset fair value measurement analysis.

Intangible Asset Overview

Many analysts have developed lists of intangible assets. However, there is no single universally recognized list of all intangible assets.

As defined in ASC Topic 350, *Intangibles—Goodwill and Other*, intangible assets are assets that have no physical substance. The value of an intangible asset is based on the rights or privileges to which the owner/operator is entitled. FASB ASC Topic 350 provides further definitions related to the recognition of an intangible asset.

ASC Topic 805-20-55 provides one list of intangible assets that analysts frequently refer to for fair value measurement and other financial accounting purposes. This list is intended to present the identifiable intangible assets that may be recognized for acquisition accounting purposes. The ASC Topic 805-20-55 list also illustrates the many different types of identifiable intangible assets for other purposes.

ASC Topic 805-20-55 organizes the list of identifiable intangible assets into the following five categories:

1. Marketing-related intangible assets
2. Customer-related intangible assets
3. Artistic-related intangible assets
4. Contract-based intangible assets
5. Technology-based intangible assets

The identifiable intangible assets included in each of the five ASC Topic 805-20-55 categories are presented in Exhibit 1.

The ASC Topic 805-20-55 list of identifiable intangible assets is not intended to be comprehensive. Rather, it is meant to provide a reasonable list of several types of intangible assets that an analyst may identify.

Similar to the many types of intangible assets, there are numerous reasons why an analyst may be asked to value an intangible asset. In the context of financial accounting, a fair value measurement is a typical valuation assignment.

The following discussion presents a nonexhaustive list of some of the financial-accounting-related intangible asset fair value measurement assignments.

- Preparing the acquisition accounting (i.e., transaction purchase price) allocation among acquired tangible assets and intangible assets (in compliance with ASC Topic 805, *Business Combinations*)
- Testing for goodwill impairment and for other intangible asset impairment (in compliance with ASC Topic 350, *Intangibles—Goodwill and Other* and ASC Topic 360, *Property, Plant, and Equipment*)
- Preparing the post-bankruptcy "fresh start" accounting for the emerging entity's tangible assets and intangible assets (ASC Topic 852, *Reorganizations*)
- Preparing valuations for investment company financial accounting (ASC Topic 946, *Financial Services—Investment Companies*)
- Valuing intangible asset investments owned by (and reported on the balance sheet of) a portfolio company

Again, the above list is not meant to be comprehensive. Rather, it is meant to provide a reasonable list of several types of fair-value-related intangible asset measurement assignments that an analyst may be asked to perform.

After being asked to develop the fair value measurement of any of the identifiable intangible assets described above, the analyst typically conducts due diligence and gathers data that will assist in the valuation process.

Before diving into the application of the cost approach to intangible asset fair value measurements, the following section discusses some helpful data gathering tools that the analyst may use during the course of the analysis.

Intangible Asset Valuation Process Data Gathering and Due Diligence

At the onset of the valuation engagement, the analyst typically performs due diligence with respect to the subject intangible asset. First, the analyst typically gathers and analyzes information related to the current owner/operator. The information typically relates to both the historical development and the current use of the intangible asset.

Such information typically includes the following:

1. The owner/operator's historical and prospective financial statements (related to the line of business or business unit that operates the intangible asset)
2. The owner/operator's historical and prospective intangible asset development and maintenance costs

Exhibit 1
FASB Accounting Standards Codification Topic 805-20-55
List of Identifiable Intangible Assets

Marketing-Related Intangible Assets

1. Newspaper mastheads
2. Trademarks, trade names, service marks, collective marks, and certification marks
3. Trade dress (unique color, shape, package design)
4. Internet domain names
5. Noncompetition agreements

Customer-Related Intangible Assets

1. Customer lists
2. Customer contracts and related customer relationships
3. Noncontractual customer relationships
4. Order or production backlogs

Artistic-Related Intangible Assets

1. Plays, operas, and ballets
2. Books, magazines, newspapers, and other literary works
3. Musical works such as compositions, song lyrics, and advertising jingles
4. Photographs and photographs
5. Video and audiovisual material including motion pictures or films, music videos, and television programs

Contract-Based Intangible Assets

1. License, royalty, and standstill agreements
2. Advertising, construction, management, service, or supply contracts
3. Operating lease agreements of a lessor
4. Construction permits
5. Operating and broadcast rights
6. Franchise agreements
7. Use rights such as drilling, water, air, timber, cutting, and route authorities
8. Servicing contracts such as mortgage servicing rights
9. Employment contracts

Technology-Based Intangible Assets

1. Patented technology
2. Computer software and mask works
3. Unpatented technology
4. Databases, including title plants
5. Trade secrets, such as secret formulas, processes, and recipes

3. Any current and expected owner/operator resource/capacity constraints (e.g., with consideration of raw materials, production, storage, distribution, sales, etc.)
4. A description of, and an estimate of, the intangible asset economic benefits to the current owner/operator. These economic benefits typically include the following components:
   - Any associated revenue increase (e.g., related product unit price/volume, market size/position)
   - Any associated expense decrease (e.g., expenses related to product returns; cost of goods sold; selling, general, and administrative; research and development)
   - Any associated investment decrease (e.g., inventory, capital expenditures)
   - Any associated risk decrease (e.g., the existence of any intangible asset licenses or contracts, a decrease of cost of capital components, the defensive use of the intangible asset)
   - Any assessment of the impact of the intangible asset on the owner/operator's strategic/competitive strengths, weaknesses, opportunities, and threats (i.e., a strengths, weaknesses, opportunities, and threats analysis)

The analyst may consider the market potential of the intangible asset outside of the current owner/operator. For example, the analyst may consider the following factors from the perspective of an alternative (e.g., a market participant in the context of a fair value analysis) owner/operator:

1. A change in the market definition or in the market size for an alternative owner/operator
2. A change in alternative/competitive uses of the intangible asset to an alternative owner/operator
3. The ability of the intangible asset to create inbound/outbound license opportunities to an alternative owner/operator
4. Whether the current owner can operate the intangible asset and also outbound license the intangible asset (in different products, different markets, different territories, etc.)

To the extent that the intangible asset is subject to an inbound or outbound license agreement (or other contract), the analyst may look for the more typical intangible contract terms. Many of the typical contract terms associated with an intangible asset use license or development/commercialization agreement are listed in Exhibit 2.

The analyst may also review and challenge (1) any owner/operator-prepared financial projections

Exhibit 2
Typical Contract Terms of an Intangible Asset License (or Other) Agreement

1. Licensor/licensee responsibility typical contract terms:
   - Identity of the licensor and the licensee
   - Term of the agreement (including any renewal options)
   - Intellectual property legal protection requirements
   - Amount and responsibility for research and development expenditures
   - Amount and responsibility for marketing, advertising, or other promotional expenditures
   - Responsibility to obtain and maintain any licenses, permits, or other regulatory approvals
   - Milestone dates for regulatory approvals, commercialization, sales levels, etc.
2. Other intangible asset license agreement typical contract terms:
   - Minimum use, production, or sales requirements
   - Minimum marketing, promotion, or commercialization expense requirements
   - Research and development technology development payments and development completion payments
   - Party responsible to obtain the required regulatory approvals
   - Milestone license payments
   - Rights to any future developments
   - Rights to sublicense

and (2) any owner/operator-prepared measures of intangible asset economic benefits.

In particular, the analyst may test the achievability of such financial projections and the reasonableness of such economic benefit measures against the owner/operator's actual historical performance, industry performance, guideline company performance, and other benchmark comparisons.

For example, the analyst may perform the following benchmark comparative analyses:

1. Compare any owner/operator prior-prepared financial projections to the owner/operator's actual historical results of operations
2. Compare any owner/operator current management financial projections to the owner/operator current capacity constraints
3. Compare any owner/operator current financial projections to the current total market size (i.e., demand, capacity, etc.)
4. Consider any published industry average comparable profit margin data for the industry in which the owner/operator competes
5. Consider selected guideline publicly traded company comparable profit margin data for the industry in which the owner/operator competes
6. Consider the quality and quantity of available guideline or comparable intangible asset license data for the industry in which the owner/operator competes
7. Perform a useful economic life ("UEL") analysis, with consideration of the following intangible asset life measurements:
   - Legal/statutory life
   - Contract/license life
   - Technology obsolescence life
   - Economic obsolescence life
   - Lives of prior generations of the subject intangible asset
   - Position of the subject intangible asset in its current life cycle

The analyst typically compares the owner/operator's historical and projected results of operations to the selected guideline publicly traded companies (described below). In addition, the analyst may also compare the owner/operator's results of operations to published industry data sources.

Exhibit 3 presents some of the published industry data sources that analysts may consider for these intangible asset benchmark comparative analyses.

The data sources included in Exhibit 3 allow the analyst to compare the owner/operator's financial results to benchmark industry expense ratios, profit margins, returns on investment, and the like. These comparisons can help the analyst to assess the reasonableness of:

1. the owner/operator's financial projections and/or
2. the owner/operator's assessment of any intangible asset economic benefits.

Exhibit 4 presents a list of automated databases that analysts can access to obtain information on

Exhibit 3
Industry Financial Ratio Data Sources That May Be Useful in the Intangible Asset Due Diligence

- The Risk Management Association—*Annual Statement Studies: Financial Ratio Benchmarks*
- FirstResearch—*Industry Profiles*
- IBISWorld—*Industry Reports*
- BizMiner (The Brandow Company)—*Industry Financial Profiles*
- CCH, Inc.—*Almanac of Business and Industrial Ratios*
- IndustriusCFO (formerly Fintel, LLC)—*Industry Average Ratios*
- MicroBilt Corporation (formerly IntegraInfo)—*Integra Financial Benchmarking Data*
- ValuSource—*IRS Corporate Ratios*
- Schonfeld & Associates, Inc.—*IRS Corporate Financial Ratios*
- S&P Capital IQ—*Industry Profiles*
- S&P Global—*Industry Surveys*
- Duff & Phelps, LLC—*Valuation Handbook: U.S. Industry Cost of Capital*

Exhibit 4
Database Sources That May Be Useful In the Intangible Asset Due Diligence Regarding Guideline Intangible Asset Owner/Operators

S&P Capital IQ—This database provides an equity screener in which one can screen by numerous criteria, including industry; business description; geographic location; financial data such as revenue, EBITDA, or assets; and closing price, to name a few. The database contains information on over 88,000 companies worldwide. Over 5,000 unique financial data items are provided. SEC filings and some foreign annual reports can be accessed directly from S&P Capital IQ. Analyst reports are also available for an additional fee. More information can be found at www.capitaliq.com.

Thomson ONE—This database provides an equity screener in which one can screen by numerous criteria, including industry; business description; financial data such as revenue, EBITDA, or assets; geographic location; and closing price, to name a few. The database contains information on over 70,000 companies worldwide. Analyst reports are also available on this database. More information can be found at www.thomsonone.com.

FactSet—This database provides an equity screener in which one can screen by numerous criteria, including industry; business description; financial data such as revenue, EBITDA, or assets; geographic location; and closing price, to name a few. The database contains information on over 73,000 companies worldwide. Over 2,000 unique financial data items are provided. More information can be found at www.factset.com.

Bloomberg Professional—This database provides an equity screener in which one can screen by numerous criteria, including industry; business description; financial data such as revenue, EBITDA, or assets; geographic location; and closing price, to name a few. The database contains information on every publicly traded US company and over 45,000 foreign companies. More information can be found at www.bloomberg.com/professional/.

MergentOnline—This searchable database contains information on over 35,000 active and inactive companies. Companies can be screened by industry; business description; financial data such as revenue, EBITDA, or assets; geographic location; and closing price, to name a few. More information can be found at www.mergentonline.com.

Pitchbook/BVR Guideline Public Company Comps Tool—This database includes information on all publicly traded U.S. companies. Users can screen using numerous criteria including industry; business description; financial data such as revenue, EBITDA, or assets; geographic location; and closing price, to name a few. More information can be found at www.bvmarketdata.com.

Hoovers—This database, owned by D&B, provides information on over 85 million private and public companies. Data availability varies widely depending on the size of the company and whether it is publicly traded or privately held. Researchers can screen on more than 70 search criteria. More information can be found at www.hoovers.com.

Sentieo—This database covers information on over 70,000 global equity securities. The platform allows for intelligent document search through millions of SEC filings, transcripts, and presentations for tens of thousands of publicly traded companies. More information can be found at www.sentieo.com.

TagniFi—This database primarily functions as a screening tool allowing users to perform customized searches for companies or transaction information. The database provides company financial information, identifies competitors and comparable companies, company news, and analyst estimates and recommendations for each company in its database. More information can be found at www.tagnifi.com.

individual owner/operator companies. These databases typically include information about both publicly traded companies and privately owned companies. These databases may be considered in the intangible asset due diligence process.

After completing the data gathering and due diligence, the analyst identifies the valuation approach (or approaches) to apply in that valuation assignment. The following sections describe the application of the cost approach, one of the three generally accepted intangible asset valuation approaches.

Overview of the Cost Approach

As mentioned above, there are three generally accepted intangible asset valuation approaches: the cost approach, the market approach, and the income approach. The analyst should consider all three approaches in an intangible asset fair value measurement and apply those approaches that are relevant to the facts and circumstances of the particular assignment. However, the application of the market approach and the income approach is outside the scope of this discussion.

The fundamental principle of the cost approach in the valuation of intangible assets is the economic principle of substitution. That is, the value of a fungible intangible asset may be influenced by the cost to create a new substitute intangible asset.

As discussed later, all cost approach methods apply a comprehensive definition of cost, including consideration of an opportunity cost during the intangible asset development stage. After considering all cost components, the value of the new substitute intangible asset should be adjusted (i.e., amortized or depreciated) in order to make the hypothetical new intangible asset comparable to the actual or "old" intangible asset.

Some analysts erroneously believe that the cost approach relies exclusively on historical information. For example, one analyst misconception related to the cost approach is that it should be based on the accounting book value of the reference asset measured as its historical cost adjusted for any accounting amortization or recognition of impairment.

Instead, it is important for analysts to recognize that cost approach valuation methods often include forward-looking estimates.

For example, the expected cost of a developing a new intangible asset typically involves estimates of developer's profit and entrepreneurial incentive, resulting in a value indication that has little resemblance to the historical-cost-based accounting book value of the subject asset as recorded on the owner/operator entity's balance sheet.

It is noteworthy that not all commercial intangible assets are fungible. Some intangible assets are unique and, therefore, cannot be actually replaced. However, a replacement cost analysis is a hypothetical analysis that assumes that the actual asset does not currently exist. Therefore, the cost approach may still be applicable to the valuation of certain unique intangible asset.

In the example of an intellectual property valuation, the analyst should note that the cost approach considers the cost to replace the utility of the actual intellectual property. The application of the cost approach assumes that the actual intellectual property does not already exist. Real estate appraisers call this assumption the greenfield premise. That is, the subject building is assumed not to exist, and the real estate appraiser faces an undeveloped greenfield (i.e., a vacant site).

In the intangible asset valuation, the replacement intellectual property provides the same utility as the actual intellectual property. Since the analyst assumes a greenfield, the hypothetical intellectual property does not infringe on actual intellectual property.

An FCC license may be an example of a fungible commercial intangible asset. A buyer may refuse to accept the seller's asking price for, say, an FCC broadcast license. Instead, the buyer can go to the marketplace (or to the FCC) and buy a perfectly identical substitute license. In this case, the cost of the alternative license is relevant to the fair value measurement of the FCC license intangible asset.

A patent is typically not a fungible intangible asset. A patent (by definition) is unique. A buyer cannot go to the marketplace and buy a perfectly identical substitute patent. There is only one subject patent, and it is registered with the U.S. Patent and Trademark Office.

Let's assume a subject patent. The buyer may buy a functionally similar patent. Or, the buyer can develop a new noninfringing invention. Let's assume this noninfringing invention may result in a substitute patent. A perfectly identical substitute patent would, by definition, infringe on the actual patent.

However, the cost approach application should consider the cost to create a noninfringing substitute with the equivalent utility to the actual patent. Therefore, the cost approach may still be applied in an intellectual property valuation, although it may have certain application limitations.

Cost approach methods are especially suitable for the fair value measurement of a recently developed intangible asset. In the case of a relatively new intangible asset, the owner/operator's development cost and development effort data may still be available (or may be subject to an accurate estimation).

Cost approach methods are also applicable to the valuation of an in-process intangible asset and to a noncommercialized (defensive) intangible asset.

An example of a noncommercialized intangible asset is a patent or a trademark that is held

primarily for its strategic defensive use (i.e., so the owner's competitor cannot own or operate the subject intangible asset).

When applying the cost approach, the analyst should realize that the intangible asset value is not derived from the current cost measure alone. Rather, the intangible asset value is derived from the current cost measure (however defined) less appropriate allowances for all forms of depreciation and obsolescence.

As explained below, depreciation and obsolescence are defined valuation terms.

Reasons to Apply the Cost Approach

For the most part, the analyst's selection of the applicable intangible asset valuation approaches is a process of elimination. The analyst typically attempts to apply all approaches for which there are reliable data available.

If there are sufficient reliable data to perform all three property valuation approaches, then the analyst typically applies all three approaches. If there are only sufficient reliable data to perform two approaches, then the analyst typically applies those two approaches. If there are only sufficient reliable data available to perform the cost approach, then the analyst applies the cost approach only.

If there are insufficient guideline sale or license transaction data available, then the analyst may have to rely on the cost approach by default. If the subject intangible asset is not the type of asset that generates a measurable amount of income (however defined), then the analyst may have to rely on the cost approach by default.

Certain intangible assets particularly lend themselves to the application of the cost approach. Such intangible assets include the following:

1. Recently developed (i.e., relatively new) intangible assets
2. Intangible assets that are fungible or may be easily exchanged or substituted
3. Intangible assets for which the owner/operator's historical development cost data are still available
4. Intangible assets that are operated by an owner with the expertise to assist the analyst in the estimation of a current development cost
5. Intangible assets that are operated by an owner with the expertise to assist the analyst in the estimation of (a) a useful economic life ("UEL") and (b) obsolescence
6. Intangible assets that are used (or used up) in the production of income but which themselves do not produce any income; examples of such contributory intangible assets may include product formulae, employee or work station training/operator manuals, operating procedures, computer software, an assembled workforce, etc.; these intangible assets are sometimes referred to as "back room" intangible assets

In selecting the cost approach, the analyst should consider if there are sufficient reliable data available to estimate both:

1. the intangible asset current cost (e.g., replacement cost new or reproduction cost new) and
2. all forms of intangible asset depreciation and obsolescence (including economic obsolescence).

The estimation of obsolescence often involves an analysis of the intangible asset's UEL. The topic of UEL analysis is discussed in the following section.

Useful Economic Life Considerations

After the analyst has selected the appropriate intangible asset valuation approaches and methods, the next procedure is to consider the UEL. The estimation of the intangible asset UEL (often called a "lifing analysis") is an important consideration in each generally accepted valuation approach.

An asset's UEL is the total period of time over which an asset is expected to generate economic benefits. In estimating an intangible asset's economic life, analysts typically consider the financial projections of the subject entity (or asset), its industry, the economy or economies of the geographic regions in which the subject entity operates, and other market participants or competitors.[3]

In the cost approach, a lifing analysis may be performed to estimate the total amount of obsolescence, if any, from the estimated measure of "cost"—that is, the intangible asset reproduction cost new or replacement cost new.

For each valuation approach, the UEL analysis may have an impact on value. Normally, in the cost approach, a longer UEL estimate results in a greater intangible asset value. That is because a longer UEL

generally indicates less obsolescence in the intangible asset. Normally, a shorter UEL estimate results in a greater obsolescence allowance consideration in the intangible asset value.

The market should indicate an acceptance for the subject intangible asset's UEL. If the actual intangible asset's UEL is materially different from the guideline sale or license transaction UEL, then adjustments to the market-derived transactional pricing multiples (or other pricing metrics) should be considered.

If the actual asset's UEL is more than materially different from the guideline sale or license transaction intangible asset UELs, this fact may indicate a lack of marketability for the intangible asset. This fact may indicate a lack of market demand for an intangible asset with the intangible asset's age/life characteristics.

The following list presents some of the factors that the analyst may consider in the UEL analysis:

- Legal factors
- Regulatory factors
- Contractual factors
- Functional factors
- Technological factors
- Economic factors
- Analytical factors

The analyst typically considers each of these categories of life influence factors in the intangible asset's UEL estimation. Typically, the life factor that indicates the shortest UEL deserves primary consideration in the intangible asset UEL estimate.

Cost Approach Valuation Methods

There are several intangible asset valuation methods within the cost approach. Each valuation method uses a particular definition (or measurement metric) of cost.

Two of the cost measurement definitions are:

1. reproduction cost new and
2. replacement cost new.

Reproduction cost new ("RPCN") measures the total cost, in current prices as of the date of the analysis, to develop an exact duplicate of the actual intangible asset. The reproduction intangible asset is developed using the same materials, production standards, design, layout, and quality of workmanship as the actual intangible asset. The reproduction intangible asset includes all inadequacies, superadequacies, and obsolescence of the actual intangible asset.

Replacement cost new ("RCN") measures the total cost, in current prices as of the date of the analysis, to develop a new intangible asset having the same functionality or utility as the actual intangible asset. Functionality is an engineering concept that means the ability of the intangible asset to perform the task for which it was designed. Utility is an economics concept that means the ability of the intangible asset to provide an equivalent amount of satisfaction to the owner/operator.

The replacement intangible asset is developed using modern materials, production standards, design, layout, and quality of workmanship. The replacement intangible asset typically excludes all curable inadequacies, superadequacies, and obsolescence that may be present in the actual intangible asset.

There are other cost definitions that may also be applicable to a cost approach valuation. Some analysts consider a measure of cost avoidance as a cost approach method. This method quantifies either historical or prospective development costs that are avoided because the owner/operator already owns the actual intangible asset.

However, the cost avoidance method is more accurately categorized as an income approach method, rather than a cost approach method.

Some analysts consider trended historical costs as a cost approach measure. In this method, the historical development costs are identified and trended to the valuation date by the use of an appropriate inflation-related index factor.

This trended historical cost method is particularly applicable when (1) the actual intangible asset is relatively new or (2) the owner/operator has fairly complete records related to the historical development costs and efforts. In addition, the inflation-related trend index should be appropriate to the type of development costs that are being indexed to current costs.

Regardless of the specific cost definition that is applied in the cost measurement analysis, all cost measurement methods (including RPCN, RCN, or some other cost measurement) should consider a comprehensive cost analysis.

Cost Measurement Procedures

Any intangible asset cost measurement should consider the following four cost components:

1. Direct costs (e.g., materials, labor, and supplies)
2. Indirect costs (e.g., engineering and design expenses, legal and consulting fees)
3. The intangible asset developer's profit (e.g., a profit margin percent applied to the direct cost and indirect cost investment)
4. An opportunity cost/entrepreneurial incentive (e.g., a measure of lost income or other opportunity cost during the development period adequate to motivate the development process)

Usually, the intangible asset direct costs and indirect costs are relatively easy to identify and quantify.

The developer's profit component can be estimated using several generally accepted procedures. This cost component is often estimated as a percentage profit margin on the developer's investment in the material, labor, and overhead costs.

The entrepreneurial incentive component is often measured as either the lost income that the developer would experience during the intangible asset replacement/development period or a fair rate of return on the investment in the total intangible asset cost metric during the replacement/ development period.

The lost income concept of entrepreneurial incentive is often considered in the context of a "make versus buy" decision. For example, consider a hypothetical willing buyer and a hypothetical willing seller (i.e., the current owner) of a patent. Let's assume that it would require a two-year period for a hypothetical willing buyer to develop a replacement (e.g., new invention) patent.

If the buyer "buys" the seller's actual patent, then the buyer can start earning income from the actual patent (either operating income or ownership license income) immediately.

In contrast, if the buyer "makes" its own hypothetical noninfringing replacement patent, then the buyer will not earn any income (either operating income or ownership license income) from the replacement patent during the two-year replacement/development period. The two years of lost income during the hypothetical patent development period represents the opportunity cost of "making" (i.e., developing) a de novo, noninfringing replacement patent—compared to "buying" the actual patent.

All four cost components—that is, direct costs, indirect costs, developer's profit, and entrepreneurial incentive—should be considered in the intangible asset cost approach valuation. Therefore, while the cost approach represents a different set of analyses than the income approach, there are certain economic analyses that are included in the cost approach.

These economic analyses provide indications that either of these two related cost approach components should be measured as:

1. entrepreneurial incentive or lost income opportunity cost (if any) or
2. economic obsolescence or an inadequate return on investment (if any).

The intangible asset development cost new (however measured) should be adjusted for any value decreases due to:

1. physical deterioration,
2. functional obsolescence, and
3. external obsolescence.

Within the valuation profession's terminology, all types of physical deterioration and obsolescence are collectively referred to as depreciation. Depreciation is the valuation profession's terminology used for both tangible assets and intangible assets.

Physical deterioration is the reduction in property value due to physical wear and tear. It is unlikely, though not impossible, that an intangible asset will experience physical deterioration. Nonetheless, the analyst should consider the existence of any physical deterioration in a cost approach valuation analysis.

For example, physical deterioration may be considered in the cost approach valuation of a trained and assembled workforce (e.g., if some of the employees are nearing retirement age).

Functional obsolescence is the reduction in property value due to the inability of the intangible asset to perform the function (or yield the economic utility) for which it was originally designed.

The technological component of functional obsolescence is a decrease in value due to improvements in technology that make the subject intangible asset less than the ideal replacement for itself.

For example, in the valuation of computer software, if the software code is written in an obsolete programming language, then the software may suffer from functional obsolescence.

External obsolescence is a reduction in property value due to the effects, events, or conditions that are external to—and not controlled by—the current

use or condition of the intangible asset. The impact of external obsolescence is typically beyond the control of the owner/operator. There are two types of external obsolescence:

1. Locational obsolescence
2. Economic obsolescence

Location obsolescence is a decrease in the property value due to changes in the neighborhood conditions. This type of obsolescence typically affects real-estate-related intangible assets such as easements, drilling rights, air rights, construction permits or rights, environmental operating permits, water extraction rights, and the like.

Economic obsolescence relates to the inability of the owner/operator to earn a fair rate of return on investment ("ROI") related to the intangible asset. Economic obsolescence may affect most types of intangible assets. Economic obsolescence measurement is described in greater detail below.

Obsolescence of any type is considered curable if it would cost the owner/operator less to "cure" the inefficiency than the decrease in value caused by the inefficiency. Obsolescence of any type is considered incurable if it would cost the operator more to "cure" the inefficiency than the decrease in value caused by the inefficiency.

Let's say that an owner/operator uses an inefficient computer software intangible asset (say, it is written in an inefficient third generation language). It would cost $1,000,000 to reprogram the actual computer software in a more efficient fifth generation language.

The new software system would create savings to the owner/operator of both computer hardware and clerical support expense of over $1,000,000 (on a present value basis). Therefore, that intangible asset obsolescence is considered to be curable.

In any cost approach analysis, the analyst should estimate the amounts (if any) of intangible asset physical deterioration, functional obsolescence, and external (potentially economic) obsolescence. In this estimation of the components of valuation depreciation, the analyst may consider both (1) the expected UEL of the intangible asset and (2) the actual ROI of the intangible asset.

Figure 1 illustrates the consideration of direct and indirect costs (e.g., material and director labor) and developer's profit and entrepreneurial income in the cost approach valuation of a typical intangible asset. Figure 1 also considers the comparison of historical costs to current (i.e., valuation date) costs.

In Figure 1, the total historical direct and indirect costs are $100 when the intangible asset was originally developed in the year 2009. The total direct and indirect replacement costs are at $125 as of a 2020 valuation date.

Figure 1 also illustrates how the owner/operator does not typically consider the developer's profit or entrepreneurial incentive cost components—even if the owner/operator did keep track of the historical (e.g., year 2009) direct material and labor development costs. The year 2020 developer's profit and entrepreneurial incentive cost components (at $75) are then added to the year 2020 direct and indirect cost components (at $125).

The sum of all of these cost components (at $200) is the year 2020 RCN.

It is important to note that the cost components discussed above are typically viewed as capitalizable costs (or expenditures), and not period costs (or expenses). That is, as discussed further in a later section, the costs considered in the cost approach are not considered after-tax expenses, but instead considered capitalizable expenditures. Accordingly, there is typically no tax-affecting that should be applied to the cost components that are considered in the cost approach valuation analysis.

However, certain fair value measurements may be an exception to that concept and may incorporate a tax amortization benefit ("TAB") adjustment within the analysis (as discussed further below).

Figure 2 illustrates the relationships between RCN and replacement cost new less depreciation ("RCNLD"). In Figure 2, the intangible asset RCN is $200. This $200 figure is the same RCN estimate as concluded in Figure 1.

Depreciation is subtracted from the RCN in order to estimate the intangible asset current value (or RCNLD). The three depreciation components include physical deterioration (typically a de minimis consideration for an intangible asset), functional obsolescence, and economic obsolescence.

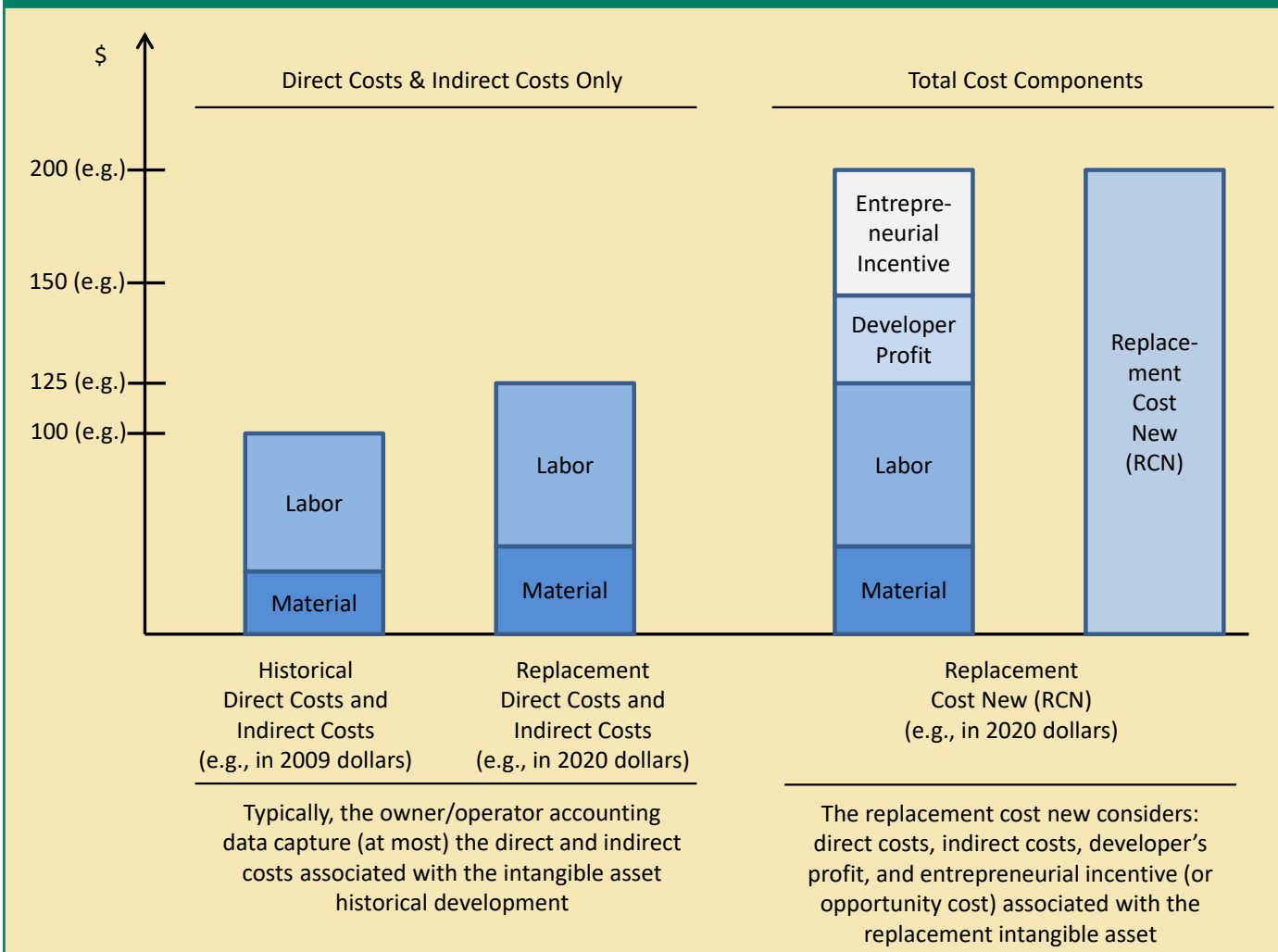
In Figure 2, the total of these three depreciation components is approximately $60. The intangible asset RCNLD is calculated as follows:

	$200 RCN
–	60 less depreciation ("LD")
=	$140 RCNLD

In Figure 2, the current value (or the RCNLD) of the subject intangible asset is illustrated to be approximately $140. The RCNLD (and not the RCN) provides the cost approach value indication.

A typical cost approach formula for quantifying intangible asset replacement cost new is as follows:

Figure 1
Comparison of Historical Cost to Replacement Cost New in the Intangible Asset Development Process



Reproduction cost new
– Incurable functional obsolescence
= Replacement cost new

To estimate the intangible asset value, the following cost approach formula may be applied:

Replacement cost new
– Physical deterioration
– Economic obsolescence
– Curable functional obsolescence
= Value

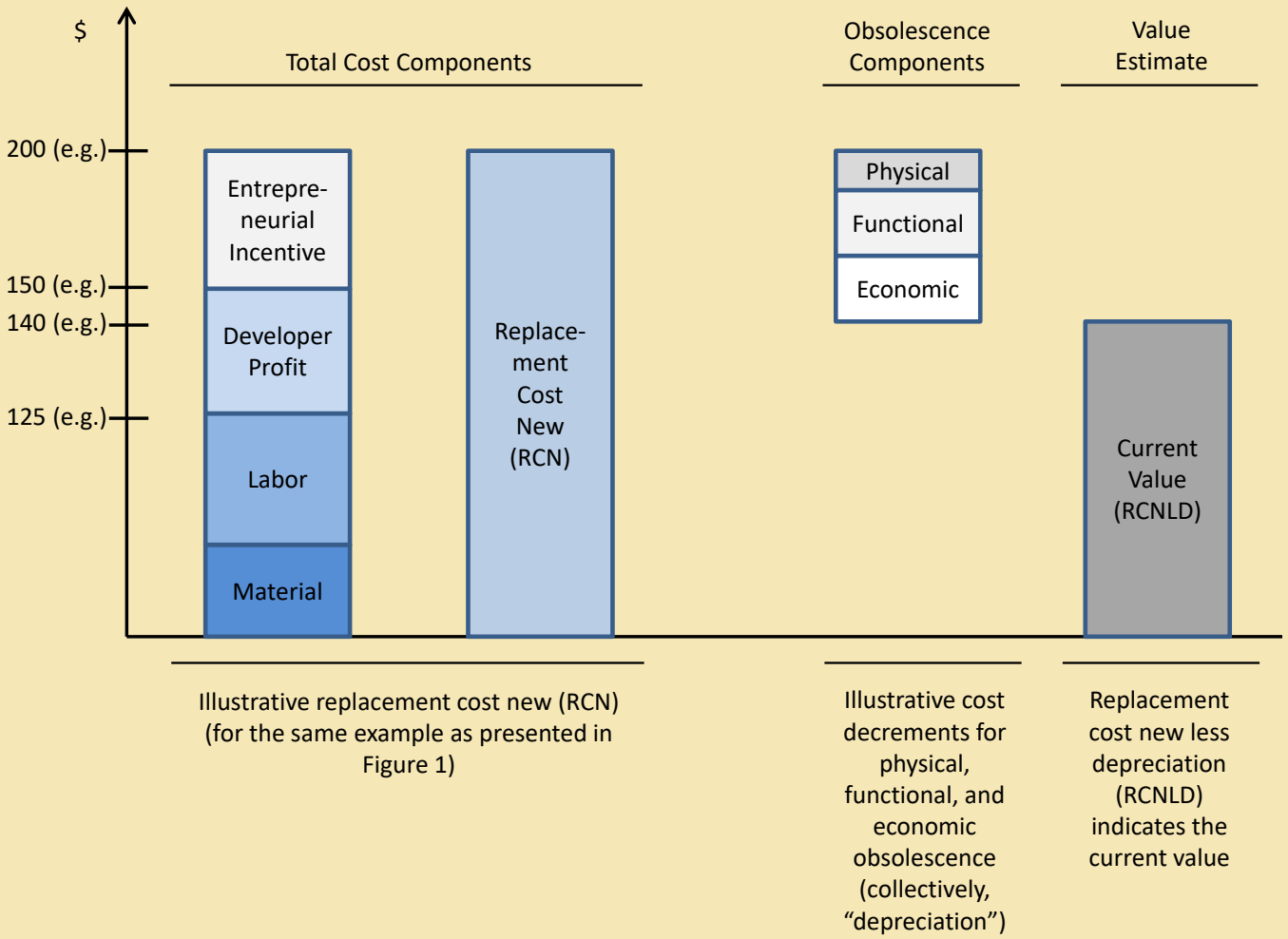
Obsolescence is curable if the cost to cure the intangible asset deficiency (e.g., the cost to re-write the obsolete computer software) is less than the cost of operating the deficient intangible asset (e.g., the cost of running multiple software programs that do not share a common database).

Obsolescence is incurable if the cost of curing the deficiency is more than the cost of operating the deficient intangible asset.

Physical Depreciation Measurement Procedures

There is no particular formula or equation to quantify physical depreciation (or deterioration). If possible, the analyst may physically inspect the intangible asset for any manifestation of physical deterioration. One procedure

Figure 2
Comparison of Replacement Cost New to Current Value in the Intangible Asset Development Process



related to quantifying the quantifying physical deterioration is to estimate the cost to cure the deterioration (if it is, in fact, curable).

Ultimately, intangible assets are typically not subject to wear and tear like tangible assets are. However, intangible assets can be "used up" over time. That is, the intangible asset's UEL may become shorter over time. This decrease in UEL may decrease the intangible asset value.

For example, an intangible asset that is contract-related or otherwise has a legal UEL will typically decrease in value as that UEL expires. Licenses, permits, contractual rights, agreements, franchises, and several types of intellectual property have legally determined finite lives. As that life expires, the value of that intangible asset typically decreases.

Let's assume that the cost to obtain a Food and Drug Administration ("FDA") license for a new drug product is, say, $10 million. That cost would include all drug development and laboratory work, all clinical tests, all application and documentation fees to the FDA, and a lost income/opportunity cost component during the drug development period.

Let's assume that the FDA license period for the drug is 10 years. On the date that the FDA license is granted, the intangible asset value probably equals the RCN of $10 million. Nine years later (with only one year remaining in the FDA license term), the intangible asset value will likely have decreased.

Even ignoring the effect of any economic obsolescence, the willing buyer will probably assume that it will soon need to incur all new drug

development costs in order to obtain a new FDA license for an improved drug product.

The analyst has to decide if the license value decrease is linear over the 10-year life. However, the intangible asset value typically decreases as the UEL decreases. The illustrative FDA license value at the end of year nine will be its RCNLD estimate, not its RCN estimate.

Some analysts may debate whether this value decrease should be called technological obsolescence instead of physical deterioration. Regardless of the terminology used, the analyst should recognize the decrease in the value of contract-related or regulatory-related intangible assets (and of many other types of intangible assets) as the UEL of each such asset decreases.

The analyst should realize that some types of intangible assets may actually experience physical deterioration. All intangible assets have some physical manifestation.

Even institutional goodwill may be manifested by the owner/operator entity's financial statements (historical or prospective), articles of incorporation, books and records, and so on. Personal goodwill may be manifested by personal income tax returns, compensation statements, employment or other contracts, client lists, and so on.

The physical manifestation of some intangible assets may experience wear and tear. For example, in an assembled workforce, some employees may become old (and ready to retire) or injured (and on disability leave). Laboratory notebooks and other technical documentation may be tattered over time. Non-CAD engineering drawings and designs or nonelectronic patient charts and records may show wear and tear over time.

The analyst should at least consider the occurrence of physical deterioration during the intangible asset valuation process.

Functional Obsolescence Measurement Procedures

For all assets, both tangible and intangible, functional obsolescence is usually related to inefficiencies associated with the operation of the asset. These inefficiencies typically involve either inadequacies or superadequacies.

An inadequacy occurs when there is not enough of the asset (e.g., the asset is too small) for it to operate efficiently. A superadequacy occurs when there is too much of an asset (e.g., the asset is too large) for it to operate efficiently.

With regard to functional obsolescence, two principal factors that the analyst typically considers are:

1. excess capital costs and
2. excess operating costs.

The consideration of excess capital costs may compare to the cost to develop a reproduction intangible asset today with the historical cost to develop the actual intangible asset. In other words, if it would cost less to develop the replacement intangible asset today than it did when the actual asset was created, then that difference is one measure of functional obsolescence.

The consideration of excess operating costs may compare the current cost of maintaining or using the intangible asset to the cost of maintaining or using the asset when it was first developed or put into service. The present value of any relative excess operating costs over the intangible asset's UEL is one measure of functional obsolescence.

A trained and assembled workforce is an example of an intangible asset that may experience functional obsolescence. If the workforce is too small to serve the owner/operator, then the entity may operate inefficiently. The work will not be adequately performed or it will not be performed on time. The owner/operator may incur overtime compensation expense in order to complete the work.

One way or another, the work flow will be inefficient or the customer demand will not be met, or the entity will incur excess operating costs (compared to the optimal workforce).

If the workforce is too large to serve the owner/operator, then the entity may also operate inefficiently. There will be employees standing around with little to do, or the employees will perform the available work slowly in order to appear busy.

The owner/operator will incur excess facilities overhead costs (e.g., rent, heat, electricity, etc.) to house the excess employees and excess costs related to wages, payroll taxes, employee insurance benefits, other employee benefits, and so on.

In addition to the wrong size, an assembled workforce can experience functional obsolescence related to the wrong mix of employees. For example, if the workforce includes employees who have inadequate skills or insufficient experience, then the work may be inadequately or inefficiently performed, or both. This situation, in turn, could negatively affect the business (e.g., poor quality control, high product return rate, loss of customer base, damage to reputation, etc.).

If the workforce includes employees who are too highly skilled or experienced, then the owner/operator could incur higher compensation expense (to pay the skilled employees) than is necessary to get the job done. Likewise, the overqualified employees may become frustrated with the less demanding work, and the owner/operator will experience a higher level of employee turnover (than it would with appropriately qualified employees).

As mentioned above, analysts often consider two methods for quantifying functional obsolescence:

- The excess capital cost method
- The excess operating cost method

Although it is called the excess capital cost method, this method can be applied to measure obsolescence related to either an inadequacy or a superadequacy. However, the excess capital cost method is more frequently applied to measure intangible asset superadequacy.

A specific description of the various methods an analyst may use to quantify functional obsolescence is outside the scope of this discussion. However, a later section of this discussion presents an example that illustrates the potential procedures an analyst may go through in order to estimate (1) the intangible asset cost components and (2) the various forms of intangible asset depreciation (e.g., functional obsolescence and economic obsolescence).

Economic Obsolescence Measurement Procedures

The analysis of economic obsolescence is typically the last procedure in any cost approach valuation analysis. This statement is as true for an intangible asset valuation as it is for a tangible asset valuation. The objective of the economic obsolescence analysis is to determine if the owner/operator can earn a fair rate of return on the intangible asset cost approach estimate.

If the owner/operator can earn a fair rate of return, then the cost approach estimate (before an economic obsolescence allowance) provides the intangible asset value indication. If the owner/operator cannot earn a fair rate of return, then the cost approach estimate has to be reduced—by the amount of the economic obsolescence allowance.

The cost approach estimate should be reduced to the level at which the owner/operator can earn a fair rate of return. The approach estimate adjusted for economic obsolescence results in the cost approach value indication.

Typically, it is fairly easy for the analyst to identify physical deterioration (if any) in the intangible asset. It is also fairly easy for the analyst to identify functional obsolescence (if any) in the intangible asset. This is because these forms of depreciation are inherent in the intangible asset.

Economic obsolescence is more difficult to identify than physical deterioration or functional obsolescence. Typically, the causes of economic obsolescence are external to the intangible asset.

The analysis of intangible asset economic obsolescence is typically a two-step process:

1. Identify the existence of economic obsolescence
2. Quantify the amount of economic obsolescence

Procedures to Identify the Existence of Economic Obsolescence

It is appropriate for the analyst to consider economic obsolescence in every cost approach valuation analysis. There are several conditions that may indicate the existence of economic obsolescence.

Exhibit 5 lists some of the conditions that may indicate the existence of economic obsolescence with regard to the intangible asset.

While none of these owner/operator conditions specifically measures the amount of economic obsolescence, the existence of one or more of these conditions may indicate the existence of economic obsolescence. In order to measure economic obsolescence, the analyst typically considers the following:

1. Owner/operator-specific factors
2. Industry factors

Procedures to Measure Economic Obsolescence

Most of the analyses performed to quantify economic obsolescence are performed on a comparative basis. The comparative basis may be (1) the owner/operator's actual operating results with the economic obsolescence effect compared to (2) the owner/operator's hypothetical (e.g., historical or projected) operating results without the economic obsolescence effect.

Alternatively, the comparative basis may be (1) the owner/operator's actual operating results "with" the economic obsolescence effect compared to (2) one or more comparable entity's operating results "without" the economic obsolescence effect.

Exhibit 5
Owner/Operator Conditions That May Indicate the Existence of Intangible Asset Economic Obsolescence

1. The entity's income approach value indication is less than the entity's asset-based approach value indication.
2. The entity's market approach value indication is less than the entity's asset-based approach value indication.
3. The owner/operator revenue has been decreasing in recent years.
4. The owner/operator profitability has been decreasing in recent years.
5. The owner/operator cash flow has been decreasing in recent years.
6. The owner/operator product pricing has been decreasing in recent years.
7. The industry/profession revenue has been decreasing in recent years.
8. The industry/profession profitability has been decreasing in recent years.
9. The industry/profession cash flow has been decreasing in recent years.
10. The industry/profession product pricing has been decreasing in recent years.
11. The owner/operator profit margins have been decreasing in recent years.
12. The owner/operator returns on investment have been decreasing in recent years.
13. The industry/profession profit margins have been decreasing in recent years.
14. The industry/profession returns on investment have been decreasing in recent years.
15. The industry/profession competition has been increasing in recent years.
16. The industry/profession has experienced regulatory changes in recent years.

Given the comparative nature of economic obsolescence analyses, a noncomparative analysis may not be adequate to allow the analyst to measure economic obsolescence.

The analyst may have to review the owner/operator's financial documents or operational reports in order to quantify many types of economic obsolescence.

These types of owner/operator documents may include the following:

- Financial statements or financial results of operations
- Financial budgets, plans, projections, or forecasts
- Production statements, production cost analyses, or operating cost variance analyses
- Material, labor, and overhead cost of goods sold (or services delivered) analyses
- Fixed versus variable expense operating statements
- Cost/volume/profit analyses
- Unit/dollar sales analyses or average selling price analyses

The analyst may consider the above-listed owner/operator data and documents on a comparative basis, such as the following:

- Actual results versus historical results
- Actual results versus budgeted results
- Actual results versus specific comparative entity results
- Actual results versus specific competitor results
- Actual results versus industry/profession average or benchmark results
- Actual results versus the owner/operator's practical or normal production capacity

The analyst may analyze owner/operator financial data in order to identify the causes of the obsolescence. Particularly with regard to intangible assets, the analyst may analyze business enterprise profit margins, business enterprise returns on investment, industrial/commercial product unit average selling price, industrial/commercial product unit cost of goods sold, or industrial/commercial product unit sales volume.

The analyst will look for some external factor that may cause the owner/operator to earn less than a fair rate of return on the intangible asset cost approach value indication.

A specific description of the various methods the analyst may use to quantify economic obsolescence is outside the scope of this discussion. However, a later section of this discussion presents an example that illustrates the potential procedures the analyst may go through in order to estimate:

1. the intangible asset cost components and
2. the various forms of intangible asset depreciation (e.g., functional obsolescence and economic obsolescence).

But first, the following sections describe some analyst errors and misconceptions with regard to the cost approach (particularly with regard to the TAB adjustment).

Income Tax Amortization Benefit Adjustment

There is a diversity of practice with regard to the application of the TAB adjustment as part of a cost approach valuation of an intangible asset. Some analysts apply the TAB adjustment to the cost approach valuation of intangible assets.

However, the application of the TAB adjustment is often inappropriate, and it is typical to exclude the TAB adjustment from a cost approach valuation analysis. This is because there are no income tax considerations (for amortization tax deductions or otherwise) in the application of the cost approach. This statement is true in the application of the cost approach to the fair value measurement of both tangible assets and intangible assets.

The direct costs and indirect costs that are included in any cost approach method cost measurement should be considered simply as expenditures. Those expenditures should not be considered as either a before-tax expense or an after-tax expense.

The cost approach recognizes costs to the hypothetical buyer or hypothetical seller. The cost approach does not consider expenses—as expenses would be recognized in other financial accounting purposes or income tax reporting purposes.

The costs included in the cost approach are expenditures that are paid to create an alternative (e.g., the replacement or the reproduction) intangible asset. Therefore, it is usually not appropriate to tax affect (or to consider any income tax considerations) related to such intangible asset development expenditures.

Effectively, there are no income tax considerations in the application of the cost approach. In contrast, income tax considerations are relevant to the application of the income approach to intangible asset valuation.

Such income tax considerations relate to both:

1. the measure of income subject to analysis and
2. the present value discount rate and the direct capitalization rate.

The Appraisal Foundation published *Appraisal Practices Board VFR Valuation Advisory 2: The Valuation of Customer-Related Assets* ("VFR 2"). VFR 2 states that, when applying the cost approach to estimate the fair value of customer-related intangible assets, "the costs estimated in this method are investment costs and not period costs, and therefore the conclusion of the cost approach should not be tax affected. Nor should the conclusion be adjusted for the TAB adjustment, as a pretax conclusion is consistent with an exit price that a market participant would receive for the asset."

The above-listed VFR 2 logic applies specifically to a fair value measurement of customer-related intangible assets. Nonetheless, the same VFR 2 logic is broadly applicable to the application of the cost approach to other intangible assets for other purposes.

The Application of the Mandatory Performance Framework for the Certified in Entity and Intangible Valuations Credential ("AMPF") also considers the topic of the TAB adjustment with respect to the application of the cost approach. AMPF states that a TAB adjustment should be considered when measuring the fair value of an intangible asset, but a TAB should only be applied when it is appropriate.

Specifically, AMPF states, "a TAB is generally considered appropriate when estimating the fair value of an entity using an income approach for a presumed taxable transaction. However, when the cost approach (unless a cost savings method) . . . is used, a TAB is not appropriate (a) under a non-taxable transaction, (b) when pre-tax costs are expended, or (c) when the price paid reflects the full fair value of the entity."[4]

Ultimately, if a "pretax" cost approach is used to estimate the value of an intangible asset, the addition of a TAB adjustment is typically not considered to be appropriate.

In contrast, the addition of a TAB adjustment is typically considered appropriate in the application of the so-called cost savings method (i.e., an income

approach valuation method to value an intangible assets).

The TAB adjustment is typically appropriate in the application of the income approach to value intangible assets. Effectively the TAB adjustment:

1. decreases the income tax expense related to the subject intangible asset income projections and
2. increases the after-tax income related to the subject intangible asset.

However, neither income tax expense nor after-tax income are components in the application of a cost approach fair value measurement.

In some applications of the income approach to intangible asset fair value measurement, it may be appropriate for the analyst:

1. to project a pretax income measure and
2. to apply a pretax discount rate or capitalization rate.

In some applications of the income approach to intangible asset fair value measurement, it may be appropriate for the analyst:

1. to project an after-tax income measure and
2. to apply an after-tax discount rate or capitalization rate.

In the latter instance (i.e., the after-tax analysis), the application of the TAB adjustment recognizes the temporary additional income tax deduction associated with the intangible asset amortization deduction.

Effectively, that additional amortization income tax deduction corrects the (temporarily) overstated pretax income projection related to the intangible asset. And, that additional amortization income tax deduction corrects the (temporarily) overstated effective income tax rate in the income approach analysis related to the intangible asset.

In other words, the TAB adjustment is made, in effect, to correct an artificially overstated projection of pretax income and an artificially overstated income tax rate that is applied in the unadjusted income approach analysis.

Nonetheless, there is no income tax component (implicit or explicit) in the cost approach analysis that needs to be adjusted due to the income tax amortization (or the lack thereof) of the subject intangible asset. This is because the cost approach considers capitalizable expenditures (i.e., intangible asset development costs), and not period expenses.

There is no pretax income or expense projection variables—and there are no effective income tax rate variables—applied in any cost approach valuation method. Therefore, there are no tax-related valuation variables to correct—or adjust—in the application of the cost approach to tangible asset fair value measurement or intangible asset fair value measurement.

As a simple analogy, let's consider an assignment to estimate the fair market value of a piece of industrial machinery (i.e., tangible personal property). In order to value that piece of machinery, the analyst may apply the cost approach—using the same (or a similar) methodology as previously discussed for the purpose of valuing an intangible asset.

Let's assume that the analyst estimates the RCNLD for the piece of machinery to be $600,000.

Let's assume that the tangible property owner/operator would pay the equipment manufacturer $1,000,000 for the new piece of machinery. That is, the equipment RCN would be $1,000,000.

Let's assume that the subject equipment is 4 years old and has a total expected useful life of 10 years. Assuming straight line useful life depreciation for the machinery, the subject equipment physical depreciation adjustment would be $400,000.

Again, for simplicity purposes, let's assume that the analyst concludes that there is no functional obsolescence or external (economic) obsolescence associated with the subject equipment.

Accordingly, the RCNLD related to the subject equipment would be $600,000 (i.e., $1,000,000 RCN minus $400,000 of physical depreciation equates to a $600,000 RCNLD).

In the valuation of that piece of machinery, the analyst would not further adjust the concluded RCNLD value indication for the present value of the income tax benefit the owner/operator will enjoy in the form of depreciation deductions on that piece of equipment over, say, a modified cost recovery system ("MCRS") depreciation period.

The analyst may recognize that, in fact, the owner/operator will be able to claim an annual income tax deduction related to the depreciation of the piece of machinery.

And, if an income approach method were applied to value that piece of machinery, it may be appropriate for the analyst to make an adjustment for the present value of the income tax benefit associated with those future depreciation-related income tax deductions.

However, since the cost approach was applied in this analysis, and since no income tax component is considered in the cost approach, it would be

inappropriate to take that depreciation tax benefit into account in the cost approach value conclusion for the subject equipment.

That example is analogous to an intangible asset valued by the application of the cost approach. Just as it is inappropriate to make an adjustment to the indicated RCNLD value for depreciation-related income tax deductions when applying the cost approach to value a tangible asset, it is similarly inappropriate to make an adjustment to the RCNLD value for amortization-related income tax deductions when applying the cost approach to measure the fair value of an intangible asset.

This clear distinction between the cost approach and the income approach may sometimes confuse analysts who apply the so-called cost savings method to measure the fair value of an intangible asset. However, the "cost savings method" is actually an income approach valuation method—and not a cost approach valuation method.

For example, let's assume that an owner/operator owns a particularly well known and well trusted trademark. The analyst concludes that, because of the current level of consumer awareness related to the subject trademark, the owner/operator will not have to spend $1,000,000 per year on institutional advertising for the next 10 years.

Therefore, the analyst may value the trademark by considering the present value of the $1,000,000 annual advertising "cost" avoided over the next 10 years.

In this cost savings method valuation analysis, the analyst may apply an after-tax discount rate to an after-tax projection of advertising expense savings. And, the analyst may also apply a TAB adjustment in order to conclude the value indication for the subject trademark.

However, it is noteworthy that this hypothetical example illustrates the application of the income approach and the cost saving method (sometimes called the cost avoidance method). This example does not illustrate the application of any cost approach valuation method to value the subject trademark.

Some analysts may confuse the cost approach RCNLD method with the income approach cost savings (or cost avoidance) method.

As discussed, the cost savings method is an income approach valuation method. This is because it is based on the present value of some avoided tax-deductible operating (period) expense (e.g., advertising expense, selling expense, shipping and delivery expense, research and development expense, etc.). It is not based on the measurement of intangible asset development costs.

Therefore, a TAB adjustment may be appropriate when applying the income approach cost savings method to value an intangible asset. That is because the cost savings method will often apply after-tax expense savings and an after-tax present value discount rate.

In contrast, the cost approach RCNLD method has no income tax component. Therefore, it is typically inappropriate to apply a TAB adjustment within the application of a cost approach valuation method.

As discussed above, the cost approach typically does not consider income taxes and, therefore, should not consider a TAB adjustment. However, there may be instances in which it is appropriate to consider applying a TAB adjustment to the cost approach value indication.

For instance, when performing a fair value measurement for financial accounting purposes, the analyst may be asked by the subject company's auditor to consider a TAB adjustment in the cost approach valuation of certain intangible assets.

Some additional errors and misconceptions with regard to the application of the cost approach are discussed further in the following section.

Errors and Misconceptions in the Application of the Cost Approach

There are many considerations that may be made, assumptions that may be selected and supported, and procedures that may be completed in order to apply the cost approach to the fair value measurement of an intangible asset. This section summarizes some of the analyst errors and misconceptions with regard to the application of the cost approach in the intangible asset fair value measurement.

First, without conducting an analysis, there is no reason to expect the value indication produced by applying the cost approach to be the same as the accounting book value of the subject intangible asset. The application of any cost approach valuation method will typically produce a value indication that is different from the historical-cost-based accounting book value recorded on the owner/operator's balance sheet as of the valuation date.

Second, the cost approach considers the current costs to develop a new intangible asset. The cost approach may include forward-looking components. This is because the cost approach considers such

current and forward-looking analysis components as developer's profit, entrepreneurial incentive, and functional and economic obsolescence.

Third, the cost savings (sometimes called cost avoidance) method is an income approach valuation method—and not a cost approach valuation method. Some analysts incorrectly assume that, because the cost savings method includes the word "cost" in the name, that it is a cost approach valuation method.

In contrast, the cost savings method is based on the present value of projected expense savings to the intangible asset owner/operator. That analysis of future operating expense (including any savings of a future operating expense) is different from the cost approach. The cost approach analyzes the expected future (capitalizable) expenditures required to develop a new intangible asset.

Fourth, the cost approach considers capitalizable expenditures (i.e., costs) and not current period expenses. This is another procedural difference between the cost approach and the income approach.

Fifth, the cost approach should consider an opportunity cost (i.e., lost income during the intangible asset replacement period) component within the analysis. The opportunity cost component is often referred to as entrepreneurial incentive.

Sixth, the cost approach should consider all forms of obsolescence. That is, the application of the cost approach should consider functional obsolescence (i.e., the inability of the intangible asset to perform the function it was designed to perform). In addition, the application of the cost approach should consider economic obsolescence (i.e., the inability of the owner/operator to earn a fair rate of return on the intangible asset cost approach value indication).

Seventh, it is generally inappropriate to apply a TAB adjustment to a cost approach value indication. This is because the cost approach analysis does not consider any adjustment for income tax expense within the valuation analysis. The application of a TAB adjustment inappropriately introduces a tax adjustment to the cost approach valuation analysis.

However, it may be appropriate for the analyst to apply a TAB adjustment in certain fair value measurement analyses in order to comply with the relevant financial accounting guidance.

In particular, considerations specific to the application of the cost approach in the context of a fair value measurement assignment are discussed in the following section.

Considerations Specific to Fair Value Measurement Assignments

Typical fair value measurement assignments involving intangible asset valuation include the following:

1. Intangible asset valuations prepared in the context of the acquisition accounting for a business combination (related to ASC Topic 805)
2. Intangible asset valuations performed in the context of testing for intangible asset impairment and goodwill impairment (related to ASC Topic 350).

Fair value measurements of private equity or venture capital fund portfolio investments may also involve valuations of intangible assets that were developed and owned by the portfolio company. Such an intangible asset valuation may be included in an asset accumulation method valuation analysis of the portfolio company.[5]

Each of the above-mentioned assignments typically involves the discrete valuation of an intangible assets as a component of the fair value measurement analysis.

Purchase accounting fair value measurement assignments are conducted after a business combination transaction. With limited exceptions, the ASC Topic 805 business combination provisions require the measurement of the assets acquired and the liabilities assumed to be recognized at acquisition date fair values.

The impairment testing of intangible asset carrying amounts may be conducted on a regular basis (typically annually) related to post-acquisition accounting. Under U.S. generally accepted accounting principles ("GAAP"), the guidance for impairment testing of indefinite-lived intangible assets and goodwill is provided in ASC Topic 350.

Both purchase accounting fair value measurements and indefinite-lived intangible asset or goodwill impairment testing assignments involve the fair value standard of value as prescribed by ASC Topic 820, *Fair Value Measurements*.

ASC Topic 820-10-20 defines fair value as "the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date."

Accordingly, the fair value standard of value may differ from other standards of value in that a fair value measurement should reflect all of the assumptions that market participants would use in

the pricing of an asset or liability, and not necessarily the specific reality or assumptions of the actual intangible asset owner/operator.

When preparing a fair value measurement for a financial accounting assignment, there are often additional procedures that the analyst should consider in order to take the perspective of a market participant.

The following list provides some of those fair-value-measurement-specific procedures that analysts should perform when developing an intangible asset fair value measurement for financial accounting purposes:

- Select the appropriate market for the intangible asset.
- Identify the market participants.
- Apply market participant assumptions.
- Determine the highest and best use for the intangible asset.

The owner/operator entity's intended use of an asset is typically not considered relevant for purposes of measuring fair value under ASC Topic 820. This is because the definition of fair value is market-based.

Typically, the analyst first begins with the actual circumstances or assumptions that may be applicable to the subject intangible asset owner/operator. Then, the analyst performs procedures to assess if evidence exists that market participants would make different assumptions.

In addition, certain components of a cost approach analysis may be analyzed and quantified differently in a fair value measurement assignment due to the market participant perspective. For example, an analyst performing a fair value measurement should consider whether a market participant would be willing to pay for the developer's profit or the entrepreneurial incentive components of the cost approach.[6]

The ASC topics contain specific guidance as to the scope and the application of the ASC Topic 820 standard. It is important for the analyst to comply with the ASC Topic 820 guidance when preparing valuations in compliance with GAAP. Accordingly, the analyst should refer to the relevant ASC topic when performing a fair value measurement for financial accounting purposes.

And while the ASC guidance establishes specific guidance for fair value measurement reporting, it does allow for professional judgment. For example, there may be diversity of practice with regard to certain procedures in developing a fair value measurement under ASC Topic 820.

One example of this diversity of practice is the treatment of the TAB adjustment. However, the relevant ASC guidance should be adhered to when preparing and documenting the processes and procedures performed in developing the fair value measurement even when professional judgment is applied.

Mandatory Performance Framework

Analysts should be aware of the recent developments related to fair value measurements and financial accounting assignments. These developments include:

1. the CEIV credential and
2. the publication of the MPF.

The CEIV credential is offered by several valuation professional organizations, including the American Institute of Certified Public Accountants ("AICPA"). This valuation credential was developed specifically with regard to valuations performed for fair value measurement and financial accounting purposes.

One of the important consequences of the development of the CEIV credential is the implementation of the MPF.

The MPF is defined in the *Mandatory Performance Framework for the Certified in Entity and Intangible Valuations Credential* as "a document for valuation professionals that provides guidance on how much support, in terms of scope of work and documentation, should be prepared or obtained when designing, implementing, and conducting valuations of businesses, business interests, intangible assets, certain liabilities, and inventory used for management assertions made in financial statements issued for financial reporting purposes."

Only CEIV credential holders are currently required to comply with the provisions of the MPF (note that the "M" in MPF stands for "mandatory").

However, for valuation professionals who do not obtain the CEIV credential, the Performance Framework task force (the task force that developed the MPF) believes that the MPF (1) represents best practices and (2) provides instructional guidance and parameters that will improve the level of documentation and work related to fair value measurement and other financial accounting valuation assignments.

This MPF professional guidance particularly relates to due diligence procedures and to analysis documentation and support.

The MPF consists of the following four sections:

- Preamble—which provides an overview of the framework's scope and purpose.
- Valuation Engagement Guidance—which establishes the parameters of the documentation requirements to which valuation professionals should adhere.
- Mandatory Performance Framework Glossary—which sets forth the definitions of terms that may be unique to the framework and, when necessary, defines their meaning within the context of the framework.
- Authoritative and Technical Guidance—which includes a list of accounting standards, auditing standards, valuation standards, and certain technical literature applicable to the guidance presented in the framework.

In addition, a separate document, *Application of the Mandatory Performance Framework for the Certified in Entity and Intangible Valuations Credential* ("the Application"), provides specific guidance on the application of the MPF to specific subject matter interests.

The MPF and the Application emphasize procedures to intangible asset valuation that relate to the market approach and the income approach consistently with the fair value standard for financial reporting.

The MPF and the Application also provide relevant guidance concerning the application of the cost approach to intangible asset valuation for fair value measurement purposes. Among other topics, the MPF includes professional guidance related to the estimate of the TAB adjustment, the discount rate derivation, the application of valuation discounts and premiums, the estimate of the intangible asset UEL, the valuation of the assembled workforce, and the reconciliation of intangible assets values when multiple valuation approaches are used.

In addition to providing guidance on the factors to consider while performing an intangible asset valuation, the MPF explains minimum scope of work and due diligence procedures that the analyst should perform when selecting and applying the cost-based approach, as well as other generally accepted valuation approaches and methods.

While it is only a requirement for CEIV credential holders to comply with the MPF, it is still considered best practice for noncredentialed analysts to follow the guidance presented in the MPF when performing fair value measurement assignments for financial accounting purposes.

Simplified Illustrative Examples of the Cost Approach

Illustrative Example 1

The simplified illustrative example below involves the application of the cost approach in the valuation of internally developed computer software. This illustrative example is based on the following assumptions:

- Theta, LLC ("Theta"), is the owner/operator of the software.
- Theta is a management consulting company.
- The valuation date is January 1, 2021.
- Computer software is important to the Theta business operations.
- The standard of value is fair value.

The Theta IT staff has developed numerous computer software programs over the years. All of these programs may be grouped into the seven major software systems listed in Exhibit 6.

The analyst worked with the Theta IT management to estimate the amount of effort required to replace the functional equivalent (i.e., the economic utility) of the software as of the valuation date. The estimates of the number of development effort person-months required to replace the utility of each of the subject systems are listed in Exhibit 6.

The analyst concluded it would require about 11,856 person-months to replace the functionality of the subject software.

The analyst studied the actual software development costs at Theta during the year 2020. Based on this study, the analyst concluded that the average cost per person-month for the Theta software development effort was $14,585.

That total cost includes all direct costs and all indirect costs related to the company's actual IT software development efforts. Therefore, that cost per IT person-month is a full absorption software development cost estimate.

The analyst estimated the developer's profit component related to the software RCN. The analyst surveyed several customized software development companies, of the type that would accept contracts to actually replace the subject systems.

Exhibit 6
Theta, LLC
Internally Developed Computer Software
Cost Approach
Replacement Cost New less Depreciation Method
Valuation Summary
As of January 1, 2021

System No.	Computer Software System	Estimated Software Development Development Effort—in Person-Months	Elapsed Time to Develop Replacement Software—in Calendar Months	Full Absorption Cost per Person-Month (includes direct and indirect cost components)	Indicated RCNLD Method Component $000
1	AS/400	4,531	29	$14,585	66,100
2	Point of Sale	575	25	14,585	8,400
3	Tandem	3,304	16	14,585	48,200
4	Unisys	1,229	5	14,585	17,900
5	Pioneer	1,807	41	14,585	26,400
6	Voyager	325	12	14,585	4,700
7	Host to Host	85	9	14,585	1,200
	Total Direct Cost and Indirect Cost Components (rounded)	11,856	24		172,900
	Plus: Developer's profit (rounded)				27,700
	Equals: Subtotal				200,600
	Plus: Entrepreneurial Incentive (rounded)				31,200
	Equals: Total Replacement Cost New				231,800
	Less: Functional Obsolescence (see Exhibit 7)				36,900
	Equals: Subtotal				194,900
	Less: Economic Obsolescence, at 19% (see Exhibit 8)				37,000
	Equals: Computer Software RCNLD				157,900
	Fair Value of Theta Internally Developed Computer Software (rounded)				$158,000

These software development companies indicated that they would charge a 16 percent operating profit margin (over their total actual development costs) to replace the subject software. The analyst added this developer's profit cost component to the RCN estimate.

As indicated in the "Elapsed Time to Develop" column in Exhibit 6, it would take, on average, 24 elapsed months to develop and install all of the hypothetical replacement software. These software systems are important to the Theta ongoing business operations. Without these (or equivalent) software systems, Theta cannot operate as a management consulting firm.

Therefore, the analyst decided to estimate the entrepreneurial cost component as the opportunity cost related to total operating profits for a 24-month software replacement period.

The analyst estimated the normalized operating profits (measured here as earnings before interest and taxes or "EBIT") for a 24-month software replacement period.

Working with Theta financial management, the analyst concluded that this 24-month opportunity cost (i.e., total company lost profits without the computer software in place) is $31,200,000. The analyst included this opportunity cost amount as the entrepreneurial incentive cost component.

Including all four cost components, the analyst estimated the subject software RCN to be $231,800,000.

During the due diligence examination, the analyst learned that both the Unisys system and the Pioneer system are currently in the process of being replaced. The Theta IT department is in the process of developing replacement applications software for both systems. In fact, the Unisys system is expected to be replaced in one year, and the Pioneer system is expected to be replaced within three years.

Based on these time period estimates, and working with Theta IT management, the analyst estimated that (1) the Unisys system is 80 percent functionally obsolete and (2) the Pioneer system is 50 percent functionally obsolete.

The analyst estimated functional obsolescence related to the subject software as summarized in Exhibit 7.

During the due diligence, the analyst learned that most of the software was developed and installed between five and eight years ago. During that earlier time period, Theta was much more profitable than it is now.

Due to intense competition in its industry, the company's profit margins, growth rates, and returns on investment have all decreased between (1) the period when the subject software was developed (i.e., 2013 through 2016) and (2) the current period (i.e., latest 12 months ["LTM"] of 2020).

The analyst considered these factors in the assessment of economic obsolescence. The analyst prepared Exhibit 8 to summarize some of the economic obsolescence elements considered in the software valuation.

Based on the analysis of the financial and operational metric presented in Exhibit 8, the analyst selected 19 percent as the appropriate economic obsolescence measurement. The analyst applied this economic obsolescence percentage to the RCNLD (replacement cost new less depreciation) indication presented in Exhibit 6.

Based on the illustrative facts presented above, the analyst completed the computer software valuation.

Based on the application of the cost approach, the analyst concluded that the fair value of the Theta internally developed computer software was $158,000,000 as of January 1, 2021.

Illustrative Example 2

As a second example illustrating an application of the cost approach, let's assume that the analyst is asked to value an internal medicine practice. Let's call this internal medicine practice the Beta Group ("Beta"). The valuation date is December 31, 2020.

A local not-for-profit hospital, Gamma Hospital ("Gamma"), intends to approach the Beta practice owners with an unsolicited offer to buy the practice assets. Accordingly, the Gamma board of directors has retained the analyst to estimate a purchase offer price for the Beta practice assets.

Let's say the Beta practice employs 10 physicians, 20 clinical staff members (registered nurses, medical technicians, etc.), and 10 administrative staff (billing clerks, receptionists, etc.). As part of the practice valuation, the analyst estimates the value of the Beta assembled workforce.

The analyst decides to apply the cost approach and the RCNLD method.

An assembled workforce is often considered a contributory asset. The MPF defines contributory assets as "any tangible or intangible assets used in

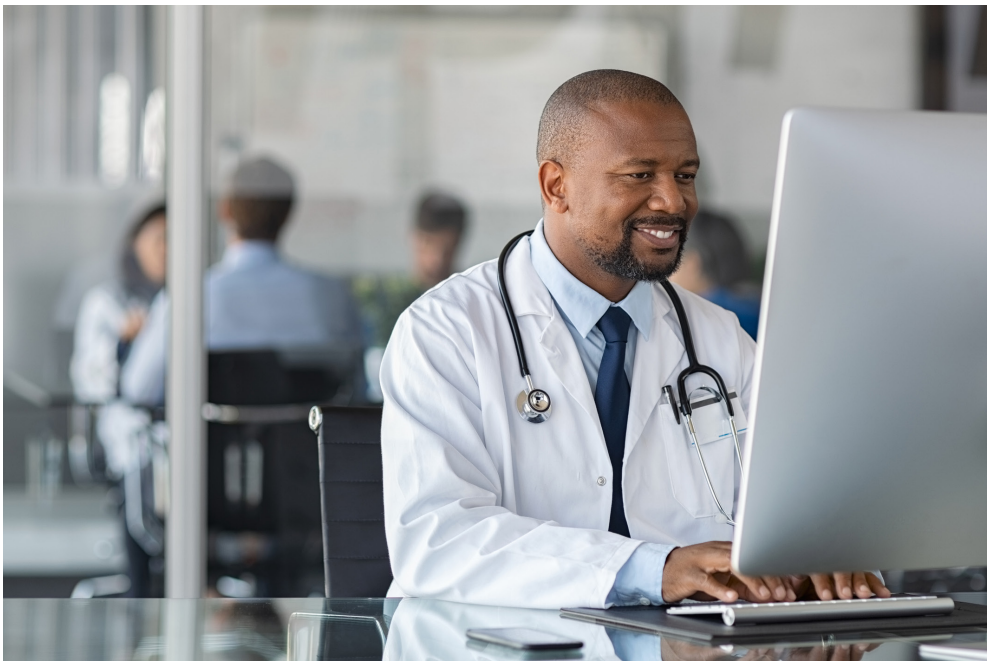


Exhibit 7
Theta, LLC
Internally Developed Computer Software
Cost Approach
Functional Obsolescence Analysis
As of January 1, 2021

Computer Software System	RCN Total Direct and Indirect Cost Components $000	RCN Developer's Profit and Entrepreneurial Incentive Cost Components	Total RCN Cost Components $000	Percent Functional Obsolescence	Total Functional Obsolescence $000
Unisys	17,900	34%	24,000	80%	19,200
Pioneer	26,400	34%	35,400	50%	17,700
Total					36,900

Exhibit 8
Theta, LLC
Internally Developed Computer Software
Cost Approach
Economic Obsolescence Analysis
As of January 1, 2021

Theta Financial and Operational Metrics	Average of 2013–2016	LTM 2020	Percent Difference
EBIT Profit Margin	24%	20%	-16.7%
Net Cash Flow Margin	12%	10%	-16.7%
Pretax Net Income Margin	15%	12%	-20.0%
EBIT Return on Total Assets	16%	14%	-12.5%
EBIT Return on Net Assets	20%	16%	-20.0%
5-Year Compound Revenue Growth Rate	6.5%	4.5%	-30.8%
5-Year Compound Net Cash Flow Growth Rate	7.5%	5.5%	-26.7%
Average Sales Price per Unit Sold	$1,200	$1,050	-12.5%
Mean Percent Deficiency in Metrics			-19.5%
Median Percent Deficiency in Metrics			-18.4%
Trimmed Mean Percent Deficiency in Metrics			-18.8%
Selected Economic Obsolescence			-19%

the generation of the cash flows associated with the subject intangible asset that it being valued."[7]

Income approach valuation methods applied to intangible assets typically include consideration of contributory asset charges (i.e., charges against revenue in a cash flow projection that reflect a return on or of contributory assets used in the generation of the cash flow from the intangible asset being valued).

However, since the cost approach does not involve a projection of income or cash flow, it is typically unnecessary to consider contributory asset charges if the subject intangible assets (or asset) are all being valued by applying a cost approach.

Still, contributory assets such as an assembled workforce are often valued for other purposes, often for inclusion in a broader valuation engagement. For example, a contributory asset such as an assembled workforce may be valued in order to estimate a contributory asset charge to apply to another intangible asset that is valued by applying an income approach valuation method.

Exhibit 9 presents a simplified illustration of the analyst's RCNLD method valuation of the Beta assembled workforce.

As indicated in Exhibit 9, the analyst estimated the RCN for the 50-person workforce to be $3,652,000. Of course, this RCN does not indicate the value of the assembled workforce. The RCN indicates the cost for the owner/operator to replace all of the current 50 employees with new employees of comparable experience and expertise.

The RCN estimate considers the total amount of compensation paid to each practice employee, labeled as "average salary" in Exhibit 9. In the RCN analysis, these costs are typically called direct costs.

The RCN estimate also considers all of the other expenses that the owner/operator incurs related to each employee. Those costs are typically called indirect costs.

So, the total annual cost that the owner/operator pays for an employee is called the full absorption cost in Exhibit 9. This full absorption cost includes (1) the compensation paid by the employer to the employee and (2) the expenses paid by the employer to others so that the employee can perform his or her job.

The RCN estimate includes all of the costs that the employer would incur to replace the current workforce with a brand new (but comparable) workforce.

In Exhibit 9, the analyst expressed the replacement cost components as a percent of the employee full absorption cost. Alternatively, the analyst could calculate the replacement cost components as dollars per employee, dollars per year of employee tenure, or some other dollar or percentage metric.

The figure of $3,652,000 represents the direct cost and indirect cost components related to the assembled workforce. There are two additional cost components for the analyst to consider:

1. Developer's profit
2. Entrepreneurial incentive

For the purpose of this example, the developer's profit considers the profit margin that a management consulting, human resources outsourcing, or professional staffing firm would earn if a willing buyer retained such a firm to create the assembled workforce. Such a professional staffing or consulting firm would incur $3,652,000 in out-of-pocket costs. That firm would expect the subject workforce willing buyer (i.e., Gamma) to reimburse them for such out-of-pocket costs.

In addition, the staffing firm would expect to earn a profit margin. Otherwise, the staffing firm would never accept the assignment to create a replacement workforce.

Likewise, the practice owners would expect to earn a profit on the sale of their internally developed assets to the willing buyer. Otherwise, the owners would not be motivated to enter into the practice sale transaction.

In this example, let's assume that the analyst surveyed professional firms that are in the business of assembling a fully trained workforce for corporate or institutional employers. Let's assume the analyst's survey indicated that such firms would expect to earn a 10 percent operating profit margin on this type of staffing development assignment.

In Exhibit 9, the developer's profit cost component is calculated as (1) the $3,652,000 total direct and indirect costs multiplied by (2) a 10 percent developer's profit margin.

The analyst also considers entrepreneurial incentive in the RCN analysis. This cost component would be required to motivate the owner/operator to develop the subject intangible asset—instead of pursuing some other investment opportunity.

There are several alternative procedures for estimating entrepreneurial incentive. One procedure is to estimate the lost profits opportunity cost that the owner/operator would experience during the intangible asset replacement period.

When using this procedure, the analyst should be careful to appropriately allocate the owner/operator's overall profit to all of the business intangible assets.

Exhibit 9
The Beta Group
Trained and Assembled Workforce
Cost Approach
Replacement Cost New less Depreciation Method
Replacement Cost New Estimate
As of December 31, 2020

Assembled Workforce Employee Component	No. of Employees	Average Salary	Other Costs Factor	Full Absorption Cost	Percent of the Total Annual (Full Absorption) Cost Required to Recruit Replacement Employees	Hire Replacement Employees	Train Replacement Employees	Percent of Full Absorption Cost to Replace Employees	Average Replacement Cost New Component	Total Replacement Cost New Component
Physicians	10	180,000	1.6	288,000	20%	20%	40%	80%	230,400	$2,304,000
Clinical Staff	20	60,000	1.5	90,000	10%	10%	30%	50%	45,000	900,000
Administrative Staff	20	40,000	1.4	56,000	5%	10%	25%	40%	22,400	448,000
Total Employees	50									
Total Direct Cost and Indirect Cost Components										3,652,000
Add:										
Developer's Profit Cost Component:										
Developer's Profit Margin										10%
Developer's Profit Cost Component (rounded)										365,000
Total Direct Cost and Indirect Cost plus Developer's Profit										4,017,000
Add:										
Entrepreneurial Incentive:										
Estimated Total Workforce Replacement Period					6 Months					
Estimated Average Workforce Replacement Cost Investment (i.e., $4,017,000 total cost ÷ 2)					$2,009,000					
Required Annual Return on Investment					16%					
Required Return on Investment for 6-Month Replacement Period					8%					
Entrepreneurial Incentive (i.e., $2,009,000 × 8%) (rounded)					$161,000					161,000
Total Replacement Cost New										$4,178,000

Another entrepreneurial profit measurement procedure is to calculate a fair rate of return on the total intangible asset cost components (i.e., direct costs, indirect costs, and developer's profit).

The premise of this entrepreneurial profit measurement procedure is that the owner/operator would not develop the replacement intangible asset if it did not expect to earn a fair rate of return on its total development investment—during the total development period.

Let's assume that the analyst applied this second entrepreneurial incentive measurement procedure in the assembled workforce valuation. Let's assume that the total elapsed workforce recreation period will be six months.

From Exhibit 9, the average investment during the six-month period will be $2,009,000. Let's assume the analyst calculates a fair return on investment for Beta to be 16 percent. This return on investment is often measured as the owner/operator's weighted average cost of capital ("WACC").

In the Exhibit 9 example, the $2,009,000 total investment is multiplied by the required annual rate of return of 16 percent, adjusted for the six-month development period.

In Exhibit 9, the total entrepreneurial incentive is estimated to be $161,000. This is the fourth RCN cost component. The total assembled workforce RCN is the sum of all four cost components, or $4,178,000.

Finally, in Exhibit 9, the analyst estimates the cost to replace the current 50 employees with 50 new employees of comparable experience and expertise. Since the RCN estimate includes a job training component, these 50 new employees (1) would know how to do their jobs and (2) could work together efficiently on the hypothetical replacement date.

Exhibit 9 summarizes the assembled workforce RCN. In order to reach a value conclusion, the analyst next has to estimate the RCNLD of the workforce. As in any cost approach analysis, the analyst has to consider if there is any deterioration or obsolescence related to this intangible asset.

From the practice acquisition due diligence, the analyst learns the following facts about the Beta assembled workforce:

- Two of the practice's lab techs (part of the clinical staff) are scheduled to retire in the next year or so.
- One of the practice's billing accountants (part of the administrative staff) is out on disability leave and is not expected to return to work.
- The practice is overstaffed with regard to administrative personnel; in addition to the above-mentioned billing accountant, any typical willing buyer would eliminate two of the administrative positions.
- The practice has experienced very low turnover of the clinical staff. Because of long tenure of these nurses and technicians, they earn an average annual salary of $60,000 (see Exhibit 9). If the actual clinical employees were replaced, they would be replaced with adequately qualified (but less tenured) employees earning an average annual salary of $50,000.

Now, the analyst has all of the information necessary to calculate the appropriate physical deterioration and functional obsolescence allowances for the Beta assembled workforce.

In Exhibit 12, the analyst estimates the amount of physical deterioration. Exhibit 10 considers that two clinical staff will retire soon. The value of an assembled workforce is the owner/operator's expectation that employees will show up for work, be fully trained, and be able to do their jobs effectively and efficiently.

If a willing buyer will soon have to incur the cost to recruit, hire, and train replacement employees, then that buyer will not pay the seller for the value of the retiring (and soon to be replaced) employees. Exhibit 10 also considers that one administrative employee is, in fact, not showing up for work. That administrative employee is on disability leave.

Both of these two replacement cost adjustments relate to (1) age (impending retirement) and (2) inability to perform the job (disability). Therefore, these two cost adjustments are appropriately classified as physical deterioration.

In Exhibit 10, the developer's profit and entrepreneurial incentive cost components are based on these same cost component relationships to total direct cost and indirect cost as are represented in Exhibit 9.

Exhibit 11 presents the analyst's estimate of the workforce functional obsolescence. This functional obsolescence estimate considers that the Beta workforce has a superadequacy of two administrative employees.

This functional obsolescence estimate also considers that the Beta workforce has a superadequacy of excess experience in the clinical staff. This superadequacy is causing the average replacement salary for the clinical staff to be $10,000 greater than the desired clinical staff replacement salary.

Exhibit 10
The Beta Group
Trained and Assembled Workforce
Physical Deterioration
As of December 31, 2020

Workforce Component	No. of Employees	Average Direct and Indirect Replacement Cost New	Total Direct and Indirect Replacement Cost New	Developer's Profit and Entrepreneurial Incentive Cost Components	Total Replacement Cost New	Percent Depreciation	Accumulated Depreciation
Clinical staff	2	$45,000	$90,000	$13,000	$103,000	100%	$103,000
Administrative staff	1	22,400	22,400	3,200	25,600	100%	25,600
Total				16,200	128,600		$128,600

Exhibit 11
The Beta Group
Trained and Assembled Workforce
Functional Obsolescence
As of December 31, 2020

Workforce Component	No. of Employees	Excess Direct and Indirect Replacement Cost New	Excess Developer's Profit and Entrepreneurial Incentive Components	Excess Total Replacement per Employee	Functional Obsolescence
Clinical Staff	18	$7,500	$1,100	$8,600	$154,800
Administrative Staff	2	22,400	3,200	25,600	51,200
Total					$206,000

Exhibit 12
The Beta Group
Trained and Assembled Workforce
Cost Approach
Replacement Cost New less Depreciation Estimate
As of December 31, 2020

Cost Approach Analysis	Cost Component
Replacement Cost New (all employees)	$4,178,000
Less: Physical Deterioration Allowance (inadequate staff)	128,600
Less: Functional Obsolescence Allowance (superadequate staff)	206,000
Equals: Replacement Cost New less Depreciation	$3,843,400

This excess replacement salary causes the average annual full absorption cost to be $15,000 greater than the desired clinical staff replacement cost. As a result, the excess full absorption cost causes the average RCN (direct cost and indirect cost component) per clinical employee to be $7,500 greater than the desired replacement cost per employee.

Both of these excess capital costs (i.e., related to excess number of intangible assets and excess quality of intangible assets) relate to superadequacies. Therefore, these two cost adjustments are appropriately classified as functional obsolescence.

In Exhibit 11, the developer's profit and the entrepreneurial incentive cost components bear the same relationship to total direct costs and indirect costs as indicated in Exhibit 10.

Exhibit 12 presents the RCNLD method analysis for the Beta assembled workforce. This RCNLD analysis concludes the value of (1) the appropriately sized practice workforce and (2) the appropriately experienced practice workforce.

The depreciation and obsolescence adjustments are appropriate because a willing buyer would not pay the willing seller for:

- the value of the employees who are not needed or who are not working and
- the value of employees who are overcompensated or overqualified to perform the required tasks.

This RCNLD conclusion indicates what a willing buyer would pay to a willing seller for this assembled workforce, assuming that there is no economic obsolescence related to this intangible asset.

Summary and Conclusion

Analysts may be asked to value an intangible asset for various reasons. In addition to fair value measurements for financial accounting purposes, analysts may be asked to estimate intangible asset value for various transaction, taxation, financing, litigation, bankruptcy, and owner/operator planning purposes.

In all cases, the analyst should consider all generally accepted intangible asset valuation approaches, methods, and procedures. Many analysts are more familiar with market approach and income approach valuation methods.

However, there are numerous instances when cost approach valuation methods are particularly applicable to the intangible asset valuation analysis.

This discussion summarized the procedures and considerations with regard to the application of the cost approach to intangible asset fair value measurement. The cost approach is applicable to the fair value measurement of intangible assets in many industries, particularly the technology, financial services, professional services, and health care industries.

However, the cost approach is only applicable if the analyst:

1. appropriately considers all of the cost components and
2. appropriately identifies and quantifies all obsolescence allowances.

Notes:

1. Corporate and Intangibles Valuation Organization, LLC, Version 1.0, January 2017.
2. See the AICPA Statements on Standards for Valuation Services (or, "SSVS"), Section 100, paragraph 31.
3. Corporate and Intangibles Valuation Organization, LLC, *Application of the Mandatory Performance Framework for the Certified in Entity and Intangible Valuations Credential*, Section A3.4, Version 1.0 (January 2017).
4. As discussed further below, the cost savings method is actually an income approach valuation method, not a cost approach valuation method. Accordingly, while it is typically appropriate to consider and apply a TAB adjustment when applying an income approach valuation method, it is typically not appropriate to apply a TAB adjustment when applying a cost approach valuation method.
5. See, for example, *Accounting and Valuation Guide: Valuation of Portfolio Company Investments of Venture Capital and Private Equity Funds and Other Investment Companies* (AICPA, June 1, 2019), Sections 5.95–5.97.
6. *Accounting and Valuation Guide: Valuation of Portfolio Company Investments of Venture Capital and Private Equity Funds and Other Investment Companies*, Section 5.108.
7. Corporate and Intangibles Valuation Organization, LLC, *Application of the Mandatory performance Framework for the Certified in Entity and Intangible Valuations Credential*, Section A3.7, Version 1.0 (January 2017).

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