

Teaching Fair Value Measurement
CPE #44
Anaheim, CA
August 3, 2008

I. Introduction to Teaching Fair Value Measurement

The introduction has the following objectives:

- Develop case for integrating fair value measurement throughout the accounting curriculum
- Introduce SFAS No. 157: definition, treatment of transaction costs, application of fair value hierarchy, valuation techniques, disclosure
- Discuss what entry-level accountants should know about fair value
- Consider background students have for learning about fair value measurement
- Preview rest of the session

II. Fair Value of Financial Assets and Liabilities

The second part of the class has the following objectives:

- Estimate fair value for a large block holding of a traded equity security when the market for that security is somewhat thin and there are no trades on the last days of the accounting period. Issues include determining the unit of account and determining the appropriate fair value among the last traded price and the closing bid and ask prices.
- Estimate fair value for a loan receivable (asset) when the terms of the loan are consistent with market conditions at the time of issue and there have been no material changes in those conditions. Issues include determining the observable market inputs, determining the “level” of the financial asset, and computing the appropriate fair value for the loan (which in this case is amortized cost).
- Estimate fair value for a loan receivable (asset) when the terms of the loan were consistent with market conditions at the time of issue, but the credit standing of the borrower has deteriorated since that time. Issues include determining the observable market inputs, determining the “level” of the financial asset, and computing the fair value for the loan (which in this case is not amortized cost). Computations illustrate the differences among contracted future cash flows, expected future cash flows, and certainty equivalent future cash flows, and the appropriate discount rate to use for each.

- Estimate fair value for a loan payable (liability) when the terms of the loan were consistent with market conditions at the time of issue, but the credit standing of the borrower has deteriorated since that time. Issues include determining the observable market inputs, determining the “level” of the financial liability, and computing the fair value for the loan. Differs from the previous example in that the managers have a different perspective because these managers are faced with the opportunity to record a gain from their deteriorating credit standing.

III. Sprint Nextel—Valuing Firm Equity **Background Reading**

The main objectives of this part of the CPE session (and of the Sprint Nextel case materials) are to help participants (and their students):

- Learn to apply income-based valuation method.
- Develop a parsimonious multi-period forecast of operating profit and assets.
- Understand the concept of residual income and how it relates to fair value.
- Apply the residual income model to estimate fair value of a firm.
- Understand how SFAS 157 Level 2 and Level 3 inputs affect estimated fair values.

The fair value of many companies’ equity is easily determined by observing its traded stock price – a Level 1 input (observable quoted prices) in the SFAS 157 valuation hierarchy. However, there are situations when the observed fair value is not appropriate for financial reporting or decision making. For example, if the firm’s stock is thinly traded or the shares held are restricted under SEC Rule 144, the quoted market price may not accurately reflect fair value. Other times, Level 1 inputs are not available; for instance, when the firm is undergoing an IPO or the firm is private. When Level 1 inputs are either inappropriate or unavailable, we must rely on Level 2 inputs (observable model inputs) and Level 3 inputs (unobservable model inputs) to estimate valuation models to determine equity fair values.

One commonly used equity-valuation model is the residual operating income (ROPI) model. The ROPI model is very powerful in that it uses accounting information

to capture key economic variables in an intuitive fashion. The ROPI model is algebraically equivalent to valuing a company by determining the present value of its future dividends. However, the model uses accrual accounting numbers instead of dividends. The ROPI model demonstrates that a firm's equity value depends on the present value of its future *residual operating income*.

Residual operating income (ROPI) is an economic concept. It represents the profits a company earns above and beyond what we would expect given the company's assets. A normal return on the company's assets is the expected, or hurdle amount; anything above the hurdle, is "residual." How can profits exceed the hurdle amount? One answer is that the company's managers are able to generate additional value for the firm by their exceptional skills and by their superior management of the company's assets. Another answer is that the GAAP balance sheet does not capture all of the firm's economic assets. For example, a well-known brand name may generate additional sales (and operating profits) for the firm but because the brand name was not purchased, it is not on the company's balance sheet. Thus, expected profits calculated with the balance sheet assets will set a hurdle that is low and the company will earn residual income. Were the brand name actually recorded on the balance sheet, the company would have lower residual operating income.

To calculate ROPI, we compare actual and expected operating income (after tax). Each period, the firm's expected operating income is equal to the value of beginning of the period net operating assets times the firm's weighted average cost of capital. If a firm's net operating income is exactly equal to the expected income, then the firm has earned no residual operating income. When net operating profits are greater than (less

than) the hurdle amount, the firm has positive (negative) residual operating income.

Algebraically residual operating income is:

$$ROPI_t = NOPAT_t - (NOA_{t-1} \times r)$$

Where:

- $ROPI_t$ is residual operating income for period t .
- $NOPAT_t$ is net operating profit after tax in period t .
- NOA_t is the value of net operating assets of the firm at time t . Note that the subscript on NOA is lagged by one period (i.e., $t-1$) because we use the net operating assets at the beginning of the period to calculate the expected, or hurdle, operating profit for the period.
- r is the firm's weighted average cost of capital and uses SFAS 157 Level 2 inputs.

To estimate the ROPI model we must forecast the firm's operating results for the rest of its corporate life. These model inputs are SFAS 157 Level 3 inputs. Typically, we forecast near term and long-term performance separately. We might forecast operating income and operating asset levels for the next few years (say, three or four) based on the company's current profitability and expected short-term growth. This period is known as the forecast horizon. The period beyond the forecast horizon is called the terminal period and here we would need to estimate long-run growth rates. In general, firms' long-run growth rates are pretty close to the growth for the economy as a whole because long-run profits are more affected by competitive forces and macroeconomic factors than by the firm's managers. Thus, the value of the firm depends on the operating performance during the forecast horizon and the terminal period. Algebraically, the residual operating income model is:

$$V_0 = NOA_0 + \frac{ROPI_1}{(1+r)^1} + \frac{ROPI_2}{(1+r)^2} + \frac{ROPI_3}{(1+r)^3} + \frac{ROPI_4}{(1+r)^4} + \frac{ROPI_5}{(r-g)(1+r)^4} - Debt_0$$

Where:

- V_0 is the estimated fair value to the firm's equity holders at time 0.

- r is the firm's weighted average cost of capital, which also serves as the discount rate to calculate present values of future amounts.
- g is the appropriate long-run growth rate for residual operating income.
- $Debt_t$ is the value of the firm's debt at time t , net of any nonoperating assets such as marketable securities.

The first term on the right hand side of the model, NOA_0 , is the value of the firms' net operating assets at the date of the valuation. Net operating assets include all the company's assets used to generate ordinary operating income *less* all of the company's operating liabilities. Managers don't generate additional value for shareholders by investing excess cash in nonoperating assets like marketable securities. Operating liabilities include accounts payable and other obligations that the company incurs in the ordinary course of business. Importantly, net operating assets exclude short-term and long-term debt and capitalized leases. Thus, net operating assets do not take into account the firm's financing choices.

The next four terms in the ROPI model represent the additional value that managers are expected to create over the forecast period (that is, the additional operating profits generated from "missing" assets). The numerator in each term is the residual operating income generated each period. Each period's residual operating income is discounted to arrive at the present value of the future ROPI amounts.

The penultimate term in the model is the terminal value and it has three parts. The numerator is the amount of residual operating income expected to be generated in period 5 and each period thereafter for the entire life of the firm. Thus, the numerator is an annuity. The first term in the denominator reflects the assumption that residual operating income will continue to grow at a constant rate, g . Dividing by $(r - g)$ yields the present value of an annuity received in perpetuity. The second term in the denominator calculates

the present value of the ROPI annuity at the beginning of period 5 (end of period 4); ROPI₅ needs to be discounted back to time 0 by the present value factor for four periods (i.e., $(1 + r_e)^4$).

The last term in the model represents the firm's debt at the valuation date (that is, the nonoperating liabilities). This is the portion of the enterprise value financed by non-owners and is net of any nonoperating assets such as marketable securities or other investments that do not contribute directly to the company's ongoing operating profits.

IV. Fair Value and Impairment

This case allows students to explore various issues associated with asset valuation, impairment analysis, and fair value disclosure. The case is structured in a semi-modular format (as discussed below) so that an instructor can cover selected portions of the case or the whole thing.

There are 6 questions that accompany the case. These questions address the following general areas.

- Impairment analysis and asset valuation (Questions 1 and 2)
- Fair value disclosures (Question 3)

Instructors should not feel a need to include or cover all of the questions. Depending on the course and on the desired emphasis, a subset of the questions can be given to the students. Examples of how the case can be used are given below.

- Intermediate financial accounting I – Questions 1 and 2 are especially appropriate for an intermediate financial accounting I course. These questions address issues of asset valuation and impairment. Question 1 is a fairly straightforward PPE impairment question; this can be used on a standalone basis. Question 2 seems deceptively straightforward. However, in order to do the goodwill impairment analysis, a series of intangible asset valuations also need to be done. Question 2 could be a great capstone question in covering tangible asset, intangible asset, and goodwill impairment.
- Financial statement analysis (lots of structure) – In a financial statement analysis course where it is desired to provide the students with lots of structure, the case can be assigned with all of the questions. Students can then prepare for the discussion in a systematic way, very much like a large homework assignment. Classroom discussion of the asset valuation questions should illustrate the solution embodying the assigned parameters and then show sensitivity analysis.

- Financial statement analysis (little structure) – In a financial statement analysis course where it is desired to have the students wrestle with an unstructured setting, the instructor can give the students just one question – Question 2 which asks students to compute the amount of goodwill impairment. Students must work

V. Auditing Fair Value

Introduction and Purpose

As part of the audit engagement team's review of MMN Builders, Inc.'s financial statements you have been asked to review the valuation analysis performed by Appraisal Professionals, LLC for purposes of goodwill impairment testing under SFAS 142. The valuation analysis has been organized as follows with each section requiring individual attention and review:

Subject	Report Section	Exhibit Number
Company and Testing Background	Section 1	
Industry Overview	Section 2	
Engagement Overview	Section 3	
Impairment Executive Summary	Section 4	Exhibits I and II
SFAS 142 Step 1 <ul style="list-style-type: none"> ▪ Discounted Cash Flow ▪ Publicly Traded Company Multiples 	Section 5	Exhibits III-VIII
SFAS 142 Step 2 for the Northeast Reporting Unit	Section 6	Exhibits IX-XIV
Assumptions and Limiting Conditions	Appendix 1	
Accounting Guidance	Appendix 2	
Valuation Methodology	Appendix 3	
Certifications and Qualifications	Appendix 4	

The following review program is intended to assist auditing professionals in reviewing goodwill impairment testing and measurement analyses performed in accordance with SFAS 142. It provides a structured approach and contains suggested technical references. This review program is divided into sections which roughly correspond to those listed in the report structure table above. This program organization is meant to facilitate a structured review of each section of the valuation analysis. These sections can be reviewed all at once or in a piecemeal fashion.

The attached program contains a list of questions and comments designed to guide your review. Effort should be made to answer each question in as much detail as possible, noting all means expended to gain comfort with each aspect of the valuation analysis.

Simple "Yes" or "No" answers should be avoided when possible. In the event that the information provided within the subject valuation report and calculation schedules is not sufficient to answer a given question within this program, such deficiencies should be noted along with suggested steps to be undertaken to ensure a resolution of the issue. In making such a suggestion, students should consider the materiality of the issue and its importance to the overall impairment testing and measurement exercise. Materiality may be assessed through the use of sensitivity analyses. For example, if an assumption lacks support, an analysis of how different the impairment conclusion would be if that assumption were changed upward or downward could be performed. The methodologies used and conclusions reached through such an analysis should be noted within this program.

Through deliberation of the considerations noted within this review program students should reach an assessment of the 5-8 key value-driving issues for which further clarification, analysis, and diligence is required in order to assess the reasonableness of the impairment conclusions reached. These key issues should be those which will have the largest impact on the impairment conclusion. Students should prepare a presentation including the following items to be discussed for each of the key issues identified:

1. Identification and explanation of the key issue;
2. An explanation of how this matter was determined to be critical to the impairment calculation;
3. A summary of any sensitivity analyses which have been performed to determine the effects of changes to the approach taken by the appraiser to address the subject issue;
4. Suggested methods of verifying the accuracy or inaccuracy of the appraiser's approach or conclusions reached as related to the issue; and
5. Next steps required to further address the issue and reach an ultimate conclusion.