Measuring Economic Obsolescence

John S. Dritt
Senior Manager Property Tax
Southwest Airlines Co.
Dallas, TX
john.dritt@wnco.com

Charles Oeler, CMI
Senior Managing Consultant
Paradigm Tax Group
Houston, TX
coeler@paradigmtax.com
Economic Obsolescence

• In any valuation, economic obsolescence ("EO") is an often difficult form of depreciation to analyze, quantify, and explain.

• There are varying levels of sophistication, understanding, and use of EO in the valuation industry. Although dialogue on EO has existed for years, interest in EO has increased recently.

• Economic obsolescence is described by the American Society of Appraisers as “a form of depreciation where the loss in value or usefulness of a property is caused by factors external to the property.”
Economic Obsolescence

These may include such things as the economics of the industry; availability of financing; loss of material and/or labor sources; passage of new legislation; changes in ordinances; increased cost of raw materials, labor or utilities (without an offsetting increase in product price); reduced demand for the product; increased competition; inflation or high interest rates; or similar factors.”

Causes of Economic Obsolescence

**Environmental Factors** - Need for New and costly Pollution Control Equipment.

**Legislation** – Product Safety Compliance

**Regulatory Actions** – Unfavorable change in Union Rules

**Taxation** – Favorable tax law now becomes Unfavorable
Causes of Economic Obsolescence

**Competition** – Global workforce less costly, increases product supply

**Litigation** - Legal actions by Courts/Others affecting assets

**Economic Factors** – Weakness in the Economics of the Industry, Price Fluctuations

**Customer Base** – Shrinking Customer base
Causes of Economic Obsolescence

**Financing Issues** – High interest rates, Unavailability of Financing

**Demand** – Reduced demand for the product / Service

**Cost of Production** - Loss of Raw Material, Labor Sources, and or Utilities
Economic Obsolescence
The Cost Approach

• “The most economical new substitute property may have many advantages over an old property, such as longer life expectancy, lower annual disbursements for operation and maintenance, increased receipts from sale of product or service. The depreciation deduction of the hypothetical new substitute property should be a measure in money terms of all of these disadvantages of the existing old property.”

Economic Obsolescence
The Cost Approach

• “The Cost Approach must take into consideration all physical depreciation as well as any functional and external obsolescence that is present in the subject assets, as would a prudent investor in arriving at a reasonable estimate of market value.”

What is “Economical New Substitute Property?”

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Replacement Cost – The cost to replace an existing property with a property of equivalent utility as of a particular date.

*If SWA had a chance to serve the same routes it flew in 2012 all over again, what fleet mix would we use?*

- Newer, more efficient, more profitable aircraft?
- Perhaps more expensive aircraft?
- Understanding that the economics of these more profitable aircraft would pay off.
- The replacement cost new only captures the capitalized cost, not the operational cost benefit.
How do we measure the “Depreciation Deduction of the Hypothetical New Substitute Property?”

“The most economical new substitute property may have many advantages over an old property, such as longer life expectancy, lower annual disbursements for operation and maintenance, increased receipts from sale of product or service. The depreciation deduction of the hypothetical new substitute property should be a measure in monetary terms of all of the disadvantages of the existing old property.”

- Market Value
- External obsolescence
- Functional obsolescence
- Physical deterioration

Disadvantages of Existing Property

- Existing fleet age.
- Existing Fleet is less profitable than optimal fleet.
- Existing fleet, after adjusting for optimal fleet profitability, still may not meet industry cost of capital.

✓ These deductions from the Replacement Cost New reveal what a prudent investor would pay for the existing fleet.
Determination of Optimal Fleet Configuration

Compared to the Current Fleet, the Optimal Fleet aircraft have several advantages including:

- Greater fuel efficiency in newer generation of planes
- Lower Maintenance Costs
- Single plane type
- Right-Sized
- The Optimal Fleet and mix of planes is better suited to handle the current passenger trends and maximize the amount of profitability the entire fleet generates
Estimation of External Obsolescence

- Even if an optimal fleet is in place by 2018, SWA may still **not** be meeting its cost of capital
- Would need to develop a forecast that assumes a return on investment in the future
- This return shortfall would be External Obsolescence
Economic Obsolescence

The existence of EO is something that is considered by buyers and sellers of property. EO is inherent in the income and sales comparison approaches but must be considered, analyzed, and deducted in the cost approach.

Cost Approach Equation Summarized

Reproduction Cost New
  Less: Excess Capital Cost
Replacement Cost New
  Less: Physical Deterioration
  Less: Functional Obsolescence
  Less: Economic Obsolescence
Equals Fair Value or Fair Market Value
Methods To Quantify EO

EO can be quantified using several different methods. Each method may or may not be applicable in every valuation problem. Typically, the market and the cause of EO dictate the proper method(s) to quantify it.

Methods include:
- Inutility Analysis
- Gross Margin Analysis
- Sales Comparison - Market Derived Approach
- Income-Derived Approach
- Analysis of Industry Returns (return on capital, return on equity, etc.)
Inutility

Inutility is a cost-to-capacity concept that, when properly identified and measured, can be used to estimate a form of obsolescence within the cost approach.

The basic equation to measure inutility follows:

\[
\text{Inutility (as %)} = \left[ 1 - \left( \frac{\text{Actual Production}}{\text{Design/Rated Capacity}} \right) \times \right] \times 100
\]

Where \( x = \text{Scale Factor} \)

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Inutility – Production Plant

1. Current and expected production levels = 1,500 units/day
2. Design capacity of the production line = 2,250 units/day
3. Appropriate scale factor = 0.7

The resulting inutility percentage is calculated as follows:
Inutility (as %) = \[1 - (1,500 ÷ 2,250)0.7\] × 100

\[
\text{Inutility} = (1 - 0.753) \times 100 \\
\text{Inutility} = 0.247 \times 100 \\
\text{Inutility} = 24.7\%
\]
Inutility – Declining Production

When projections for production are declining, utilization needs to be considered.

1. The approach considers supply vs. demand of future production

2. Translates a decline in utilization into potential profitability loss

3. Similar calculation to that of inutility based on historical production, but introduces the present value of future production
Gross Margin Analysis

The gross margin analysis quantifies EO by comparing gross margins over time.

• Gross Margin = Revenues – Cost of Raw Materials

• Useful method to calculate EO when margins and profitability are the direct cause of value reductions

• Current or future gross margins are compared to a benchmark in time when gross margins were considered to be at “normal” levels
Sales Comparison Approach

The sales comparison (market-derived) approach quantifies EO from sales of similar properties.

• Market comparables of similar properties must be available

• Sufficient information on the sales must be available to verify their similarity with the subject.
Market Derived Approach

Steps include:

1. Deducting land value from the sale price
2. Calculating the replacement cost new ("RCN")
3. Calculating and deducting all forms of depreciation from the RCN, except for EO
4. Subtracting the adjusted sale price (Step 1) from the RCN less depreciation (prior to EO deduction) (Step 3)

The result is EO based on market transactions.
Income-Derived Approach

The income-derived approach quantifies EO by comparing the results of an income approach of a modern replacement plant to the replacement cost new.

**Note:** Because the analysis is based on a modern replacement plant, physical deterioration or functional obsolescence will not exist.
Income-Derived Approach

Steps include:
1. Using a discounted cash flow ("DCF") analysis, determine the income indicator of value for a modern replacement plant.

2. Deduct land value from the income indicator of value of the modern replacement plant.

3. Calculate the RCN.

4. Subtract the adjusted income indicator of value (Step 1) from the RCN. (Step 3)
Return on Total Capital Approach

The return on total capital approach quantifies EO by comparing the earnings to the magnitude of investment used to generate those earnings.

• This approach is a measure of profitability
• It measures the return an investment generates to those who contribute capital (stockholders and bondholders)
• Financial databases (Value Line, Capital IQ, etc.) provide return on capital indicators
• Useful when publicly traded company information is available
Return on Total Capital Approach

Steps include:
1. Determine the historical level of return on total capital of publicly traded companies within the same industry

2. Determine the current level of return on total capital of publicly traded companies within the same industry

3. Conclude a historical level of the return on total capital

4. Conclude a current level of the return on total capital

5. Calculate EO
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Questions and Answers