

THE ACCOUNTING VALUE AND THE MARKET VALUE OF EQUITY – THE FELTHAM-OHLSON MODEL

Roxana-Manuela DICU¹

¹ „Alexandru Ioan-Cuza” University, Iasi
e-mail: rm.dicu@yahoo.com

The markets have become global and the various financial centers and major banks start permanently in a competitive process without precedent. These developments have led to the emergence and expansion of financial assets, whose use requires additional competence and guidance. Their use can not be conceived without a real support in assessment, to provide their fair value as determined by the most appropriate method, with information from specialized markets. Financial valuation model of Feltham-Ohlson is considered a tool to study financial markets, used by practitioners for the analysis and the ability to guide accounting and financial options or the ones related to managerial decisions. The model has essentially an accounting content, based on anticipation of future dividends. Feltham and Ohlson propose an innovative approach of the valuation of the enterprise by linking market value of equity to its accounting value, which is added to an updated value of future "abnormal" earnings. Linear information model (LIM) represents the estimated part of the value of the enterprise, taking into consideration the precautionary principle attached to the value of accounting results. Relevancy of the company's financial position is judged by the strength of financial assets and the operating assets to generate future cash-flows. Operating assets are able to emit a return higher than originally anticipated and that is what the authors qualify as a residual result.

Key words: equity, market value, financial position, dividends.

The work of Ohlson (1995) and Feltham-Ohlson (1995) was met with enthusiasm in the accounting and capital markets research. Theorists have praised the elegance and simplicity of the valuation framework provided by the Feltham-Ohlson model which we refer to, but most of all, they have welcomed the attempts of these studies to link closely accounting and more specific financial reporting data to economic performance and, consequently, firm value.

The basic principle of the FOM is to allow a methodical restructuring of equity, from their accounting value to the market value, from an applicative point of view. Thus, the first aspect is the essential features of the model and the second one relates to issues of general evaluation [2].

The study focuses theoretically on the impact of deviations from the clean-surplus principle and comments on other deficiencies in the publicly available accounting data. In this context, the Feltham-Ohlson model was found more suited

to cope with such accounting problems of equity. The study also indicates that deficiencies in the reporting of employee stock option compensation, investments and derivatives might produce major inconsistencies in the examined valuation frameworks and distort their results.

MATERIAL AND METHOD

In this study, we started our research from a well-known formula for calculating the updated dividends. Using the mathematics and taking into consideration the information contained in the financial statements of an enterprise, we presented the theoretically based principles of the Feltham-Ohlson model. The method of research involved the regulations applicable worldwide, as regards the rules applicable in financial reporting of companies.

Next we will present the results and conclusions on this matter.

RESULTS AND DISCUSSIONS

The starting point of the Feltham-Ohlson approach is well-known formula for calculating the undated dividends $V_0 = \sum_{t=1}^n \frac{D_t}{(1+i)^t}$. The result is an equation for estimating the value of a company, depending on its equity [4].

The reference is Present Value Expected Dividends - PVED, which states that the market value of the equity (P_t) represents the present value of future dividends ($E_t(d_t)$), updated with the return on equity without risk (R_f):

$$P_t = \sum_{\tau=1}^{\infty} \frac{E_t(d_{t+\tau})}{(1+R_f)^{\tau}}$$

R_f represents an assumption for transactions that do not impose a risk and it is considered constant in the future.

The purpose is to make the same definition of value to current information on which investors can access, included in the financial statements. The first step on the financial assessment shows a series of stages involving the existence of a link between accounting information and market value. However, none explains the rational difference between the market price and the equity value determined by accounting.

Feltham-Ohlson model is defined primarily by a dual relationship between the global income and the net interest rate.

The first essential concept on which the model is based is the global income. It allows explaining the change of accounting value of equity (bv) during the year, reported to net profit value (x_t), decreased by paid dividends (d_t). It is the formula for CSN - Clean Surplus Relation, expressed as:

$$bv = bv_{t-1} + x_t - d_t$$

The global income approach allows the reconciliation between balance sheet information and the one referring to the nature of the activities (operational, financial). Thus, it presents a limitation on pay by the NIR - Net Interest Relation:

$$i_t = (R-1)fa_{t-1}, \text{ where:}$$

i_t – the income for financial activities;

fa – financial assets

R – actualisation rate $(1+R_f)$

Starting from these two fundamental relations, Feltham and Ohlson improved representation of obtaining cash flows, highlighting the difference between operating assets and financial assets [5].

Financial assets are expressed by FAR - Financial Assets Relation:

$$fa_t = fa_{t-1} + i_t - [d_t - c_t], \text{ where } c_t - (\text{free}) \text{ cash-flows}$$

while operating assets are expressed by OAR - Operating Assets Relation:

$$oa_t = oa_{t-1} + ox_t - c_t, \text{ where}$$

oa – operating assets;

ox – operating income.

The interest of this distinction is to identify two possible sources of cash-flows. One source is financial assets accounting, which are in principle remunerated at the rate required by the market, another is related to the operating assets, which can emit a higher profit than initially expected [6]. Then, goodwill appears which is qualified by the authors as “abnormal earnings”.

Feltham and Ohlson were considering the term of abnormal earnings as in residuals earnings, used in the model of excess profit, which is found in financial accounting.

There is the complementary remuneration of operating assets after they have satisfied the restriction of the expected market wage. It bears the name of Abnormal Operating Earnings - AOE and it is expressed as:

$$ox_t^a = ox_t - (R-1)oa_{t-1}$$

$$\text{where } ox_t = x_t - i_t$$

Starting from these relations, Equity Value Relation – EVR can be expressed as:

$$\bullet P_t = fa_t + \sum_{\tau=1}^{\infty} R^{-\tau} E_t[c_{t+\tau}] = fa_t + \sum_{\tau=1}^{\infty} \frac{E_t[c_{t+\tau}]}{(1+R_f)^{\tau}} - \text{the value of the enterprise}$$

corresponds to the value of financial assets, respectively the value of past undistributed cash-flows, transferred to financial assets, to which the amount of future cash-flows is added.

$$\bullet P_t = bv_t + \sum_{\tau=1}^{\infty} R^{-\tau} E_t[ox_{t+\tau}^a] = bv_t + \sum_{\tau=1}^{\infty} \frac{E_t[ox_{t+\tau}^a]}{(1+R_f)^{\tau}} - \text{using the accounting}$$

value of equity, this equality uses the difference between financial assets and operating assets.

If this view is satisfactory, it puts into practice a difficult problem: that of foreseeing the future abnormal earnings. Feltham and Ohlson use one of their fundamental contributions – LIM (Linear Information Model).

The model is based on data from three components of the financial statements: the balance sheet, the income statement, the statement of changes in equity. It is necessary to determine the relationship between current accounting and financial value, or, rather, between current accounting, the foreseeable income and abnormal earnings.

LIM meet this requirement. At its origin, it has more assumptions: persistence in time of the abnormal earnings, which comes from increased operating assets, without thereby accounting to be able to identify them under the precautionary principle.

LIM can be presented:

$$ox_{t+1}^a = \omega_{11}ox_t^a + \omega_{12}oa_t + v_{1,t} + \varepsilon_{1,t+1}$$

$$oa_{t+1} = \omega_{22}oa_t + v_{2,t} + \varepsilon_{2,t+1}$$

$$v_{1,t+1} = \gamma_1 v_{1,t} + \varepsilon_{3,t+1}$$

$$v_{2,t+1} = \gamma_2 v_{2,t} + \varepsilon_{4,t+1}$$

where:

ω_{11} - parameter „persistence of abnormal earnings”;

ω_{12} - parameter „going concern”;

ω_{22} - parameter “growth of operating assets”;

γ - parameter „persistence of other information”;

$v_{1,t}, v_{2,t}$ - variable „other information”.

The parameters ($\omega_{11}, \omega_{12}, \omega_{22}, \gamma_1, \gamma_2$) satisfy the following:

$$\omega_{11} \in [0,1), \omega_{22} \in [1,R), \omega_{12} \geq 0, \gamma \in [0,1)$$

According to these expressions, abnormal earnings depend very much on the abnormal operating benefits of the operating assets and on $v_{k,t}$ „other information”:

$$v_{1,t} = E_t[ox_{t+1}^a] - \omega_{11}ox_t^a - \omega_{12}oa_t$$

$$v_{2,t} = E_t[oa_{t+1}] - \omega_{22}oa_t$$

LIM presents two new ideas. First one is the principle of an integrated market information before it is written in the foreseeable results ($v_{k,t}$ is observed during t but it does not affect the results than during t+1), the second one is that the abnormal earnings should strive from 0 to infinity and that accounting value should strive to market value. These two ideas are opposite to assumption of a market in terms of random results.

The combination of LIM with the main concepts of FOM leads to final equality:

$$P_t = bv_t + \alpha_1 ox_t^a + \alpha_a oa_t + \beta_1 v_{1,t} + \beta_2 v_{2,t}$$

where:

$$\alpha_1 = \frac{\omega_{11}}{(R - \omega_{11})} \geq 0$$

$$\alpha_2 = \frac{\omega_{12}R}{(R - \omega_{11})(R - \omega_{22})} \geq 0$$

$$\beta_1 = \frac{R}{(R - \omega_{11})(R - \gamma_1)} > 0$$

$$\beta_2 = \frac{\alpha_2}{(R - \gamma_2)} \geq 0$$

After all, the model Feltham-Ohlson, show that the actual value of stocks (equity) depends on [3]:

- the accounting value of equity;
- a multiple of abnormal operating earnings;
- an impairment due to precautionary principle;
- the effect of other information.

CONCLUSIONS

The usual approach in terms of an evaluation model is to first establish a link between the present financial statements and the future ones, then between the future financial statements and the future dividends and, ultimately, between dividends and future financial value for the investors. Feltham-Ohlson model presents the advantage of making a real alternative to the traditional perspective, by simplifying it. The market value of equity is made based on financial foresight of accounting data.

Feltham-Ohlson model can be considered a kind of fulfillment of research on implications in assessing the fair value on estimated performance. The problems of information asymmetry between managers and investors become negligible, just as questions about its use in the actualization procedures find the answer in many practical aspects of the model.

The practical advantage represented by the use of accounting data does not imply a waiver of theoretical concerns. Model eliminates the limited horizon of financial foresights to which often arrive traditional approaches based on dividends. Also, LIM formally integrates the precautionary principle. The logic of the model is very positive for the transmitter of the information. This way, he can anticipate the influence of published information on the market value of equity.

Although the Feltham-Ohlson model has no transparent role for the management, there is a functional relationship between accounting and financial reports and optimal investment decisions. The presented model provides both an alternative rationale for published accounting data having information content and

an alternative framework for specifications of empirical testing of the market value of equity.

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