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ECONOMIC RESEARCH, ANALYSIS & CONSULTING

Overview of Valuation – Theory and Practice

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Valuation theory encompasses a broad theoretical framework to assess the value of assets (including tangible, intangible and financial assets), equity interests, operating segments, and even public or closely-held companies. Valuation requires assimilation of several complex concepts drawn from the fields of economics, finance and accounting. In addition, given the myriad of potential valuation assignments, specific knowledge into the nature of the assets is essential – often including an understanding of engineering (e.g., for structural assets), physics and chemistry (e.g., for pharmaceutical entities), marketing (e.g., for brand names and trademarks), and so on. Indeed, the various needs for valuations include such varied purposes as tax valuation, estate valuation, capital budgeting needs, and mergers and acquisitions, to name just a few.

At the core of every valuation assignment is a precise specification of *value*. Indeed, without defining the standard of value, the results may lack any substantial meaning. Pratt, Reilly and Schweihs correctly note:

> Is the objective of the valuation to estimate fair market value, market value, fair value, true value, investment value, intrinsic value, fundamental value, insurance value, book value, use value, collateral value, ad valorem value, or some other value?
>
> Clients rarely give it much thought. Many don't have enough technical background in business valuation to raise the right questions. One of the professional appraiser's most important tasks is to work carefully and thoroughly with the client and/or attorney to arrive at a definition of value that is appropriate to the specific purpose of the valuation engagement.[1]

The focus of this paper is assessing fair market value by providing readers a general introduction to valuation methodologies designed to measure the fair market value of subject assets, equity interests or businesses. Given the expansive nature of the field of valuation, this article is a primer at best – and only provides general guidance concerning the appropriate approaches towards valuation. We begin by defining fair market value.

Fair Market Value

IRS Revenue Ruling 59-60 provides a clear definition of fair market value:

> [T]he price at which the property would change hands between a willing buyer and a willing seller when the former is not under any compulsion to buy and the latter is not under any compulsion to sell, both parties having reasonable knowledge of relevant facts.[2]

Revenue Ruling 59-60 originally focused on defining fair market value in the context of valuing shares of the capital stock of closely-held corporations for estate tax and gift tax purposes. However, the definition applies to the majority of valuation assignments concerning assets, equity interests, company segments, public corporations, and closely-held corporations.

An important caveat in the assessment of fair market value is the understanding that we assume prevalent economic and market conditions at the date of the particular valuation.[3] The need for a valuation often occurs well after the actual date of the valuation (e.g., a transfer of assets between two entities.) While it is tempting to use hindsight in assessing the value of a particular asset or business, we must recognize that a hypothetical buyer and seller would only be equipped with the information as of the valuation date. Valuation experts that attempt to use available information subsequent to the actual valuation date as a primary foundation for fair market value are violating one of the central tenets of the definition. The use of post-valuation information may provide corroboration of the value conclusion but the usefulness of such information as a primary means to gauge fair market value often results in a biased result.

A case in point involves eBay's acquisition of Skype in October 2005. At the time, eBay paid nearly $2.6 billion for the voice over internet protocol (VoIP) company.[4] Yet, by late September 2007, eBay announced it was taking a $1.43 billion charge related to the acquisition of Skype.[5] In the strictest sense, we should conclude that the fair market value of Skype as of October 2005 was $2.6 billion; despite the fact an *ex post* assessment might conclude this fair market value was grossly overstated.[6]

The eBay acquisition raises an important consideration – how could the eBay valuation of Skype be so horribly off-base? With any valuation assignment, the concept of risk is an essential element. Every asset, equity, or business valuation entails an understanding of the risks associated with the continued future operation of the particular asset, equity interest or business. Different parties are likely to assume different levels of risk in the assurance of future economic benefits related to the valuation entity. As a result, valuation requires a comprehensive risk assessment to ensure that all facts and knowledge are incorporated into the valuation. Perhaps eBay did not fully acknowledge or recognize the risks inherent in the Skype acquisition, leading to an overestimate of the true future economic benefits.

Valuation Methodologies

In the previous section, we touch upon the concept of fair market value, in the context of valuing an asset, equity interest or business as of a specific valuation date. In this section, we delve into the specifics of exactly how we establish a fair market value. Valuation is a forward-looking exercise, which depends on expected future operating conditions. There are three primary types of approaches to valuing assets, firms, or equity ownership percentages. These approaches include the cost approach, the market approach, and the income approach. Each approach has the similar objective of establishing the fair market value of assets or firms, under a willing buyer/willing seller scenario. Indeed, many valuation analysts will employ more than one method to determine value, often corroborating results of one method with another. In addition, there are variations within each primary approach that are often tailored to the specific entity being valued.

Cost Approach

Typically, businesses use cost-based accounting and record the value of assets based on the original cost.[7] One method to value these assets is to estimate the cost to replace the asset, less physical, functional, and economic obsolescence to account for the age of the existing asset. The cost approach involves determining the market value of an entity's assets and subsequently subtracting the fair market value of liabilities to compute a fair market value for the net assets. It is based on the economic principle of substitution, which addresses the cost to replace the existing assets with functional equivalents that offer similar economic benefits to the owner.

As an example, let us assume we are interested in valuing an oil refinery. Under the cost approach, we elect a replacement cost new less depreciation (RCNLD) methodology. We begin by compiling a list of every tangible asset present in our refinery. We subsequently obtain the cost to purchase each tangible asset necessary to construct an identical refinery from the appropriate market. The aggregation of each cost element represents the replacement cost new of the refinery. However, suppose our refinery is twenty years old – how do we account for the potential difference in value? We must account for the physical, functional and economic obsolescence due to the age of the refinery. One method is to compute the depreciation of each cost element using a depreciation index. After accounting for depreciation and obsolescence the residual cost represents the RCNLD and the fair market value of our twenty-year old refinery as of today (our valuation date.)

Another important consideration is that the replacement cost new might not represent the actual cost of our original refinery. Technological advances or differences in asset composition might lead to a new refinery that although similar in function represents a divergence from the asset composition of our existing refinery. In this instance, we might examine the reproduction cost of the original refinery. While we might be able to build a new, comparable refinery using parts available today, we limit ourselves to truly replicating the refinery based on the exact composition of tangible assets.

The reproduction cost might be higher since we end up purchasing twenty bolts, even though a new refinery might only require ten.

Ultimately, the cost approach largely depends on compiling adequate data on the replacement cost for the specific assets being valued, as well as accurate assumptions concerning the physical, functional and technological or economic obsolescence associated with each asset. The cost approach can be used to value specific intangible assets, such as workforce-in-place, but is less suited for valuing other types of intellectual property. Notably, the cost approach is not particularly applicable to valuing whole firms or equity interests.

Market Approach

The market approach involves two primary variations: the comparable transactions approach and the guideline company approach. The comparable transactions approach seeks market information on sales of comparable assets to establish the fair market value of the subject entity or assets. In this approach, the appraiser compiles information on market transactions involving the arm's length sale and purchase of assets comparable in nature to the entity being valued. The appraiser can construct market multiples which express the sales price on a normalized basis, sufficient to apply to the subject entity or assets.

Returning to our example of the oil refinery, the appraiser might examine comparable refinery transactions and create a normalized multiple. For example, suppose four comparable refineries were sold in the previous year, at an average multiple of $300 per barrel of crude oil throughput. If our refinery was a 100,000 barrel refinery, we would compute a comparable transactions fair market value of $30,000,000.[8]

A second market-based approach involves the use of comparable guideline companies. In this approach, the appraiser collects market data on the financial performance of companies who operate in a similar industry, with related functions and risks to the subject assets. Based on the availability of comparable companies and data, the appraiser will compile a series of market multiples applicable to similarly existing financial data for the subject company. The following table provides an overview of the more commonly used market multiples.

Commonly Used Market Multiples in the Comparable Companies Guideline Approach

Multiples	Definition
MVE/Sales	Market Value of Equity to Sales
MVE/EBIT	Market Value of Equity to Earnings before Interest, Taxes
MVE/EBITDA	Market Value of Equity to Earnings before Interest, Taxes, Depreciation and Amortization
MVIC/BVIC	Market Value of Invested Capital to Book Value of Invested Capital
MVIC/Sales	Market Value of Invested Capital to Sales
MVIC/EBIT	Market Value of Invested Capital to Earnings before Interest, Taxes
MVIC/EBITDA	Market Value of Invested Capital to Earnings before Interest, Taxes, Depreciation and Amortization

The market multiples approach is suited for valuing equity interests and business enterprises. Suppose instead of our hypothetical refinery, we are interested in valuing the company that owns the refinery. In this case, we might look to market data on comparable companies operating in the refining segment. We can determine the fair market value using publicly-available market information (e.g., market value of invested capital and sales) of each comparable company, compute relevant market multiples, and apply to the company-specific operating data.

For example, suppose our analysis of comparable refining companies indicates an MVIC/Sales ratio of 2.5 and a MVIC/EBITDA ratio of 8.5. Using normalized historical data for our refinery business, we can estimate the value going forward into the future. If we conclude that the previous five years of average sales and earnings are indicative of future expectations, we might find that our normalized sales and earnings data are:

5-year average sales amount:	$100,000,000
5-year average EBITDA amount:	$20,000,000

The resulting value of the business using our market multiples would be:

Sales multiple value =	2.5 * $100,000,000 = $250,000,000
EBITDA multiple value =	8.5 * $20,000,000 = $170,000,000

We note how the two multiples give different fair market values for the subject business. At this point, the valuation analysis requires further investigation into the underlying data and selection of the most appropriate multiple. For example, a review of the comparable company data might show that in this industry, earnings are a more relevant value indicator than sales. Alternatively, valuation experts will often investigate other methods to help corroborate the value conclusion. Perhaps the comparable transactions approach leads to the conclusion that the fair market value is $180 million, which would corroborate the MVIC/EBITDA multiple (and vice-versa.) Absent other available methods, we might conclude that the true fair market value falls between $170 million and $250 million, with a "point" fair market value of $210 million – which represents the median (and average) of the value results from our multiples analysis.

The viability of the comparable guideline company rests on an analysis of comparability of the functions, risks, and economic performance and expectations between the subject company and the publicly traded comparable companies. The appraiser must be aware of any operational differences, which could bias the results when applied to the subject company.

Income Approach

The income approach employs projections of the future economic benefit of the continued

operation of the subject entity or asset. Pratt, Reilly and Schweihs succinctly capture the nature of the income approach:

> In theory, the value of a business or an interest in a business depends on the future benefits that will accrue to that business, with the value of those future benefits being discounted back to a present value at some appropriate discount rate. In other words, the basic concept of the income approach is to project the future economic income associated with the investment and to discount this projected economic income stream to a present value at a discount rate appropriate for the expected risk of the prospective income stream.[9]

The income approach includes variations based on the availability of projections of economic income, the definition of economic income, and determination of discount rate. However, the valuation theory of each method depends on the same underlying framework of the basic discounted economic income approach.

In this approach, the appraiser will define the economic income, usually as dividends, net cash flow to equity, net cash flow to invested capital, or net income (after taxes.) Future periods of expected economic income are estimated and subsequently discounted to present value using an appropriate discount rate. A common hurdle in the basic discounted economic income approach is the availability of a reliable set of future projected cash flows or earnings, sufficient to forecast future periods of economic income. Assuming we are using cash flows, we can express the discounted cash flow (DCF) equation as:

$$FMV = PV = \sum_{i=1}^{n} \frac{CF_i}{(1+k)^i}$$

Where CF_i are the periodic cash flows (for each period i through n) and k is the discount rate (the cost of capital, e.g., the expected rate of return available in the market for other investments of comparable risk and characteristics.) The DCF methodology requires an assumption about the future cash flows and the appropriate discount rate. The discount rate incorporates the risk of realizing the future cash flow streams.

One approach, which is a variation of the basic discounted economic income approach, is the capitalized future economic income method, sometimes referred to as the capitalization of earnings method. In this method, future sustainable economic income contains only an estimate of a single year's income expectancy. Mathematically, the capitalized value is defined by the following equation:

$$PV = \frac{E_0(1+g)}{(k-g)}$$

where *PV* is the determined value, E_0 represents the average economic income in the current period, *g* is the long-term growth rate associated with the economic income, and *k* is the appropriate discount rate. As the equation illustrates, there are three components to measuring the fair market value, including the appropriate determination of economic income, long-term expected growth rate, and discount rate. Typically, a historical five-year average economic income value is computed, and subsequently capitalized to determine a value. The value depends on the selection of an appropriate capitalization rate, which should include an assessment of the various risks associated with the uncertainty of achieving future expectations. The previous equation also relies on the assumption of constant growth into the future. Different growth rate assumptions in the future may require the modification of this one-stage model to incorporate periods of high- or low-growth, as well as terminal growth assumptions.

There are two essential concerns when defining the numerator (economic income) and denominator (discount rate). A central tenet of the capitalization of earnings approach includes correct definition of the earnings variable, consistent with the definition of the other variables used in the value determination. Several variations of the income approach exist depending on the definition of economic income measured. Possible definitions include:

- Dividends (or other payouts to security holders, such as partnership withdrawals);
- Net cash flow to equity, which equals net income after taxes plus noncash charges (e.g., depreciation amortization, deferred taxes), less capital expenditures and changes in working capital, plus changes in long-term debt;
- Net cash flow to overall invested capital, which equals net income plus noncash charges, less capital expenditures and working capital, plus interest expense (net of any tax effect), plus preferred dividends (if any); or
- Net income (after taxes).[10]

It is essential that the appropriate definition of economic income used in the capitalization of earnings approach is consistent with the selection of a long-term growth rate and discount rate. A common valuation mistake is to employ one measure of economic income but use a capitalization rate which is applicable to a different measure of economic income.

Continuing with our refining business example, let's suppose we lack future cash flow or earnings data. However, we have historical data and believe that future cash flows will grow at a rate of 3 percent. Based on a detailed functional and financial risk analysis, we conclude that the appropriate discount rate, specific to our definition of economic income, is 12 percent. Finally, our historical data indicates that initial earnings amount is $18,000,000. Based on the capitalization of earnings approach, our capitalization rate is 9 percent and we can compute the fair market value:

$$FMV = \frac{\$18,000,000(1+.03)}{(.12-.03)} = \$206,000,000$$

The capitalization of earnings approach yields a fair market value of $206 million. Following sound valuation practice, we might corroborate our capitalization of earnings approach by looking at a market multiples approach or alternative valuation method. In addition, we ensure that our numerator and denominator are consistent, where the capitalization rate matches our definition of economic income.

Summary

This article presents a very broad and general introduction to valuation. We focus on defining value, particularly fair market value, and introduce the three generally acceptable approaches to valuation (cost, market, and income.) However, variations on each method are prevalent in real-world applications and every valuation project is unique – this requires the valuation expert to go beyond the simple methodologies outlined in this article to fully assess all available qualitative and quantitative data which might influence the fair market value of assets, equity interests or businesses.

Endnotes

1 Shannon Pratt et al., *Valuing a Business – The Analysis and Appraisal of Closely Held Companies*, Fifth Edition, McGraw-Hill, New York, 2008, p.41.

2 RR 59-60 Section 2.02

3 Pratt, p. 42.

4 For this example, we ignore potential incentive payments that would increase the value of Skype.

5 EBay revises its ambitions for Skype, Brad Stone, NYT, October 2, 2007. http://www.nytimes.com/2007/10/02/technology/02ebay.html

6 The very nature of the acquisition establishes the fair market value. In this case we had a willing buyer and willing seller that settled on the acquisition price in the open market.

7 We must impress upon readers that rarely, if ever, does book value equal fair market value. However, given data limitations, there are times when appraisers and valuation experts will employ book value as a suitable proxy for fair market value.

8 In fact, refinery valuations often rely on the comparable transactions approach. However, the normalized multiple is more complex than our simple hypothetical.

9 Pratt, p. 175.

10 Pratt, p. 180-181.