Economic Obsolescence and Fair Value:
Measurement and Allocation of Fixed Assets

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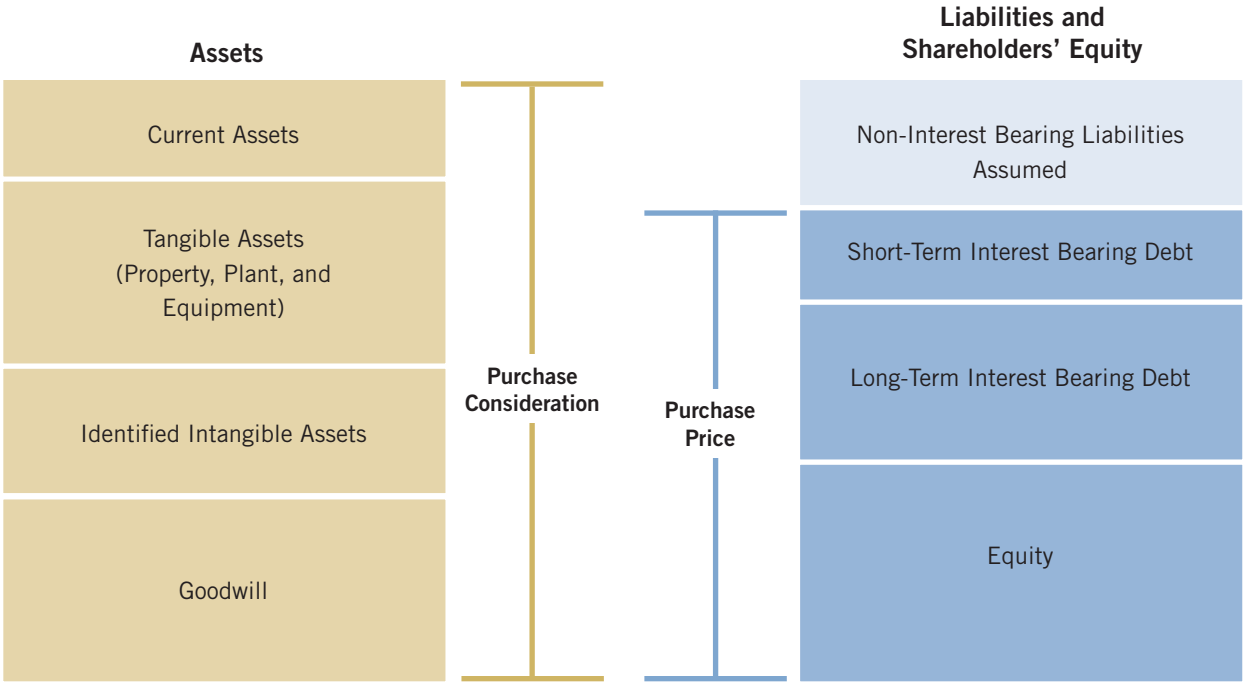
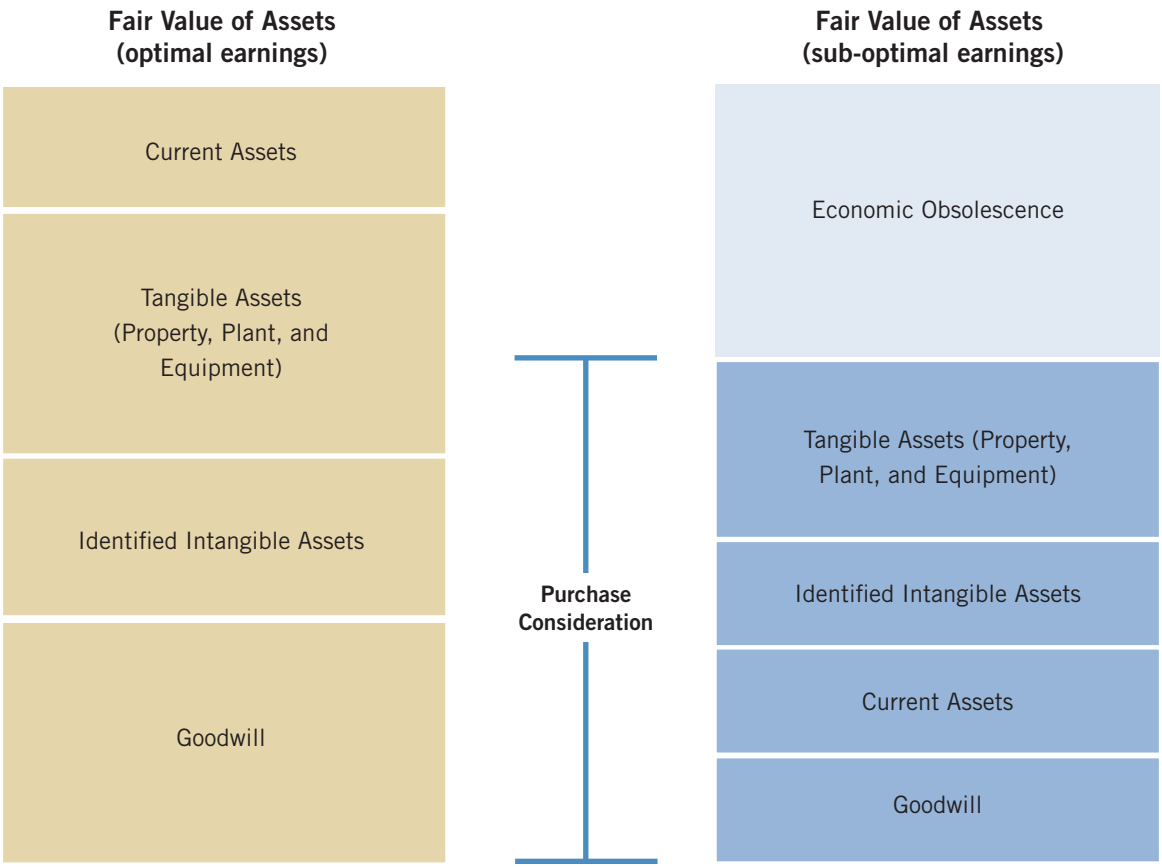
Business combinations, goodwill impairment (Step Two), fresh start accounting, and recapitalizations are major events for companies. All of these events also necessitate a fair value measurement of a company's assets and liabilities. Fair value measurement has emerged as an important topic in accounting in recent years and it is essential that companies and their valuation professionals can appropriately measure fair value in accordance with the principals established by the Financial Accounting Standards Board ("FASB"). One of the most complex and difficult situations surrounding fair value measurements is the existence of economic obsolescence. Economic obsolescence represents factors external to an asset (or group of assets) that reduce the value of the asset(s). In the context of U.S. GAAP and fair value accounting, this represents a situation where the fair value of the asset is less than what it would be if the earnings associated with the assets were optimal. Cash flows would be considered optimal when they meet or exceed a level where the rate of return is consistent with market participant expectations for assets of a similar nature. Economic obsolescence is most often present in periods of declining profits or when industry factors have caused a change in the supply and demand for a company's products, which has negatively impacted revenue or operating margins. Examples include a luxury casino built in a remote location away from other amenities, a manufacturing plant making tape recorders, and a U.S.-based semiconductor manufacturer competing against lower cost international competition. Economic obsolescence can also surface if governmental regulations change, requiring capital expenditures, restrict production, or require ongoing expenses—imagine an offshore drilling platform subject to government restrictions after an oil spill.

According to Houlihan Lokey's 2012 Purchase Price Allocation Study, of the 511 transactions for which the necessary amount of publically disclosed information was available, 95% allocated some of the purchase consideration to goodwill and three recorded negative goodwill. In situations where a comparison of the carrying value of the assets compared to the purchase consideration would imply that goodwill is negative, zero, or minimal, a crucial factor is the appropriate quantification of economic obsolescence as it relates to the acquired assets. In such cases, the appraiser should confirm whether all assets or liabilities are being considered, and whether the carrying value fails to recognize a decline in assets value due to economic obsolescence. The purpose of this paper is to discuss the notion of economic obsolescence and how to properly quantify it using multiple valuation approaches in the context of fair value. The graphic below illustrates a typical allocation of the assets acquired, liabilities assumed, and residual goodwill in the context of a healthy acquisition.



When the total purchase consideration is closer to or below the carrying value of the assets, it is likely that economic obsolescence is present, as discussed above. This is generally due to the fact that the earnings of the acquired business operation do not support the value of the assets that could be realized if the assets were achieving their optimal cash flow generation. Said another way, while it may still make economic sense to run the business as it stands, it is unlikely that an investor would make a Greenfield investment in the same business (unless drivers of economic obsolescence were eliminated e.g., geographic limitations). In these cases relationships similar to the table presented below occur.



As can be seen in the figure above, economic obsolescence results in a reduction in value across all but the most realizable assets (current assets). The role of the valuation professional is to properly quantify and allocate the economic obsolescence to conclude on the appropriate fair value of the acquired assets. This allocation of value impacts the acquirer's financial statements going forward and it is essential to ensure the assets are valued correctly the first time.

Houlihan Lokey takes an integrated and cooperative approach to valuation, which is essential when dealing with economic obsolescence, where the value of all of the assets is interrelated to the value of the business. Our team consists of professionals with experience across the valuation disciplines of real property, personal property, and financial valuation. We have significant experience quantifying economic obsolescence in a variety of industries and have successfully performed allocations in situations with little goodwill, no goodwill, and negative goodwill, e.g., a bargain purchase.

The first step in properly assessing a situation where evidence of economic obsolescence exists is determining the purchase consideration or enterprise value, as appropriate. In the context of a business combination, the purchase consideration is considered the appropriate level of value for considering the

business as a whole, particularly when the sale was an orderly transaction between market participants. In the absence of a negotiated purchase, such as a debt for equity exchange, an independent enterprise valuation is required to determine the fair value of the acquired company (i.e., total purchase consideration allocable to the acquired assets and liabilities). In the case of fresh start accounting, the agreed upon emergence value may be the appropriate value.

Another important consideration is ensuring that the valuation is done effectively and appropriately to meet the scrutiny of the company's auditors. When assessing the appropriateness of fair value, auditors will ensure that the valuation professionals are qualified to perform the valuation. Relevant qualifications include experience in the appropriate discipline (i.e., personal property, real property, or financial); accreditations (i.e., CFA, MAI, ASA, MRICS, etc.); and in certain cases licenses (i.e., state certified general real estate appraisers). Further, the auditors will confirm that the valuation professional has exercised all due diligence and applied the appropriate methodologies consistent with U.S. GAAP. Houlihan Lokey takes a proactive approach to address these issues, and in the following paragraphs we present a case study of such an analysis as it relates to fresh start accounting.

Case Study – Gaming and Hospitality

In our case study, an ambitious gaming resort development was completed at a cost of over $2 billion. The casino opened, and after a year of quarterly losses, was forced to file for bankruptcy protection. Houlihan Lokey was retained to conclude upon the fair value of the assets as of the reorganization date.

In connection with the bankruptcy, the enterprise value of the company was estimated to be $600 million, indicative of significant economic obsolescence in comparison to the investment made in the operations. The table below shows the closing balance sheet as of the valuation date and the opening balance sheet reflective of the adjustments made in the analysis.

($ in millions)	Adjusted Closing Balance Sheet	Debt Transaction Closing Adjustments	Fair Value and Other Opening Adjustments	Pro-Forma Opening Balance Sheet	
Assets					
Total Current Assets	42.000	-	1.500	43.500	
Net Property and Equipment	1,809.865	-	(1,179.865)	630.000	HL Analysis
Intangible Assets	-	-	10.000	10.000	HL Analysis
Other Non-Current Assets	21.500	-	-	21.500	HL Analysis
Total Assets	1,873.365	$0	(1,168.365)	$705.000	
Liabilities					
Total Current Liabilities	1,405.000	(1,300.000)	-	105.000	
Long-Term Debt	30.000	350.000	-	380.000	EV = $600m
Total Liabilities	1,435.000	(950.000)	-	485.000	EV = $600m
Total Equity	663.000	(443.000)	-	220.000	EV = $600m
Total Liabilities and Equity	$2,098.000	($1,393.000)	-	$705.000	
Debt Free Net Working Capital	($2.000)			($2.000)	

Quantifying Economic Obsolescence

Before discussing the specifics of economic obsolescence, a brief discussion of the three approaches to value is warranted to understand why it is necessary to quantify economic obsolescence. The three approaches are the cost approach, the market or sales comparison approach, and the income approach. Inherent in all three approaches are three forms of depreciation—physical, functional, and economic. The following paragraphs briefly describe the approaches and how they account for these forms of depreciation.

The cost approach is based upon the principle of substitution, which assumes that a prudent investor would not choose to pay more for an asset than the cost for which they could obtain a similar substitute or one of equivalent utility. There are several advantages to using the cost approach. It provides a method to estimate value when secondary market transactions or income information are not available or attributable to individual assets. The cost approach is also a cost effective method of estimating value when dealing with large populations of assets. Further, the cost approach is useful when determining the appropriate value to allocate to a specific asset within a larger income generating enterprise (e.g., the building improvements and furnishings of a large casino operation). The cost approach's primary weakness is that it can be difficult to quantify all forms of economic obsolescence. Because the cost approach does not incorporate secondary market information or the income characteristics of an asset, it overstates the value of an asset when economic obsolescence is present. In applying the cost approach, the replacement cost new ("RCN") of an asset is determined first. The RCN is then depreciated over the economic life of the asset to estimate physical obsolescence. Functional obsolescence, if present, can be measured by the cost approach using various methods, such as the excess operating costs method or the excess capital cost methods. Various methods exist to estimate economic obsolescence via the cost approach, such as inutility, but in the absence of an income approach analysis these methods can be imprecise or fail to quantify the full extent of the economic obsolescence. Some indication of business value is required (i.e., enterprise value, purchase consideration, etc.) to fully quantify this economic obsolescence.

The Cost Approach	
Replacment Cost New	
less:	Physical Depreciation
Replacement Cost New less Depreciation	
less:	Functional Obsolescence
	Economic Obsolescence
Fair Value	

The market approach, which is sometimes referred to as the sales comparison approach, estimates value based on what other participants in the market have paid for reasonably similar assets that have been sold within a reasonable period from the valuation date. Adjustments are made to compensate for differences between the reasonably similar assets and the asset being valued, and may include the age, location, size, condition, capacity, and changes in market conditions, among others. This approach

has many advantages, the foremost being that it is based upon realized transactions between market participants and as such, should be reflective of all forms of obsolescence. Another advantage of the market approach is that it is flexible and can be applied just as successfully to sales of an entire business operation as it can to a piece of real property or a single machine. The market approach's major weaknesses are that it cannot be applied in the absence of publically available sales data and that it fails to allocate value to the components of a business. To do this, further analysis is required.

The income approach estimates value based on the net economic benefit (i.e., net operating income or cash flows) to be received over the life of the asset, discounted to present value. The discounting process uses a rate of return that accounts for both the time value of money and investment risk factors. There are various methods applied under the income approach, including the discounted cash flow method, the excess earnings method, the relief from royalty method, the lost profits method, and the Greenfield method. The primary strength of the income approach is that, because it is based upon earnings, it is generally the most relevant to the motivations of market participants. The income approach relies upon assumptions, such as discount and growth rates, and similar to the market approach, it fails to allocate value to the components of a business, because revenue and cash flow information are generally not available at the individual asset level.

The Three Approaches to Value

COST APPROACH

Strengths	Weaknesses
• Broad applicability • Useful for allocation	• Does not fully quantify economic obsolescence

MARKET APPROACH

Strengths	Weaknesses
• Based on actual sales • Can apply to any asset • Reflects economic obsolescence	• Limited data available • Fails to allocate value

INCOME APPROACH

Strengths	Weaknesses
• Closely tied to market participant motivations • Reflects economic obsolescence	• Sensitive to assumptions • Fails to allocate value

As discussed above, economic obsolescence is a factor in all three approaches to value, but it is the need to allocate value to all identifiable assets in the context of financial reporting, and the resultant application of the cost approach, which gives rise to the need to discretely quantify it. In our discussion of the case below, we walk through the procedures to properly quantify and allocate economic obsolescence.

In comparison to a healthy company, when significant economic obsolescence exists, the allocation of fair value to the assets is generally heavily weighted towards the Property, Plant, and Equipment ("PP&E")

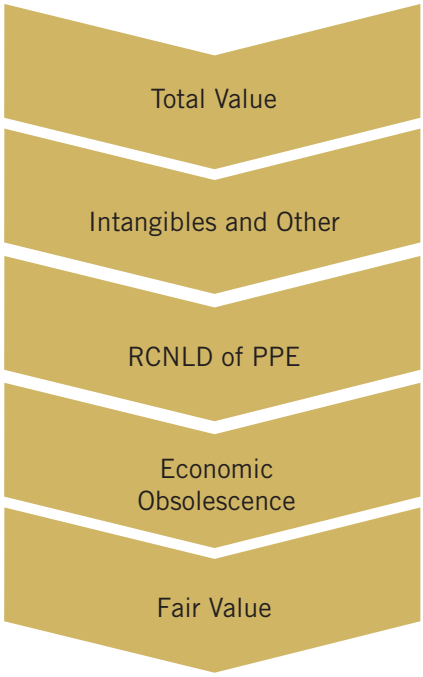
because these assets have a known and usually significant cost basis and realizable secondary markets. Nonetheless, when determining the fair value of the PP&E with the existence of economic obsolescence, the analysis is very similar to that under normal circumstances until the point of quantifying the economic obsolescence. The real and personal property are valued using both the cost and market approaches as applicable to arrive at an indication of Replacement Cost New less Depreciation ("RCNLD"). RCNLD is equal to fair value in the absence of any other forms of obsolescence, but turning to our case where the enterprise value of the operation is $600 million compared to a carrying value of the PP&E of approximately $1,800 million, it is evident that economic obsolescence exists. The quantification and allocation of that obsolescence poses both the largest challenge and greatest risk of error in an analysis of this type.

After concluding upon the RCNLD of the PP&E, the next step is to determine the value of all other identifiable assets to properly determine the amount of obsolescence applicable to the PP&E. In order to do this one must consider the debt-free net working capital; the identifiable intangible assets; and any other short term obligations or other assets and liabilities. Debt-free net working capital includes cash, but excludes short-term obligations, current portions of long term debt, and liabilities.

After this the intangible assets must be considered. In our study the intangible assets considered were lease intangibles, the property name, and player relationships. The lease intangibles include origination value, lease in place value, and above/below lease value. Lease origination costs include Tenant Improvements, Leasing Commissions, and Legal and Marketing Costs as of the Valuation Date. These costs are estimated at the market rate and then amortized over the remaining term of each lease. The value of the lease in-place considers all uncollected revenues should the property's tenants be replaced as of the valuation date. The uncollected revenues include market rent that would be lost in the downtime between the existing lease and the new lease. The primary method to value an above/below lease position is based on the income approach, whereby the difference between contract rent and market rent is calculated for each remaining year of the lease. The future annual differences are then discounted back to the present value at an appropriate discount rate. If terms are currently at market, an above/below position does not exist. All lease intangibles are valued using market-based assumptions and therefore reflect all obsolescence.

The player relationships, similar to other relationship-type assets, are valued using an excess earnings method. This method estimates the value of an intangible asset by quantifying the amount of residual (or excess) cash flows generated by the asset and discounting those cash flows to the present. The method substantially resembles a "traditional" financial projection for a company, which includes revenues, costs of goods sold, operating expenses, and taxes projected for the next several years based on reasonable assumptions. Unlike a traditional financial projection, however, the excess earnings methodology requires the application of contributory asset charges. These charges represent the return on and of all contributory assets, and are applied in order to estimate the "excess" earnings generated by the subject intangible asset. Contributory asset charges typically include payments for the use of working capital, tangible assets, and other intangible assets. In the application of the excess earnings method, the RCNLD of the PP&E is utilized to determine the charge to take against the earnings when calculating the player relationship value. In this way, the obsolescence applicable to the relationships is fully quantified and a true fair value for the player relationships is determined.

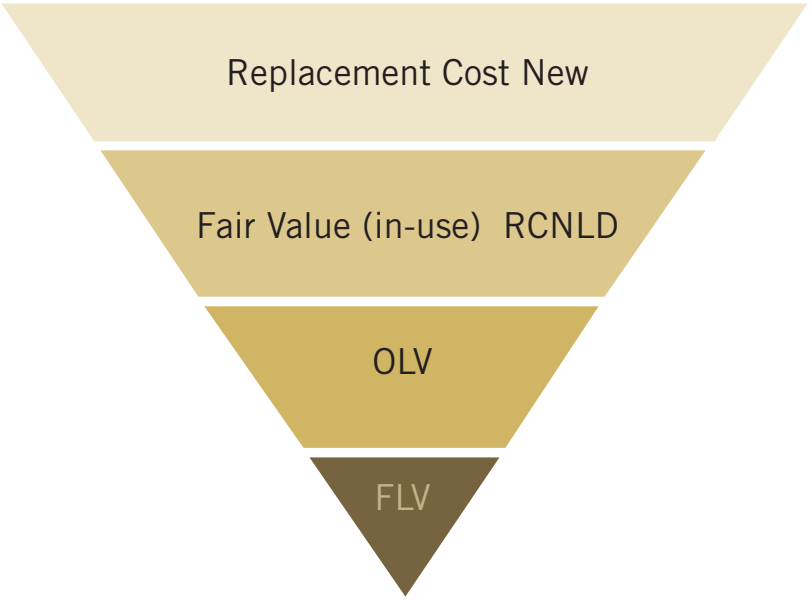
In this analysis the property name was considered as a potential intangible asset, but given the short operating history of the property under its current name and the poor financial results, it was determined there was no value in the property name.



- **Determine Enterprise Value or Purchase Consideration**
- **Determine value of current assets, liabilities, and intangibles**
- **Determine the RCNLD of the PP&E**
- **Quantify and Allocate Economic Obsolescence**
- **Conclusion of Fair Value**

Finally, when the above values have been determined, one can compare the enterprise value to the net assets and liabilities to determine the fair value attributable to the PP&E. At this point it is necessary to consider the orderly liquidation value of the PP&E. Orderly liquidation value is defined as the amount "… that typically could be realized from a liquidation sale, given a reasonable period to find a purchaser (or purchasers), with the seller being compelled to sell with a sense of immediacy on an as-is where-is basis." In the context of fair value, it is important to note that orderly liquidation value ("OLV") is the lowest appropriate level of value because it represents the net realizable value of the asset, which is an exit price in the most advantageous market for the asset when the earnings of the asset do not support a higher value. Forced liquidation value ("FLV") is a lower level of value. FLV is generally not relevant to estimates of fair value, as it represents an immediate or "fire sale," which is not consistent with the concept of the most advantageous market.

[1] Machinery and Technical Specialties Committee of the American Society of Appraisers, Valuing Machinery and Equipment: The Fundamentals of Appraising Machinery and Technical Assets, Third Edition, 2011.



It is essential that consideration is given to the market approach in determining orderly liquidation value. Market observations represent Level 1 or Level 2 inputs as defined in FASB ASC820 and provide the best evidence of the true value that could be realized for an asset in a sale to market participants. In the case of real property this means looking at comparable sales of land and improved properties and giving consideration to the exposure time appropriate for orderly liquidation. For personal property, auction sales of assets are a good source of liquidation-level value indications. In either case the costs to sell must be considered. Costs to sell include broker fees, auctioneer fees, legal fees, and marketing costs, among others. The OLV less costs to sell establishes the minimum value of the PP&E, as a rational investor would choose to liquidate the assets as opposed to hold them if the long-term value of the assets is less than that which could be realized in a short-term liquidation. This is consistent with the principle of an exit price in the most advantageous market, as discussed previously.

We researched land sales to determine a market supported value for the land. For the equipment of the casino, such as furniture, slot machines, and kitchen equipment, we researched used equipment sales, new equipment prices, and equipment auction prices to determine appropriate OLV levels for the assets. We also held discussions with auctioneers familiar with the industry to verify the reasonableness of our OLV conclusions and to understand liquidation costs. Once the OLV of the assets are determined, any functional or economic obsolescence that can be quantified independently of the implied overall business value must be considered, including excess operating costs, excess capital costs, or inutility. It is important to quantify the OLV prior to applying functional and economic obsolescence so as not to undervalue the asset(s). We did not identify other forms of obsolescence.

After all other forms of obsolescence have been quantified, the economic obsolescence implied by the business value is then applied to the assets on a pro-rata basis. This is done via an iterative process, whereby the total obsolescence applicable to the PP&E is determined and then applied to the assets on a

pro-rata basis, based upon the RCNLD of each asset. It is imperative that this process is done in iterations to ensure that the OLV of each asset is considered. In the first iterations, the economic obsolescence is applied to all assets, but only to the extent that the obsolescence does not result in the fair value of the asset being less than OLV. Because of these floors, all of the obsolescence will not be applied and some residual obsolescence will exist. It is then necessary to repeat the process including only assets which have a fair value greater than their OLV after the initial application of obsolescence. This iterative process will be replicated until either all of the economic obsolescence is applied or all assets have reached their OLV. In the case that indications of economic obsolescence still exist but all of the PP&E is being valued at its OLV, the value of the business may need to be revisited, or the possibility of a bargain purchase may exist. It should be noted that bargain purchases are extremely rare, as it would not be anticipated that a seller would divest of their assets to a market participant for less than they could realize for a liquidation of the assets. The table below shows the application of economic obsolescence to our subject PP&E. Note that the obsolescence is not applied to all assets and is applied at a different rate to the various categories based upon the OLV research and iterative process described above.

($ in millions)

Consolidated	**Net Book Value**	**Estimated RCNLD**	**Economic Obsolescence**	**Estimated Fair Value**
Land	$35.000	$40.000	$0.000	$40.000
Land Improvements	19.500	14.900	10.900	4.000
Building	1,500.000	1,750.000	1,288.000	462.000
Tenant Improvements	0.000	25.000	0.000	25.000
Slot Machines	27.300	33.000	23.000	10.000
Computer Equipment	26.900	30.000	20.800	9.200
Gaming Equipment	65.000	82.000	58.500	23.500
Furniture, Fixtures and Equipment	125.000	134.000	89.000	45.000
Vehicles	0.165	3.000	2.700	0.300
Construction in Progress	11.000	11.000	0.000	11.000
Total	**$1,809.865**	**$2,122.900**	**$1,492.900**	**$630.000**

Once the fair value of the fixed assets has been determined, the analysis is essentially complete. All that remains is to compare the population of valued assets and ensure that the total concluded values reconcile to the enterprise value. The table below shows the concluded values of the assets and liabilities of the subject. The key points to note are that there is no residual goodwill, the total of the assets and liabilities is equivalent to the enterprise value, and the PP&E are valued significantly below their carrying value due to economic obsolescence.

($ in millions)	**Fair Value**
Debt Free Net Working Capital (Including Cash)	($2.000)
Net Property and Equipment	$630.000
Short-Term Obligations	($28.000)
Net Other Assets (Liabilities)	($10.000)
Intangible Assets	
Lease-Related Intangibles	$6.000
Player Relationships	$4.000
Work Force	$4.000
Goodwill (Excluding Work Force)	($4.000)
Total Intangible Assets and Goodwill	$10.000
TOTAL	**$600.000**

The Big Picture

The correct sequence and application of valuation methodologies as described above are essential in arriving at the appropriate fair value of assets with the existence of economic obsolescence. Failure to adhere to this methodology can result in significant problems, for the valuation professional if their mistakes result in delays for their client's audit and financial statements, but more seriously for their client if mistakes are made and inappropriate values are booked in the company's financials going forward. Because the fair value measurements have a direct impact on a company's accounting depreciation, inappropriate fair value measurements can have a direct bottom line impact on earnings (i.e., earnings per share).

One of the most significant potential mistakes is not considering orderly liquidation value as the lowest possible value of the PP&E. In the past, many valuation professionals relied on a "plug" method to determine the value of PP&E in a purchase price where economic obsolescence was present. In applying this method, one simply looks at the purchase price and subtracts the value of the intangibles and net other assets and liabilities. The residual value is then the value of the PP&E and is allocated among the PP&E. While at first this may sound similar to the process described above, the key difference is the consideration of the OLV of the PP&E. Each individual PP&E asset must be assessed for OLV to ensure that no asset is undervalued. This is important because the liquidation value of a piece of land is vastly different than that of a piece of machinery or furniture in relations to its historical cost and carrying value. Applying too much obsolescence to certain assets or too little to others has a direct impact on the asset's value going forward and as such the amount of depreciation recorded. Beyond this, overvaluing an asset can result in future impairments, which could necessitate unnecessary fees for a company and a future negative earnings event.

The important thing to note is that negative consequences can be mitigated or avoided entirely by getting the fair value right the first time around. Houlihan Lokey's integrated and cooperative approach to valuation provides confidence that we get to the right answer the first time around. Our team of valuation professionals has significant experience dealing with economic obsolescence and brings a collaborative approach to working with clients to provide a positive experience and the correct results.