VALUATION TECHNIQUES USED IN FAIR VALUE MEASUREMENT

Cristina-Aurora, Bunea-Bontaș¹

Abstract:

Valuation of assets and liabilities involves significant judgements and estimates, especially when fair value measurement is required. Currently, IFRS 13 Fair Value Measurement offers a single and more comprehensive source of guidance that is applied to almost all fair value estimates.

When measuring fair value of fixed assets, intangible assets, specified financial assets or liabilities, different valuation techniques may be used: the market approach, the cost approach and the income approach. This article reviews these techniques and points out that different valuation practices may provide different results depending on the item being fair valued and on the inputs used. Also it emphasizes that, in particular circumstances, there is the possibility that a certain technique may be more appropriate than other.

Key words: fair value, valuation technique, market approach, cost approach, income approach

JEL classification: M41

1. Introduction

Fair value measurement is an important area of accounting and the global financial crisis emphasised the need for clarifying how to measure fair value and also highlighted the need for improving the transparency of fair value measurements through disclosures about measurement uncertainty. International Accounting Standards Board (IASB) added the project of fair value measurement to its agenda on September 2005, as a part of its joint efforts with the Financial Accounting Standards Board (FASB), the US national standard-setter, to create a common set of high quality global accounting standards.

The goals of the fair value measurement project were:

- to reduce complexity and improve consistency in the application of fair value measurement principles by having a single set of requirements for all fair value measurements;
- to communicate the measurement objective more clearly by clarifying the definition of fair value;
 - to improve transparency by enhancing disclosures about fair value measurements; and
- to increase the convergence of IFRSs and US GAAP (IASB, 2011, pp. 4; PKF International, 2012, pp.1).

Committed to achieving these goals, IASB issued IFRS 13 Fair Value Measurement in May 2011 (applied for annual periods beginning after 1 January 2013), establishing a single source of guidance for all fair value measurements used for financial reporting. As it is noted in the Introduction of IFRS 13, this Standard defines fair value, sets out in a single IFRS a framework for measuring fair value, and requires disclosures about fair value measurements. It does not introduce any new requirements to measure an asset or a liability at fair value and it does not change what is measured at fair value in IFRSs.

As we have pointed out in the prior paragraph, one of the main features that the Standard addresses is the definition of the fair value. Fair value was previously defined by IAS 39 *Financial Instruments: Recognition and Measurement*, being "the amount for which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties in an arm's length transaction" [IAS 39.9]. IFRS 13 has changed the definition, this being based now on the 'exit-price' notion.

¹ Lecturer PhD., Constantin Brancoveanu University of Ptesti, Faculty of Management Marketing in Economic Affairs of Braila, bontasc@yahoo.com

The Standard defines fair value as: "The price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date" [IFRS 13.9]. We point out that this definition focuses on the price that would be received to sell the asset or paid to transfer the liability (that is the 'exit price'), not on the price that would be paid to acquire the asset or received to assume the liability (that is the 'entry price'). The definition is moving towards an exit value-based approach, emphasising on market participants and excluding factors that are specific to the entity (Watchman, 2011, pp. 2).

This change is important from the perspective of incorporation of credit risk (Blaik and Jacqui, 2012, pp. 3). The credit risk takes into consideration the following three types of risk: default risk, exposure risk and recovery risk (Vechiu, Tudose and Chifane, 2011, pp. 2279). The default risk resides in the probability of non-payment of an outstanding debt and the exposure risk quantifies the degree of uncertainty regarding the borrowed amounts. The recovery risk depends on the type of non-payment and other factors (e.g., the debtor's guarantees and the type of these guarantees). Hence, the valuation technique used to estimate fair values need to be reviewed, in order to include the appropriate risk adjustments that take into account all the components of the credit risk and, additionally, the liquidity risk. According to Yong, a fair value estimate that does not take into account all factors that market participants would consider in pricing the asset or liability does not represent a fair estimate of a current transaction price on the measurement date (Yong, pp. 4).

2. Valuation Techniques

According to IFRS 13, the *objective* of using a valuation technique is to estimate the price at which an orderly transaction to sell the asset or to transfer the liability would take place between market participants at the measurement date under current market conditions [IFRS 13.62]. Some *general principles* need to be applied when selecting the appropriate valuation technique. The valuation technique should be:

- appropriate, depending on the circumstances;
- a technique for which sufficient data is available;
- maximise the use of relevant observable inputs and minimise the use of unobservable inputs;
 - consistent with the objective of using a valuation technique, according to the Standard.

A valuation technique has the following principal *characteristics*:

- it is commonly used by market participants and uses inputs that market participants would usually consider;
 - it is consistent with accepted economic methodologies and techniques;
 - it relies as little as possible on entity-specific factors;
 - it is applied consistently; and
 - it has to be validated against actual market transactions (KPMG, 2012, pp. 14-15).

The Standard notes that there are three widely used valuation techniques: the market approach, the cost approach and the income approach (table no. 1). These techniques are consistent with the going-concern assumption and they may be used for fair value measurement of entities or specialized assets and liabilities.

Table no. 1. Valuation techniques used in fair value measurement

The market approach	Is based on market transactions involving identical or similar assets or liabilities
The cost approach	Is based on the amount required to replace the service capacity of an asset (frequently referred to as current replacement cost)
The income approach	Is based on future amounts that are converted (discounted) to a single present amount

Source: IFRS 13 par. B5, B8, B10-11

2.1. Market approach

IFRS 13 defines the market approach as "a valuation technique that uses prices and other relevant information generated by market transactions involving identical or comparable (i.e. similar) assets, liabilities, or a group of assets and liabilities, such as a business" [IFRS 13.B5]. Under the market approach, the value is determined based on comparable transactions.

The valuation techniques based on market approach are: (a) valuation techniques using market multiples derived from a set of comparables [IFRS 13.B6]; and (b) matrix pricing [IFRS 13.B7].

(a) *Market multiples*. A market multiple expresses the value of a business or other asset in terms of its ratio to a financial, operating or physical metric. Multiples might be in ranges with a different multiple for each comparable asset or liability. When multiples are derived from a number of comparable entities, there will typically be a range of multiples calculated and the selection within the range should be based on markets' expectations (KPMG, 2011, pp. 23). The selection of the appropriate multiple within the range requires judgement, considering qualitative and quantitative factors specific to the measurement (Ernst & Young, 2012, pp. 108).

In the educational material on fair value measurement issued in December 2012 (updated in February 2013), IASB provides specific guidance for using valuation techniques within the market approach (IFRS Foundation, 2012, par. 42, pp. 18). Valuation multiples can be calculated either for the equity holders (i.e. equity value) or for both debt and equity holders (i.e. enterprise value). The numerator in calculating a valuation multiple is either equity value or enterprise value (EV), and the denominator is a performance measure that has to be consistent with the valuation bases in the numerator.

For example, Earnings before interest and taxes (EBIT), Earnings before interest, taxes and amortisation (EBITA), Earnings before interest, taxes, depreciation and amortisation (EBITDA) and revenue performance measures provide returns to all capital providers, whether debt or equity holders. Consequently, investors would apply enterprise value to such measures, because enterprise value reflects the value to all capital providers. Similarly, a net income (profit or loss) performance measure is a measure of earnings (E) after providing the return to debt capital providers (i.e. interest payments). Therefore, it is a measure of earnings available to equity capital providers and, for this reason, investors would apply the equity value (i.e. an entity's market capitalisation, based on its quoted share price (P)) to the net income measure in a price/earnings (P/E) multiple. The same logic applies to price/book value (P/B) multiples, in which book value (B) represents the book value of an entity's shareholders' equity. Table no. 2 summarizes the advantages and disadvantages of different market multiples.

The results of estimating the fair value using the market approach may be affected by common errors, inappropriate selection of companies or inappropriate adjustments, relying on third-party data without validating, or mismatch of multiples and financial data.

(b) *Matrix pricing*. This is a mathematical technique used principally to value some types of financial instruments, such as debt securities, without relying exclusively on quoted prices for the specific securities, but rather relying on the securities' relationship to other benchmark quoted securities. The method derives an estimated price of an instrument using transaction prices and other relevant market information for benchmark instruments with similar features (e.g., coupon, maturity or credit rating) (Ernst & Young, 2012, pp. 115).

Table no. 2. Advantages and disadvantages of different market multiples

Multiple	Resulting Value	Advantages	Disadvantages
EV / EBIT	Enterprise Value	Ignores capital structure and tax	Asset base differences can
		situation	distort results
EV / EBITDA	Enterprise Value	Ignores capital structure and tax	
		situation; considers asset base	
		differences	
EV / Revenue	Enterprise Value	Easily calculated	Ignores operating differences
P/B	Equity Value	Most useful with financial	Unreliable in many industries
		institutions or 'spread'	due to different accounting
		businesses	practices
P/E	Equity Value	Common usage; easily	Influenced by capital structure
		computed	and different accounting
			practices

Source: Adapted from Deloitte (2013b), "IFRS 13 and Valuation Techniques", 27 May, pp. 24, available at: http://www.icapksachapter.org/wp-content/uploads/presentation/IFRSPPT 2013.pdf

2.2. Cost Approach

IFRS 13 defines the cost approach as "a valuation technique that reflects the amount that would be required currently to replace the service capacity of an asset (often referred to as current replacement cost)" [IFRS 13.B9]. Based on the cost approach, the fair value is the cost to acquire or construct a substitute asset of comparable utility, adjusted for obsolescence, including physical deterioration, functional (technological) obsolescence and economic (external) obsolescence (PricewaterhouseCoopers, 2011, pp. 15).

The cost approach estimates fair value using the economic principle that a buyer will pay for an asset no more than the cost to obtain an asset of equal utility. It is based on the principle of substitution, i.e. unless undue time, inconvenience, risk or other factors are involved, the price that a buyer in the market would pay for the asset being valued would not be more than the cost to assemble or construct an equivalent asset (AASB, 2011, pp. 8).

When the cost approach is applied some important issues need to be taken into consideration: availability of comprehensive cost data; replication to current depreciated state; functional and economic obsolescence; inflation; and loss of profits during reproduction.

An example of valuation technique based on the cost approach is the Depreciated Replacement Cost (DRC) method. In assessing what it might be prepared to pay for the subject asset, a potential purchaser may consider as an alternative to acquire that asset, the cost to construct a similar asset having the same functionality. This represents the maximum that a potential purchaser would be prepared to pay for the subject asset if it were new at the date of valuation (AASB, 2011, pp. 8). Sometimes, the asset being valued may be less attractive than the alternative that could be purchased, because of age or obsolescence. In this case, adjustments for depreciation need to be made to the cost of the alternative asset.

Example: Entity X has a purpose-built industrial property with an estimated life of 50 years with 15 years remaining. The property has a floor area of 3000 mp and a site area of 2 ha. The fair value of this property needs to be estimated using the DRC method.

The market value of the site area is estimated at CU50,000 per ha, by referring to evidence of comparable transactions on the land market. Construction costs are estimated at CU400/mp, on a basis of a modern equivalent building instead of an identical replacement, because it would be more cost-effective. Estimates of the construction costs were obtained from a professional cost estimator. The land and the building are fair valued at the same time.

The building cost has to be adjusted with an allowance due to age and obsolescence. This allowance is calculated on a straight line percentage deduction based on the proportion of estimated remaining economic life.

DRC method for estimating the fair value of the property is applied as follows:

• Land: $2 \text{ ha} \times \text{CU}50,000 \text{ per ha}$ CU100,000

• Building: modern replacement cost CU400/mp CU1,200,000 depreciation 35/50 years = 70% CU -840,000

CU360,000

Estimated DRC = $\overline{\text{CU460,000}}$

2.3. Income approach

IFRS 13 defines the income approach as "the valuation techniques that convert future amounts (e.g. cash flows or income and expenses) to a single current (i.e. discounted) amount. The fair value measurement is determined on the basis of the value indicated by current market expectations about those future amounts" [IFRS 13.B10].

The valuation techniques related to income approach are based on estimated future income and profits or cash flows. The Standard provides examples of valuation methods that are consistent with the income approach: (a) present value techniques; (b) option pricing models; and (c) the multi-period excess earnings method [IFRS 13.B11]. Most commonly used are: the income capitalisation method and the discounted cash flow method.

Under the income capitalisation method, an income stream that is likely to remain constant is capitalised using a single multiplier. This method has the advantage that it is quick and simple, but cannot be reliably used in case that the income is expected to change in future periods to an extent greater than that generally expected in the market or when a more sophisticated analysis of risk is required.

The discounted cash flow method has various forms that can be used in practice. The basic characteristic is that the net income for a defined future period is adjusted to a present day value using a discount rate (Ernst & Young, 2013, pp. 9).

The inputs into a valuation technique are determined based on the following general principles:

- the assumptions used for the cash flows and discount rates should reflect market participants' views;
- the assumptions should consider only the factors attributable to the asset or the liability being fair valued:
- discount rates should reflect assumptions that are consistent with those inherent in the cash flows to avoid double counting or omitting the effects of certain risk factors; and
- assumptions about cash flows and discount rates should be internally consistent. For example, if the cash flows include the effect of expected inflation, then the discount rate also includes the effects of inflation (KPMG, 2011, pp. 24).

Some IFRSs that deal with discount rates, such as IAS 36 *Impairment of assets*, refer to an entity's weighted average cost of capital (WACC) as the starting point in determining a possible appropriate discount rate [IAS 36.A17].

Example: Entity X has a one-year interest-bearing debt of CU10,000 at the valuation date. The interest rate of the debt is 6 percent and the market yield to maturity is 5 percent. The general approach for estimating the fair value of the short-term debt is to discount to present value, at the market rate of return, the actual or interest-based cash flow, consisting of principal and interest:

1.	Principal	CU10,000
2.	Interest rate	6%
3.	Market yield to maturity	5%
4.	Interest payment (1×2)	CU600
5.	Principal payment	CU10,000
6.	Debt service (4+5)	CU10,600
7.	Present value discount rate	0.95238
8.	Fair value (6×7)	CU10,095

It should be noted that, at the valuation date, the fair value of the short-term debt is CU10,095 that is the cash flow for a defined future period adjusted to the present day value using the discount rate.

3. Selecting the appropriate valuation techniques

IFRS 13 Fair Value Measurement requires that an entity use valuation techniques that are consistent with one or more of the above valuation approaches. Not all of the approaches are applicable to all types of assets or liabilities. When measuring the fair value of an asset or liability, IFRS 13 requires the entity to use valuation techniques that are appropriate in the circumstances and for which sufficient data is available. As a result, the use of multiple valuation techniques may be required more frequently than in current practice.

The determination of the appropriate technique or techniques to be applied requires significant judgement, sufficient knowledge of the asset or liability and an adequate level of expertise regarding the valuation techniques.

Example 1 (adapted from Deloitte, 2013a, pp. 74-75): Entity A has a 5% equity interest in Entity B, whose shares are not traded in an active market. Entity B is considered comparable to a number of entities whose shares are traded in an active market. For estimating the fair value of the equity interest in Entity B, Entity A should use a valuation technique based on market approach or income approach, depending on the specific facts and circumstances. These techniques are common in estimating the fair values of investments in equity securities that are not publicly traded. Cost approach is generally not appropriate in estimating the fair value of investments in equity securities.

In case that no significant adjustments are required, Entity A should use the market approach. In case that direct comparables entities are not available, income approach would be more appropriate.

Example 2: Entity A acquires Entity B, whose trade name represents substantial value in business transaction, being recognized as a marketing-related intangible asset. All products and services of entity B are sold under this trade name. Upon acquiring the Entity B's assets, Entity A gained and paid for the right to use this trade name.

There is no principal market for this asset. The most advantageous market consists of the potential buyers of the acquiree, as the asset has no market on a stand-alone basis. The highest and best use of the trade name is in-use. However, there are observable inputs on comparable trade names.

In order to estimate the fair value of the trade name, the most appropriate valuation technique has to be determined. Under the cost approach, all the cost related to recreate the trade name has to be identified, operation that may be difficult to put into practice.

Considering the market approach valuation, trade names are rarely sold separately in the marketplace; thus, information required to perform this valuation method is rarely available. The conclusion is that the most appropriate valuation technique should be based on the income approach, i.e. the relief-from-royalty method. This is a commonly used method for intangible assets that could be licensed. Fair value is the present value of licence fees avoided by owning an asset. The premises of this valuation methodology is the assumption that Entity A would be compelled to pay the rightful owner of the trade name if the owner did not have the legal right to utilize the subject intellectual property (Hitchner, 2011, pp. 939-940). The two types of inputs are the royalty rate and the revenue forecast. Regarding the royalty rates, there are several data sources concerning various royalty rates used for valuation of intellectual property (e.g. Intellectual Property Research Associates Database, Royalty Source Intellectual Property Database).

The characteristics of the asset or liability being measured and the availability of observable market prices may contribute to the number of valuation techniques used in a

fair value analysis. For example, the fair value of a business is often estimated by giving consideration to multiple valuation approaches; such as an income approach that derives value from the present value of the expected future cash flows specific to the business and a market approach that derives value from market data based on observed transactions for comparable assets (Ernst & Young, 2012, pp. 108-109).

4. Conclusions

IFRS 13 Fair Value Measurement details the framework for measuring fair value for entities reporting their financial statements based on IFRSs. Currently, the Standard provides a consistent definition of fair value, outlines several types of valuation techniques that can be used to measure fair value, and requires entities to disclose their valuation inputs, in order to increase consistency and comparability in fair value measurements.

Valuation involves significant judgement and it is based on several valuation techniques. Different valuation techniques may provide different results, because of the inputs used and the adjustments to those inputs. The existence of the different results is not due to the fact that any of these techniques is incorrect. This means that one valuation technique may be more appropriate than others, in specific circumstances.

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