Intangible Asset Valuation Approaches and Methods

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There are numerous reasons to apply the cost approach to the valuation of an intangible asset. Before applying this valuation approach, the valuation analyst should be familiar with the generally accepted cost approach methods and procedures. In addition, the valuation analyst should have sufficient data to measure (1) the intangible asset cost components and (2) the intangible asset obsolescence components. This discussion summarizes both (1) the data requirements and (2) the analytical procedures needed to apply the cost approach.

Introduction

As mentioned in the previous discussion, there are three generally accepted intangible asset valuation approaches: the cost approach, the market approach, and the income approach. The valuation analyst will typically consider, and attempt to apply, all three intangible asset valuation approaches. This is because the application of multiple valuation approaches provides the analyst with multiple value indications.

These multiple value indications often reconcile into a reasonable range of intangible asset values (e.g., with the analyst being able to consider mean, median, mode, interquartile measures, and other central tendency measures). Ideally, the multiple value indications provide mutually supportive evidence for the analyst's final intangible asset value conclusion.

Typically, due to data limitations, most intangible asset valuations are primarily based on only one valuation approach. For each intangible asset valuation, the analyst will typically select the approach (or approaches):

1. for which there are the greatest quantity and quality of available data;
2. that best reflect the actual transactional negotiations of market participants in the owner/operator industry;
3. that best fit the characteristics (e.g., use, age, etc.) of the subject intangible asset; and
4. that are most consistent with the practical experience and the professional judgment of the individual analyst.

Within each valuation approach, there are several valuation methods that the analyst can select and apply. And, within each valuation method, there are also numerous procedures that the analyst can perform.

Therefore, to use the proper professional jargon, valuation procedures are performed within a valuation method to conclude a value indication. And, valuation methods are applied within a valuation approach to conclude a value indication.

The analyst may perform two or more valuation methods within a single approach. For example, the analyst may perform three different income approach valuation methods and then reconcile the three value indications to conclude a single income approach value indication.

At this point in the process, the valuation analyst typically reconciles the various valuation approach indications (if more than one approach is used). This synthesis of the various value indications will result in the analyst's final intangible asset value conclusion.

"... all cost approach methods apply a comprehensive definition of cost, including consideration of an opportunity cost during the intangible asset development stage."

The Economics of Intangible Asset Valuation

All cost approach valuation methods are based on the economics principle of substitution. That is, the value of the subject intangible asset is influenced by the cost to create a new substitute intangible asset.

As will be discussed, all cost approach methods apply a comprehensive definition of cost, including consideration of an opportunity cost during the intangible asset development stage. In addition, the cost of the new substitute intangible asset should be reduced (or depreciated) in order to make the hypothetical new intangible asset comparable to the "old" subject intangible asset.

Not all commercial intangible assets are fungible. Some intangible assets are unique and, therefore, cannot be replaced. For example, there may only be one hospital certificate of need (CON) granted by the state for a particular town. In that case, either a hospital holds the one unique CON or it does not. A substitute or replacement CON will not be available at any cost. In such an instance, the cost approach may not be the best approach to use to value the CON intangible asset.

The intangible asset may be unique because it is legally protected. This situation may occur in the case of an intellectual property, such as a patent, copy, trademark, or trade secret. That is, the marketplace cannot actually replace an intellectual property with a replacement intellectual property. This is because the subject is a legally protected intellectual property, and the replacement intellectual property would infringe on the unique subject intellectual property.

In this situation, the analyst should note that the cost approach considers the cost to replace the utility of the subject intellectual property. The application of the cost approach assumes that the subject 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 provides the same utility as the actual intellectual property. However, since the valuation 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 FCC license valuation.

A patent is typically not a fungible intangible asset. A patent (by definition) is a unique intellectual property. 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 (PTO).

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 a substitute patent. A perfectly identical substitute patent would, by definition, infringe on the subject 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 used in an intellectual property valuation, although it may have certain application limitations.

All market approach valuation methods are based on these two economics principles:

1. Efficient markets
2. Supply and demand

That is, the value of the intangible asset may be estimated by reference to prices paid in the marketplace for the arm's-length sale or license of a comparable (or a guideline) intangible asset.

A comparable intangible asset is very similar to the subject intangible asset. The comparable intangible asset is approximately the same age, is at approximately the same place in its life cycle, and serves a similar function as the subject intangible asset.

The comparable intangible asset may be used in the same industry, performing about the same function, at about the same size as the subject intangible asset. Sales or licenses of a comparable intangible asset provide direct pricing evidence to the analyst about the subject intangible asset. The valuation analyst may be able to apply mean or median pricing metrics to the subject intangible asset.

A guideline intangible asset is generally similar (but not identical to) the subject intangible asset. The guideline intangible asset should be subject to the same general risk and expected return investment elements as the subject intangible asset.

Compared to the owner/operator intangible asset, the guideline asset may be operated in a different industry, at a different size company, with a different function, and so forth. Sales or licenses of a guideline intangible asset still provide meaningful (albeit indirect) pricing evidence to the analyst about the subject intangible asset.

In order to obtain pricing evidence from guideline intangible asset sale or license transactions, the valuation analyst should compare the guideline asset properties to the subject asset. This comparison is often based on such measures as relative growth rates, relative profit margins, relative returns on investment, etc. These comparative analyses will allow the valuation analyst to select subject-specific valuation pricing metrics.

The valuation analyst will consider comparable uncontrolled transaction (CUT) pricing data related to comparable intangible asset and to guideline intangible asset sales or licenses. The valuation analyst will consider the CUT data in order to extract pricing multiples or capitalization rates that can be applied to the intangible asset.

All income approach valuation methods are based on the economics principle of anticipation. That is, the value of any investment is the present value of the income that the owner expects to receive from owning that investment. All income approach methods involve a projection of some measure of owner/operator income over the intangible asset's RUL.

This income measure may relate to the following:

1. The income earned from operating the intangible asset in the owner/operator business enterprise (i.e., operating income)
2. The income earned from outbound licensing of the intangible asset from the owner/licensor to an operator licensee that will pay a royalty (or some other payment) for the use of the asset (i.e., ownership income)

This intangible-asset-related income projection is converted to a present value by the use of a risk-adjusted discount rate (or an annuity period direct capitalization rate).

In summary, cost approach methods are particularly applicable to the valuation of a recently developed intangible asset. In the case of a relatively new intangible asset, the owner/operator development cost and development effort data may still be available (or may be subject to an accurate estimation).

In addition, cost approach methods are also applicable (1) to the valuation of an in-process intangible asset and (2) to the valuation of a noncommercialized (or defensive use) 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 intangible asset).

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

Market approach methods are particularly applicable when there is a sufficient quantity of comparable (almost identical) intangible asset transaction data or guideline (similar from a risk and expected return perspective) intangible asset transaction data. These intangible asset transactions may relate to either sale or license transactions.

Such arm's-length, third-party transactions are typically called CUT sales or licenses. The valuation analyst will attempt to extract market-derived valuation pricing metrics (e.g., pricing multiples or capitalization rates) from these CUT data to apply to the corresponding metrics of the subject intangible asset.

Income approach methods are particularly applicable to situations in which the subject intangible asset is used to generate a measurable amount of income. That income can be either (1) operating income (when the intangible asset is used in the owner's business operations to increase revenue or to decrease costs) or (2) ownership income (when the intangible asset is licensed from the owner/licensor to an operator/licensee in order to generate royalty income).

Income approach methods may also be used when the owner/operator has elected not to commercialize the intangible asset. The owner/operator may have elected to develop and maintain the intangible asset for defensive purposes. This situation would be the case when this deliberate forbearance of use is for the purpose of protecting the income that is produced by the owner/operator's other intangible assets.

The applicable measure of income in this analysis would be the "opportunity cost" related to the defensive use intangible asset. That opportunity cost is often measured as (1) the actual income generated by the "protected" intangible asset less

(2) the income that the protected intangible asset would generate "but for" the defensive protection of the subject (i.e., the defensive use) intangible asset.

The Intangible Asset Valuation Process Data Gathering and Due Diligence

Before the valuation analyst selects and applies each valuation approach, method, and procedure, the analyst will typically perform a due diligence investigation. Sometimes, the client's legal counsel may participate in this due diligence process. This is particularly the case if the intangible asset valuation relates to a transaction, financing, or litigation matter.

These valuation analyst due diligence procedures relate to identifying and obtaining information for the valuation analysis. The analyst's due diligence process is a supplement to—and not a substitute for—the lawyer's legal due diligence process.

First, the valuation analyst will typically gather and analyze information related to the intangible asset current owner/operator. The information will typically relate to both the historical development and the current use of the intangible asset.

Such information will typically include 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
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, including the following economic benefit 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, COGS, SG&A, R&D)
   - 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 SWOT analysis)

The valuation 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., hypothetical willing buyer) owner/operator:

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

To the extent that the intangible asset is subject to an inbound or outbound license (or other contract), the valuation analyst may consider common intangible contract terms. Many common terms associated with an intangible asset use license or development/commercialization agreement are listed in Exhibit 1.

The valuation analyst may also review and challenge (1) any owner/operator-prepared financial projections and (2) any owner/operator-prepared measures of intangible asset economic benefits. In particular, the analyst may test the achievability of such projections and the reasonableness of such economic benefit measures against industry, guideline company, and other benchmark comparisons. For example, the analyst may perform the following benchmark comparative analyses:

1. Compare any owner/operator prior-prepared projections to the owner/operator actual historical results of operations
2. Compare any owner/operator current management projections to the owner/operator current capacity constraints

Exhibit 1
Typical Terms Included in an Intangible Asset License Agreement or Other Contract

1. Licensor/licensee responsibility common contract terms:
   - identity of the licensor and the licensee
   - Term of the agreement (including any renewal options)
   - The 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 common intangible asset contract terms:
   - Minimum use, production, or sales requirements
   - Minimum marketing, promotion, or commercialization expense requirements
   - Research and development technology development payments, development completion payments
   - Party responsible to obtain the required regulatory approvals
   - Milestone license payments
   - Rights to any future developments
   - Rights to sub-license

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 (CPM) data for the industry in which the owner/operator competes
5. Consider selected guideline publicly traded company comparable profit margin (CPM) 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 an intangible asset RUL 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 will typically compare the owner/operator historical and projected results of operations to the selected guideline public companies (described below). In addition, the analyst may also compare the owner/operator results of operations to published industry data sources. Exhibit 2 presents some of the common published industry data sources that valuation analysts often use for these intangible asset benchmark comparative analyses.

The Exhibit 2 data sources allow the valuation analyst to compare to owner/operator financial results to benchmark industry expense ratios, profit margins, returns on investment, and so on. Such a comparison assists the valuation 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.

Reasons to Apply the Cost Approach

For the most part, the valuation analyst's selection of intangible asset valuation approaches is a process of elimination. The valuation analyst will typically attempt to apply all approaches for which there are reliable data available. If there are sufficient reliable data to perform all three valuation

Exhibit 2
Industry Financial Ratio Data Sources
That May Be Used in the Intangible Asset Due Diligence

- The Risk Management Association—Annual Statement Studies: Financial Ratio Benchmarks
- BizMiner (The Brandow Company)—Industry Financial Profiles
- CCH, Inc.—Almanac of Business and Industrial Ratios
- Fintel, LLC—Fintel Industry Metrics Reports
- MicroBilt Corporation (formerly IntegraInfo)—Integra Financial Benchmarking Data
- ValueSource—IRS Corporate Ratios
- Schonfeld & Associates, Inc.—IRS Corporate Financial Ratios

approaches, then the analyst will typically apply all three approaches.

If there are only sufficient reliable data to perform two approaches, then the analyst will typically apply those two approaches. And, if there are only sufficient reliable data available to perform the cost approach, then the analyst will apply 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 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 for which the owner/operator historical development cost data are still available
3. Intangible assets that are operated by an owner with the expertise to assist the valuation analyst in the estimation of a current development cost
4. Intangible assets that are operated by an owner with the expertise to assist the valuation analyst in the estimation (a) of RUL and (b) of obsolescence
5. Intangible assets that are used (or used up) in the production of income but which themselves do not produce any income (e.g., product formulae, employee or work station training/operator manuals, operating procedures, computer software, an assembled workforce); these intangible assets are sometimes referred to as "back room" intangible assets

In selecting the cost approach, the valuation analyst should be confident that there are sufficient reliable data available to estimate both the intangible asset current cost (e.g., replacement cost new or reproduction cost new) and all forms of intangible asset obsolescence (including economic obsolescence).

The estimation of obsolescence often involves an analysis of the intangible asset's RUL. Intangible asset RUL analysis is presented in a following discussion.

Cost Approach Valuation Methods

There are several cost approach valuation methods. Each valuation method uses a particular definition (or measurement metric) of cost. The two most common cost definitions are as follows:

1. Reproduction cost new
2. Replacement cost new

Reproduction cost new measures the total cost, in current prices, to develop an exact duplicate of the intangible asset. Replacement cost new measures the total cost, in current prices, to develop a new intangible asset having the same functionality or utility as the subject 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.

There are other cost definitions that may also be applicable to a cost approach valuation. Some valuation 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 subject intangible asset.

Some valuation analysts consider trended historical costs as a cost approach measure. In this method, the intangible asset 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 in the following circumstances:

1. When the subject intangible asset is relatively new
2. When 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 used in the cost analysis, all cost measurement methods (including reproduction cost new, replacement cost new, or some other cost measurement) should consider a comprehensive cost analysis.

Cost Measurement Procedures

Any cost measurement should consider the following four cost components:

1. Direct costs (e.g., materials and supplies)
2. Indirect costs (e.g., engineering and design expenses, legal 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 opportunity cost during the development period adequate to motivate the development process)

Usually, the intangible asset development material, labor, and overhead costs are easy to identify and quantify. The developer's profit cost component can be estimated using several generally accepted procedures. This cost component is often estimated as a percentage rate of return (or profit margin) on the developer's investment in the material, labor, and overhead costs. The entrepreneurial incentive component is often measured as the lost income that the developer would experience during the replacement intangible asset development period.

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

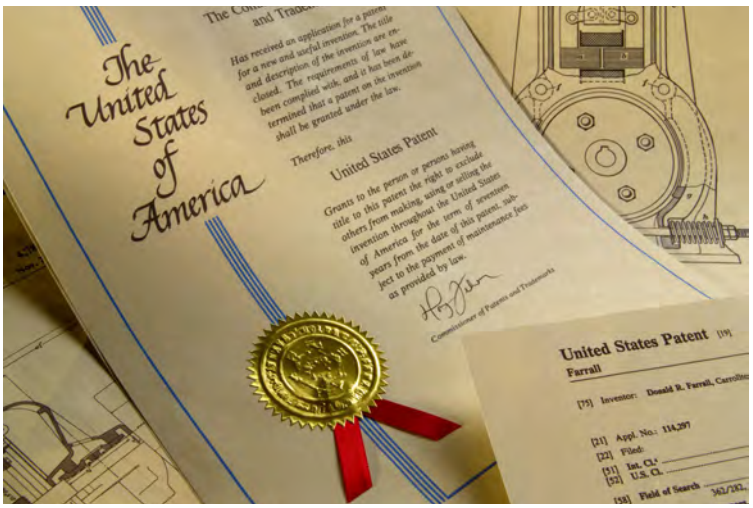
The two years of lost income during the hypothetical patent development period represents the opportunity cost of "making" (i.e., developing) a de novo, noninfringing replacement patent—compared to "buying" the actual patent.

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. While the cost approach represents a different set of analyses than the income approach, there are certain economic analyses included in the cost approach.

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

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

The development cost new (however measured) should be adjusted for any decreases in value due to the following:



1. Physical deterioration
2. Functional obsolescence
3. Economic obsolescence

Physical deterioration is the reduction in asset value due to physical wear and tear. It is unlikely that an intangible asset will experience physical deterioration. Nonetheless, the valuation analyst should always consider the existence of any physical deterioration in a cost approach valuation analysis.

Functional obsolescence is the reduction in asset value due to the inability of the subject intangible asset to perform the function (or yield the periodic utility) for which it was originally designed. The technological component of functional obsolescence is a decrease in asset value due to improvements in technology that make the intangible asset less than the ideal replacement for itself.

External obsolescence is a reduction in asset value due to the effects, events, or conditions that are external to—and not controlled by—the intangible asset current use or condition. 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 asset value due to changes in the neighborhood conditions. This type of obsolescence affects real-estate-related intangible assets such as drilling rights, air rights, construction permits or rights, environmental operating permits, water extraction rights, and so forth.

Economic obsolescence relates to the inability of the intangible asset to generate a fair rate of return on its cost new less physical deterioration and functional obsolescence value indication. Economic obsolescence may affect most types of intangible assets. Economic obsolescence is often analyzed with respect to the ability of the owner/operator to earn a fair rate of return on investment (ROI).

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 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 subject computer software in a more efficient fifth-generation language.

Let's assume that 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 valuation analyst should estimate the amounts (if any) of intangible asset physical deterioration, functional obsolescence, and economic obsolescence. In this estimation, the valuation analyst may consider both the intangible asset expected RUL and actual ROI.

Figure 1 illustrates the consideration of direct and indirect costs (e.g., material and direct 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 developed in, say, the year 2000. The total replacement direct and indirect costs are at $125, as of a 2012 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 2000) direct material and labor development costs.

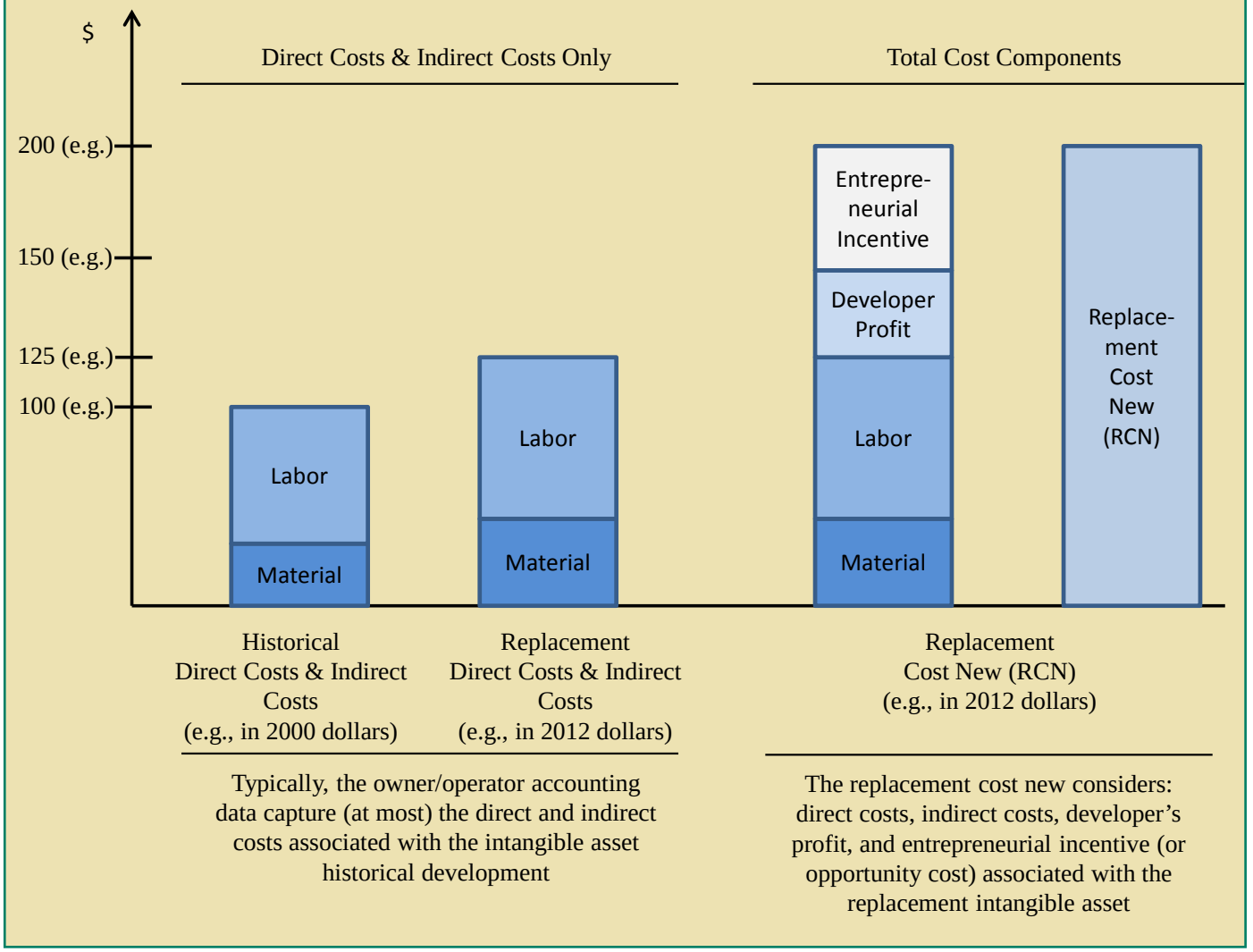
The year 2012 developer's profit and entrepreneurial incentive cost components (illustrated at $75) are then added to the year 2012 direct and indirect cost components (illustrated at $125).

The sum of these cost components ($200) is the year 2012 replacement cost new (RCN).

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

Depreciation is subtracted from the RCN in order to estimate the intangible asset current value (or RCNLD). As illustrated in Figure 2, the three depreciation components include physical deterioration (typically a de minimis consideration for an intangible asset), functional obsolescence, and economic obsolescence.

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



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

$200	replacement cost new (RCN)
– 60	less depreciation (LD)
=$140	replacement cost new less depreciation (RCNLD)

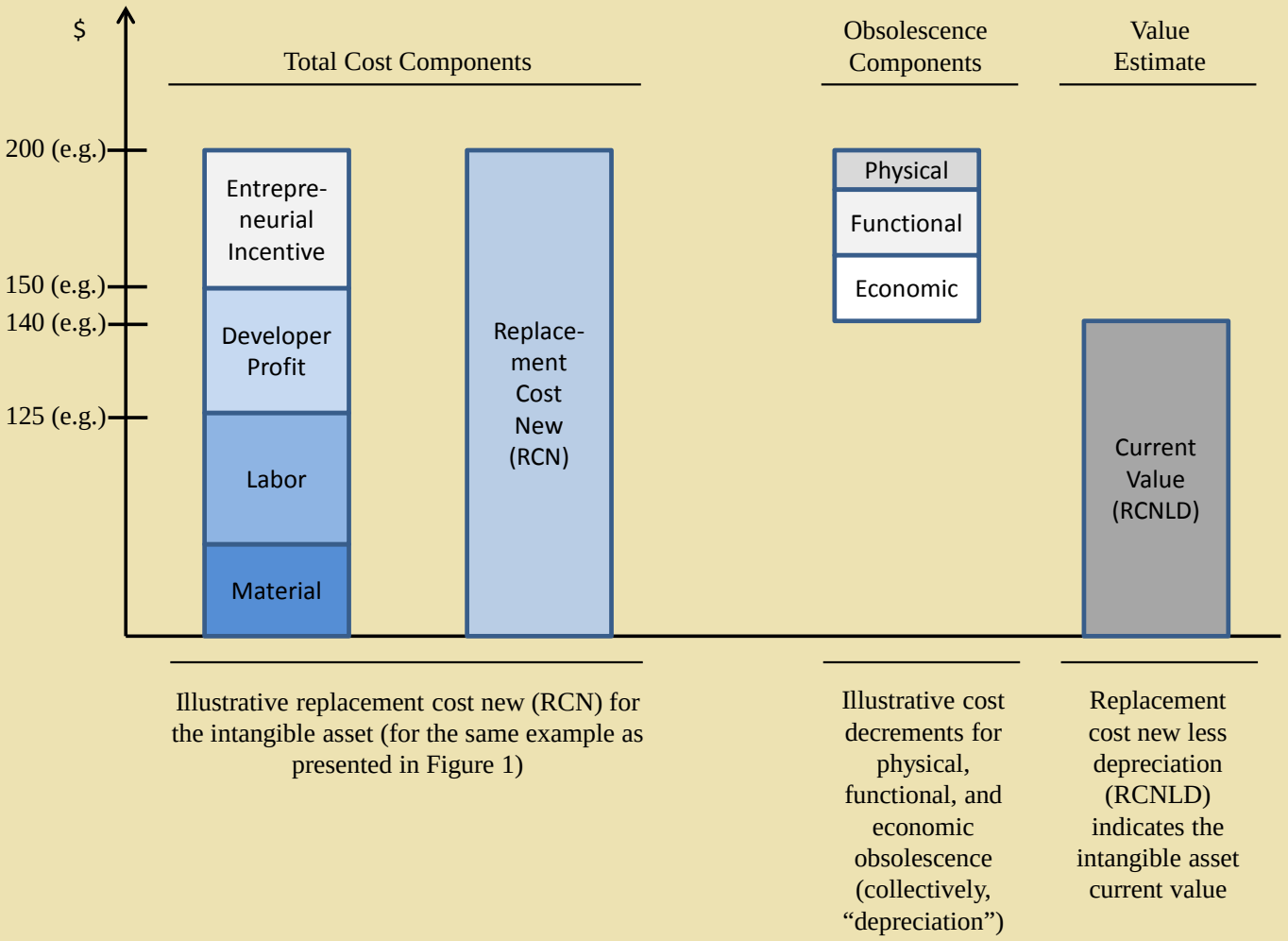
In Figure 2, the current value (or the RCNLD) of the intangible asset is $140. As illustrated in Figure 2, the RCNLD (and not the RCN) provides the cost approach value indication.

A common cost approach formula for quantifying intangible asset replacement cost new is: reproduction cost new – curable functional obsolescence = replacement cost new.

To estimate the intangible asset value, the following cost approach formula is commonly used: replacement cost new – physical deterioration – economic obsolescence – incurable functional obsolescence = value.

Obsolescence is considered 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 considered curable if the cost of curing the intangible asset deficiency is less than the cost of operating the deficient intangible asset. Because it is often caused by factors external to the owner/operator, economic obsolescence is typically incurable.

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



Remaining Useful Life Considerations

After the valuation analyst selects the valuation approaches and methods, the next procedure is to perform the RUL analysis. The estimation of RUL (often called a "lifing analysis") is a consideration of each valuation approach.

In the income approach, a lifing analysis may be performed to estimate the projection period for the intangible asset income subject to either yield capitalization or direct capitalization.

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 reproduction cost new or replacement cost new.

In the market approach, a lifing analysis may be performed to select, reject, and/or adjust "comparable" or "guideline" intangible asset sale or license transactional data.

For each valuation approach, the RUL analysis has an effect on the value indication. The likely expected effect of the RUL on the value indication is summarized below.

Normally, in the income approach, a longer RUL estimate results in a greater value. The income approach value is particularly sensitive to the RUL estimate when the RUL is less than 10 years. The income approach value is not particularly sensitive to the RUL estimate when the RUL is more than 20 years.

Normally, in the cost approach, a longer RUL estimate results in a greater value. That is because

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

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

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

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

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

The analyst typically considers each of these life influence factors in the RUL estimation. Typically, for intangible asset valuation purpose, the life factor that indicates the shortest RUL deserves primary consideration in the RUL estimate.

Physical Depreciation Measurement Procedures

Intangible assets are typically not subject to wear and tear like tangible assets are. However, intangible assets can be "used up" over time. The RUL of the intangible asset may become shorter over time. This decrease in RUL may decrease the intangible asset value.

An intangible asset that is contract-related or otherwise has a legal RUL will typically decrease in value as that RUL 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 an FDA license for a new drug product is $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 is 10 years. On the date that the FDA license is granted, the intangible asset value probably equals the intangible asset 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 valuation analyst will have to decide if the license value decrease is linear over the 10-year life. However, the intangible asset value will typically decrease as its RUL decreases. The FDA license value at the end of year nine will be its RCNLD estimate, and not its RCN estimate.

Some valuation analysts may debate whether this value decrease should be called technological obsolescence instead of physical deterioration. That naming debate is simply a matter of semantics. Regardless of the terminology used, the valuation 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 RUL 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 subject entity's financial statements (historical or prospective), articles of incorporation, books and records, and so on. And, 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 drawing and designs may show wear and tear over time.

The valuation should at least consider the occurrence of physical deterioration during the intangible

asset valuation process. The assembled workforce example in the following functional obsolescence discussion will illustrate the consideration of physical deterioration.

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.

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, the entity will 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 subject workflow 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, the entity will 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 also incur excess facilities overhead costs (e.g., rent, heat, electricity, etc.) to house the excess employees. And, of course, the owner/operator will incur excess costs related to wages, payroll taxes, employee insurance benefits, other employee benefits, and so forth.

In addition to the wrong size, an assembled workforce can experience functional obsolescence related to the wrong mix of employees. For example, if the subject workforce includes employees who have inadequate skills or insufficient experience, then the work will be inadequately performed. The workflow will be inefficient; or, there will be an excessive quality control error or rejection rate; or, customers will be dissatisfied and will not return to the subject business.

If the workforce includes employees who are too highly skilled or experienced, then the owner/operator will incur higher compensation expense (to pay the skilled employees) than is necessary to get the job done. Likewise, the over-qualified 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).

There are two common methods for quantifying functional obsolescence:

1. The excess capital cost method
2. The excess operating cost method

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

Let's say the analyst is asked to value a fairly large internal medicine medical practice, the Doctor Group. The valuation date is December 31, 2011. The local hospital has approached the Doctor Group practice owners with an unsolicited offer to buy the practice assets.

Let's say the Doctor Group has 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 Doctor Group assembled workforce. The valuation analyst decides to use the cost approach and the replacement cost new less depreciation (RCNLD) method.

Exhibit 3 presents a simplified illustration of the RCNLD method valuation of the trained and assembled workforce:

Exhibit 3
The Doctor Group
Trained and Assembled Workforce
Replacement Cost New Estimate
As of December 31, 2011

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 Employees	Hire Employees	Train 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 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 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

As indicated, the valuation analyst estimated the RCN for the 50-person workforce to be $3,652,000. This RCN does not indicate the value of the assembled workforce. The RCN indicates the cost for the owner/operator to replace all 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 3. In the RCN analysis, these costs are typically called direct costs.

The RCN estimate considers all of the other expenses that the owner/operator incurs related to each employee. Those costs are typically called indirect costs. Those costs may include the following employer-paid expenses:

1. Payroll taxes
2. Employee benefits
3. Continuing professional education
4. Annual license and credential fees
5. Uniforms and lab coats
6. Employee parties, gifts, etc.

So, the total annual cost that the owner/operator pays for an employee is called the full absorption cost in Exhibit 3. This full absorption cost includes the following:

1. The compensation paid by the employer to the employee
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. These costs may include the following:

- Advertising for recruiting potential new employees to apply for each position
- Interviewing expenses, background checks, and other pre-employment tests, and placement fees incurred to have the new employee show up on day one
- On-the-job training in the particular position including first month training, first year training, and accumulated continuing education for long-term employees

The valuation analyst expressed the replacement cost components as a percent of the employee full absorption cost. 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 $3,652,000 represents the direct cost and indirect cost components related to the assembled workforce. There are two additional cost components to be considered:

1. Developer's profit
2. Entrepreneurial incentive

In this example, the developer's profit considers the profit margin that a management consulting, human resources outsourcing, or professional staffing firm would earn if the practice retained such a firm to recreate 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 willing buyer of the subject workforce to reimburse it for such out-of-pocket costs. In addition, the staffing firm would expect to earn a profit margin. Otherwise, it 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. Otherwise, the owners would not be motivated to enter into the practice sale transaction.

Let's assume that the valuation analyst surveyed professional firms that are in the business of assembling a fully trained workforce for corporate or institutional employers. Examples of public companies that operate in that industry include Administaff, Inc.; GP Strategies Corp.; and Manpower Inc.

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.

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 valuation analyst has to consider entrepreneurial incentive in the replacement cost new 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. A common 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.

In other words, let's assume that the practice has five intangible assets. Let's assume that it would take, on average, one year to recreate each of the five intangible assets. Finally, let's assume that the Doctor Group earns $1,000,000 of operating profit (typically measured as earnings before interest and taxes) per year.

The analyst should be careful not to assign $1,000,000 as an entrepreneurial incentive opportunity cost to each of the five intangible assets. Whether the Doctor Group had to replace one intangible asset—or all five intangible assets—it would still suffer the same $1,000,000 opportunity cost from not being able to operate during the one-year replacement intangible asset development period.

The multiple assignment of this opportunity cost entrepreneurial incentive would overstate the value of each of the five intangible assets.

Therefore, the analyst should carefully allocate (or "split") the total intangible asset development period opportunity cost among all of the owner/operator intangible assets.

Another common 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 used this second entrepreneurial incentive measurement procedure in the assembled workforce valuation. Let's assume the total elapsed workforce recreation period will be six months. The average investment during the six month period is $2,009,000.

Let's assume the analyst calculates a fair return on investment for the Doctor assets to be 16 percent. This return on investment is often measured as the owner/operator's weighted average cost of capital (WACC). In the 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.

The total entrepreneurial incentive is estimated to be $161,000. This is the fourth replacement cost new cost component.

The total assembled workforce replacement cost new is the sum of all four cost components, or $4,178,000.

Finally, the analyst estimates the cost to replace the 50 current employees with 50 new employees of comparable experience and expertise. Since the replacement cost new 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 3 summarizes the RCN of the assembled workforce. In order to reach a value conclusion, the valuation analyst next has to estimate the RCNLD of the subject workforce. In other words, as in any cost approach analysis, the analyst has to consider if there is any deterioration or obsolescence related to this intangible asset.

The reason for the practice valuation is that a not-for-profit hospital has made an unsolicited offer to buy the Doctor Group. Of course, because of income-tax-related private inurement and excess benefit considerations, the hospital cannot pay more than fair market value for the practice assets.

From the acquisition due diligence, the valuation analyst learns the following facts about the subject assembled workforce:

1. Two of the practice's lab techs (part of the clinical staff) are scheduled to retire in the next year or so.
2. 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.
3. The practice is overstaffed with regard to administrative personnel; in addition to the above-mentioned billing accountant, any typical buyer would eliminate two of the administrative positions.
4. The practice has experienced very low turnover of the clinical staff. Because of the long tenure of these nurses and technicians, they earn an average annual salary of $60,000. 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.

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

In Exhibit 3, the analyst estimates the amount of physical deterioration related to the assembled workforce. Exhibit 4 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.

Exhibit 4
Trained and Assembled Workforce
Physical Deterioration
As of December 31, 2011

Workforce Component	No. of Employees	Average 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	$13,000	$103,000	100%	$90,000
Administrative staff	1	22,400	3,200	25,600	100%	22,400
Total			16,300	128,600		$102,400

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 4 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 (disability). Therefore, these two cost adjustments are appropriately classified as physical deterioration.

The developer's profit and entrepreneurial incentive cost components are based on these same cost component relationships to total direct and indirect cost as are represented in Exhibit 4.

Exhibit 5 presents the analyst's estimate of functional obsolescence related to the assembled workforce. This functional obsolescence estimate considers that the workforce has a superadequacy of two administrative employees.

This functional obsolescence estimate also considers that the 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.

That excess replacement salary causes the average annual full absorption cost to be $15,000 greater than the desired clinical staff replacement cost. And, that excess full absorption cost causes the average replacement cost new (direct 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.

The developer's profit and the entrepreneurial incentive cost components bear the same relationship

Exhibit 5
Trained and Assembled Workforce
Functional Obsolescence
As of December 31, 2011

Workforce Component	No. of Employees	Excess Direct and Indirect Replacement Cost New	Excess Developer's Profit and Entrepreneurial Incentive Components	Excess Total Replacement Cost New	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

to total direct and indirect costs as indicated in Exhibit 3.

Exhibit 6 presents the summary of the RCNLD method analysis for the assembled workforce. This RCNLD analysis concludes the value of (1) the appropriately sized practice workforce and (2) the appropriately experienced practice workforce.

Exhibit 6
Trained and Assembled Workforce
Replacement Cost New Less Depreciation
As of December 31, 2011

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

The depreciation and obsolescence adjustments are appropriate because a willing buyer would not pay the current owner/operator for (1) the value of the employees who are not needed or who are not working and (2) the value of employees who are overcompensated or overqualified to perform the required tasks

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

The above example illustrates the excess capital cost method of measuring functional obsolescence. This method considers the situation where there is a superadequacy in the assembled workforce, such as the following:

1. Too many employees
2. Too highly compensated employees
3. Too highly experienced employees

This excess capital cost method can also be used to quantify excess costs related to superadequate engineering drawings, computer software, laboratory notebooks, training manuals, technical documentation, and many other "backroom" type intangible assets.

The excess capital cost method can also be used to measure functional obsolescence related to an intangible asset inadequacy. In such situations, the functional obsolescence analysis would consider deferred costs, or capital costs that would need to be spent, such as the following:

1. Costs to add additional needed employees
2. Costs to increase the pay of undercompensated employees
3. Costs to add adequately experienced employees

In these instances, the capital cost indicates the costs to cure the functional obsolescence. Typically, these costs still represent obsolescence allowances. This is because a buyer will reduce the price paid to a seller for an assembled workforce if the buyer will have to incur immediate costs to improve the quality of the acquired workforce.

The other common functional obsolescence measurement method is the excess operating cost method. In this method, the analyst estimates the annual expense associated with operating the deficient (inadequate or superadequate) intangible asset.

The analyst will estimate the time period over which that excess operating cost is expected to be incurred. Typically, that time period is the RUL of the intangible asset. The analyst will calculate the present value of the excess operating cost over the expected RUL. This present value represents the amount of functional obsolescence related to that specific deficiency.

Let's assume that the Client Company ("Client") operates a particular computer software system that is written in COBOL (a third-generation programming language). All of its other customer records software and administrative systems software are written in JAVA or C++ (or other fourth- and fifth-generation programming languages).

Client management plans to replace the software system (let's say it's the billing and receivables system) with a new customized software system. However, the IT department does not have the resources to complete that new software development project for the next five years.

In the meantime, Client has to employ a COBOL programmer in order to maintain the current billing system. When a new billing system is installed, this COBOL programmer position will be eliminated. The full absorption cost of the COBOL programmer is $100,000 per year.

The RCN for current billing system is $1,200,000. Also, the RCN for the new customized billing system will be much greater than $1,200,000. To simplify this example, let's assume that there is no physical depreciation related to the computer software.

Using the capitalized excess operating cost method to measure functional obsolescence, the analyst estimated the value of the current COBOL software as summarized in Exhibit 7.

The 2.99 times present value annuity factor is based on a five-year asset RUL and an assumed 20 percent (pretax) present value discount rate.

In theory, if consistent valuation variables are used, the analyst should reach the value conclusion for the intangible asset regardless of which functional obsolescence method is used.

That is, the intangible asset RCNLD should be the same whether the analyst uses the excess capital cost method to measure functional obsolescence or the excess operating cost method to measure functional obsolescence.

In the above examples, the value conclusions are presented before the calculation of economic obsolescence. However, the analysis of economic obsolescence is an integral procedure in each cost approach analysis. The cost approach is not complete until the analyst considers the existence of economic obsolescence.

Economic Obsolescence Measurement Procedures

The economic obsolescence analysis is typically the last procedure in any cost approach 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 generate a fair rate of return on the RCNLD estimate.

If the owner/operator can generate a fair rate of return, then the RCNLD estimate (before an economic obsolescence allowance) is the value indication. However, if the owner/operator cannot generate a fair rate of return, then the RCNLD estimate has to be reduced—by the amount of the economic obsolescence allowance.

The RCNLD estimate should be reduced to the level at which the owner/operator can earn a fair rate of return. That RCNLD estimate adjusted for economic obsolescence is the final value indication.

It is fairly easy for the valuation analyst to identify physical deterioration (if any) in the intangible asset. It is also fairly easy for the valuation 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 then physical deterioration or functional obsolescence. Typically, the causes of economic obsolescence are external to the intangible asset.

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

Exhibit 7
Computer Software
Replacement Cost New Less Depreciation Method

Cost Approach Component		$
Current computer software replacement cost new		1,200,000
Less: Functional obsolescence	$	
annual excess operating cost	100,000	
× present value of annuity factor	2.99	
= capitalized excess operating costs	299,000	299,000
Equals: Replacement cost new less depreciation		901,000
Value of computer software (rounded)		900,000

Exhibit 8
Factors That May Indicate the Existence of Economic Obsolescence

1. The subject entity income approach value is less than the subject entity asset-based approach value.
2. The subject entity market approach value is less than the subject entity asset-based approach value.
3. Owner/operator revenue is decreasing in recent years.
4. Owner/operator profitability is decreasing in recent years.
5. Owner/operator cash flow is decreasing in recent years.
6. Owner/operator product pricing is decreasing in recent years.
7. Industry/profession revenue is decreasing in recent years.
8. Industry/profession profitability is decreasing in recent years.
9. Industry/profession cash flow is decreasing in recent years.
10. Industry/profession product pricing is decreasing in recent years.
11. Owner/operator profit margins are decreasing in recent years.
12. Owner/operator returns on investment are decreasing in recent years.
13. Industry/profession profit margins are decreasing in recent years.
14. Industry/profession returns on investment are decreasing in recent years.
15. Industry/profession competition is increasing in recent years.

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. There are several conditions that may indicate the existence of economic obsolescence. The analyst should particularly consider intangible asset economic obsolescence if any of these owner/operator conditions exist. These conditions are listed in Exhibit 8.

None of these factors specifically measures the amount of economic obsolescence. However, the existence of one or more of these factors may indicate the existence of economic obsolescence. In order to measure economic obsolescence, the analyst will consider the following factors:

1. Owner/operator-specific factors
2. Intangible-asset-specific factors

Procedures to Measure Economic Obsolescence

Most of the analyses 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.

The comparative basis may also 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.

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

The valuation analyst may review owner/operator 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 valuation analyst may consider the owner/operator data and documents on various comparative bases, including 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 subject entity's practical or normal production capacity

The valuation analyst may analyze owner/operator financial data in order to identify the causes of the economic 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 valuation analyst is looking for some external factor that may cause the owner/operator to earn less than a fair rate of return on investment.

Economic Obsolescence Illustrative Example

Let's continue with example of the Doctor Group. The analyst concluded an RCNLD—including functional obsolescence—value indication for the assembled workforce. In order to reach a final cost approach value conclusion, the analyst has to consider economic obsolescence.

Let's assume that the analyst accumulates comparative financial and operational data regarding the Doctor Group. These comparative data are summarized in Exhibit 9.

Exhibit 9
Trained and Assembled Workforce
Selected Economic Obsolescence Data
As of December 31, 2011

Item	Financial or Operational Performance Metric	LTM Ended 12/31/11	Benchmark Measure	LTM Percent Shortfall	Benchmark Comparison Reference Source
1	Average collected revenue per physician	$340,000	$420,000	19%	2011 regional internal medicine group average
2	Number of support staff per physician	4.0	3.2	25%	2011 regional internal medicine group average
3	Average salary per physician	$180,000	$220,000	18%	2011 regional internal medicine group average
4	Annual growth rate in the practice revenue	3.5%	4.5%	22%	actual subject practice average for 2006-10
5	Profit contribution per physician (pre-MD comp)	$200,000	$280,000	29%	2011 regional internal medicine group average
6	Profit contribution margin (pre-MD comp)	59%	67%	12%	2011 regional internal medicine group average
7	Average patients seen per physician per day	8.2	10	18%	the 2011 subject practice budget
8	Average revenue billed per patient visit	$80	$100	20%	the 2011 subject practice budget
9	Return on the practice average assets	10%	12.5%	20%	actual subject practice average for 2006-10
10	Return on the practice average equity	20%	25%	20%	actual subject practice average for 2006-10
	LTM percent shortfall indications:				
	– mean		20.3%		
	– median		20.0%		
	– mode		20.0%		
	– trimmed mean		20.3%		
	– trimmed median		20.0%		
	Economic obsolescence indication		20%		

Based on the comparative financial and operational data, the valuation analyst concluded that the Doctor Group is experiencing economic obsolescence of about 20 percent.

Unless there is a specific economic obsolescence calculation related to an individual intangible asset, the analyst will apply the 20 percent economic obsolescence allowance to all intangible assets valued using the cost approach.

With regard to the assembled workforce, the allowance for economic obsolescence is summarized in Exhibit 10.

Exhibit 10
Trained and Assembled Workforce
Economic Obsolescence Allowance
As of December 31, 2011

	Cost Approach Analysis	Cost Component
	Replacement cost new less depreciation	$3,843,400
Times:	Selected economic obsolescence percent	20%
Equals:	Economic obsolescence allowance (rounded)	$768,700

Concluding the Value Indication

By this point in the analysis, the valuation analyst has performed each of the following procedures:

1. Concluded that the application of the cost approach is appropriate for the subject intangible asset
2. Confirmed that adequate current cost information is available to perform a cost approach analysis
3. Selected the appropriate measurement measure for the intangible asset current cost
4. Included all appropriate cost components in the current cost measurement
5. Identified and quantified any necessary allowance for physical deterioration
6. Identified and quantified any necessary allowance for functional obsolescence
7. Identified and quantified any necessary allowance for economic obsolescence

The only remaining procedure is to subtract all deprecation and obsolescence allowances from the current cost measure to conclude a value indication. To illustrate this final procedure, let's complete the assembled workforce valuation. This assembled workforce value conclusion procedure is illustrated in Exhibit 11.

Exhibit 11
Trained and Assembled Workforce
Valuation Synthesis and Conclusion
As of December 31, 2011

Cost Approach Analysis	Cost Component
Replacement cost new	$4,178,000
less: Physical deterioration allowance	128,600
Less: Functional obsolescence allowance	206,000
Less: Economic obsolescence allowance	768,700
Equals: Replacement cost new less depreciation	3,074,700
Assembled workforce value (rounded)	$3,100,000

The analyst would conclude the defined value for the assembled workforce, as of December 31, 2011, as $3,100,000.

Ideally, the analyst would also have income approach and market approach value indications to correlate to the cost approach value indication. However, in an intangible asset valuation, it is relatively uncommon for the valuation analyst to be able to synthesize multiple value indications.

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Business Valuation Services

- *Business enterprise valuations*
- *Debt or equity security analyses and valuations*
- *Intangible asset valuations*
- *Intellectual property valuations*
- *Income-producing and special purpose property appraisals*

Forensic Analysis Services

- *Economic damages and lost profits calculations*
- *Reasonableness of executive compensation analyses*
- *Tangible/intangible property intercompany transfer pricing*
- *Forensic analysis and expert testimony*
- *Intellectual property infringement/royalty rate analyses*

Financial Opinion Services

- *Fairness opinions*
- *Solvency/insolvency opinions*
- *Fair market valuation opinions*
- *Fraud and corporate governance opinions*
- *ESOP valuation and adequate consideration opinions*

The Thought Leader

Founded in the 1960s, Willamette Management Associates is the recognized thought leader in business valuation, forensic analysis, and financial opinion services. Our clients range from family-owned companies to Fortune 500 corporations. We provide business valuations, forensic analyses, and financial opinions related to transaction pricing and structuring, tax planning and compliance, and litigation support and dispute resolution.

Business Valuation Services

Our business, security, and property valuation services relate to: ESOP employer stock purchase or sale; the purchase or sale of a business; purchase price or sale price allocation; federal income, gift, and estate tax; state and local property tax; bankruptcy and reorganization; refinancing and restructuring; intellectual property transfer; intergenerational wealth transfer; like-kind exchange; and fair value accounting and financial reporting.

Forensic Analysis Services

Our forensic analysis services include: reasonableness of shareholder/executive compensation, intellectual property transfer price, forensic accounting and fraud investigation, commercial litigation, economic damages and lost profits, intellectual property infringement, eminent domain and condemnation, shareholder oppression/dissenting shareholder appraisal rights actions, and breach of contract or noncompete agreement claims.

Financial Opinion Services

Our financial opinion services include: fairness opinions for mergers and acquisitions; solvency and fraudulent conveyance opinions for highly leveraged, dividend distribution, or financing transactions; fair market valuations regarding the corporate governance of transaction, financing, reorganization, and intercompany transfers; and excess benefit/private inurement opinions for not-for-profit entity transactions.

For More Information

For more information, visit our website at www.willamette.com or contact a managing director at our nearest office.

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