VALUATION METHODS- LITERATURE REVIEW

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Abstract: *This paper is a theoretical overview of the often used valuation methods with the help of which the value of a firm or its equity is calculated. Many experts (including Aswath Damodaran, Guochang Zhang and CA Hozefa Natalwala) classify the methods. The basic models are based on discounted cash flows. The main method uses the free cash flow for valuation, but there are some newer methods that reveal and correct the weaknesses of the traditional models. The valuation of flexibility of management can be conducted mainly with real options. This paper briefly describes the essence of the Dividend Discount Model, the Free Cash Flow Model, the benefit from using real options and the Residual Income Model. There are a few words about the Adjusted Present Value approach as well. Different models uses different premises, and an overall truth is that if the required premises are real and correct, the value will be appropriately accurate. Another important condition is that experts, analysts should choose between the models on the basis of the purpose of valuation. Thus there are no good or bad methods, only methods that fit different goals and aims. The main task is to define exactly the purpose, then to find the most appropriate valuation technique. All the methods originates from the premise that the value of an asset is the present value of its future cash flows. According to the different points of view of different techniques the resulted values can be also differed from each other. Valuation models and techniques should be adapted to the rapidly changing world, but the basic statements remain the same. On the other hand there is a need for more accurate models in order to help investors get as many information as they could. Today information is one of the most important resources and financial models should keep up with this trend.*

Keywords: firm value; residual income; free cash flow; discounted cash flow

JEL Classification: G32; G11

1. Introduction

In the last few years valuation and calculation of firm value became more and more important because of the changes in the business environment. Thus nowadays firms have the possibility to go directly to financial markets. To achieve this the information about the value of the firm is needed. Theoretically managers control the firm's property keeping in mind the stakeholders' interest, but actually the investors' decisions form the distribution of capital. Another need for business are present in nowadays business environment (Rogers, 2002).

The main purpose of a firm is to invest into assets that generate the biggest cash flows, to form production in order to have more and more incomes and profit, thus managers would like to increase firm value (Damodaran, 2006).

In order to calculate the changes in the value, first they have to be able to calculate the initial value and to define those factors, indicators which can have effects on it.

2. Basic terms

According to Natalwala, 2011 value is the present value of the future cash flows that originate from the analyzed possessions. Price, as he considers, the amount of money what a buyer paid for a property. Price is not equal to value, but in certain conditions they can be the same. Value depends on the valuation technique, which is determined by the purpose why the value is defined. One of the purposes is to create buy or sell agreements for which the value of the firm is indispensable. In the case of valuation process time is one of the most important parameter. The value calculated during the valuation process is valid at a definite point of time. Before or after this date another sum of money is the actual value of a property (Natalwala, 2011).

3. Traditional discounted cash flow models

Natalwala, 2011 introduces three approaches to valuation (the asset approach, the income approach and the market approach). From these the income approach uses the discounted cash flow model for valuation. With the help of the free cash-flow to firm the firm value could be determined, while with the help of the free cash flow to equity, the value of the firm equity could be calculated (Natalwala, 2011).

The free cash flow to firm is the free money that remains after paying the operational costs and taxes, meeting the working capital need, and fulfilling the capital reinvestment. The free cash flow to firm can be determined using the net income or the EBIT. The main goal of calculating the free cash flow is to define the amount of money which can be freely used by the debt and equity owners. Thus the earnigs before interest and taxes are corrected by some items in order to calculate the free cash flow. Such items are depriciation, amortization and all the other costs that were subtracted from the income in order to calculate profit, but did not involve actual cash outflows. Another item that should be taken into consideration is the so called capital expenditures, those investments that are necessary for the business. The type of the investments depends on the activity of the firm. The last main category of the items that are used to modify the EBIT is the working capital needs. The depriciation, amortization and other items that did not involve cash outflows should be added to the earnings before interest and tax, and the capital expenditures and working capital needs should be subtracted from it (Allman, 2010).

Net income is used for calculating not only the free cash flow, but this is the basis for the profitability ratios as well. These ratios are often used for comparing firms to each other within an industry. For example in the analytic framework of Rózsa, 2014 profitability ratios are included in order to compare firms with each other in Hungarian building industry. (Rózsa, 2014).

There are two main methods of value calculation based on free cash flows depending on the expected growth of the company. If one period of extraordinary growth is expected, then the company's growth rate reduces to a stable, lower long-term rate for the further period of time. In this case a multi-period model is used. Another case is when there is only one expected growth rate, then a single-period model is used based on the formula of the present value of perpetuity with stable growth rate (Natalwala, 2011).

Figure 1 shows the general corporate valuation model using free cash flows.

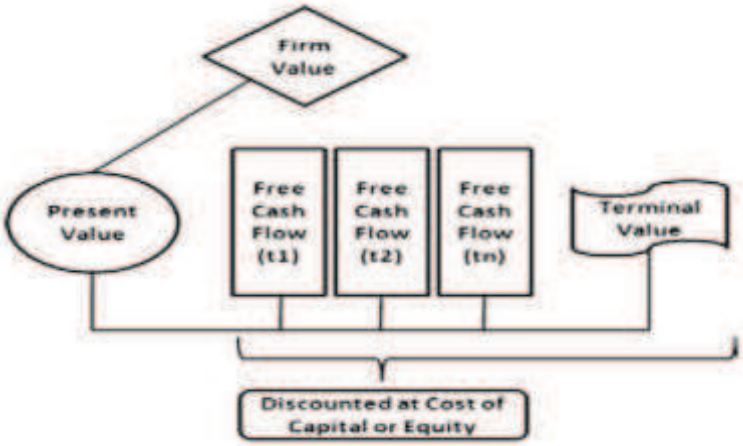

Figure 1: Corporate valuation process based on free cash flows
Source: Allman, 2010

Zhang, 2014 shows three finance approaches to evaluate a firm. He confirms that these approaches are a matter of choice but their main theoretical background is the same. The first approach is the dividend discount model, which essential is that the main payoff from the asset is the dividends, thus these cash-flows should be discounted in order to calculate the value of equity. This model is inappropriate when the forecasting of dividends is problematic because of a firm's less developed dividend policy (Zhang, 2014).
If the firm does not have a clear dividend policy, a kind of solution can be another model, which is based on the free cash flows. Theoretically the two approaches should result in the same outcome. Because of the fact that the dividend is the amount of money that is distributed and the free cash flow is the amount of money that can be distributed. Thus theoretically these two values should be equal to each other. But this situation emerges only when all the free cash flows are paid off as dividends or from the remaining surplus zero net present value investments are financed (Zhang, 2014). All the models belong to the discounted cash flow- based models.
The third model is using the investments for calculating the value. In this approach the value consists of two parts. The first is the capitalization of current earnings (which represents the value of the existing assets), the other is the capitalization of positive net present value investment possibilities. (Zhang, 2014)
To my mind using free cash flows to calculate value is the best effective method, because the amount of the dividends depend on many subjective parameters, like the managerial decision. Thus calculating all the capital that can be divided between the shareholders can show the value more effectively. On the other hand the cash flow which a firm can generate reflects its value better than its assets in my opinion.
According to Damodaran, 2013 one of the most useful approach to value a firm is using the free cash flow to firm. On the same basis for the valuation of equity free cash flow to equity should be used. He wrote down that the value of a firm is equal to the free cash flow to firm (FCFF) discounted by the weighted average cost of capital (WACC). This is the so-called intrinsic valuation, more precisely the discounted cash flow approach (Damodaran, 2013).
There are cases when the free cash flow to equity could not be calculated, for example in the case of financial service firms. In these cases not the cash flows, but the dividends will be discounted for calculating value (Damodaran, 2013).

For making the value calculation, there are several parameters that should be estimated. The first parameter is the cash flow, then the discount rates and the expected growth (how the calculated cash flows will change over time) should be evaluated (Damodaran, 2013).
A special issue is when a firm has got common and preferred stocks. If its free cash flow to firm is calculated using the net income to common stocks, then the dividends on preferred stocks should be added to it in order to get (beside other modifying factors) the free cash flow (Pratt, 2002).
Each of the discounted cash flow methods makes an assumption that the price of a company's stock embeds the expectation of the market how much rate of return can be expected from investing into the subject stock. The multistage DCF models (as above mentioned) use two or more expected growth rates for different periods of time (Pratt, 2002).
The analyst should choose such a discount rate for valuation that reflects the risks in the expected cash-flows (Damodaran, 2006).
According to Damodaran, 2006 there are four types of discounted cash-flow models. In the first model the expected cash flows should be discounted by a risk-adjusted discount rate, the main purpose in the second model is to get a certainty equivalent cash flow which is discounted at the risk-free rate in order to value an asset. The third model is the adjusted present value model. The last type of the discounted cash flow model calculates the value of a firm by using the excess returns that are expected from its investments (Damodaran, 2006).
There is a technique to get a final, conclusive value that is when an appraiser gives different weights to different techniques (Natalwala, 2011).
In my opinion this is not the most applicable method, because the different techniques have different purposes and premises, and the essence is to find a methodology that fits perfectly for the reason the analysis would serve.
One of the main problems of the discounted cash flow based approaches is that the decision should be made at the present, while the value of the cash flows are estimated for the future. Thus these models can many times underestimate the value of a firm. Another problem is that these models are static thus they do not calculate with the possibly changing business conditions (Abrams, 2010).
By contrast real option approach demonstrates the value of flexibility through taking into account the capability of the firm and its management to adapt to the variable conditions and environment (Rózsa, 2004).
Real option method is used for valuing assets that have similar attributions like options (Damodaran, 2006).
The discounted cash flow model can be complemented by the real options methodology which causes another aspect of valuation. Thus when a firm value is calculated, first the traditional methods should be used then the additional analysis can consist of value-adding analytics for example Monte Carlo simulation, portfolio optimalization and real options analysis. This process can result in a more appropriate and real value (Abrams, 2010).
Real options can complete traditional methods through being able to value assets in an uncertain business environment (Tarnóczi et al., 2011).
In my opinion the traditional methods are well-usable for valuation, but the value- adding processes take parameters and premises into consideration, that cannot be included in other valuation methodology. Thus the result can be more accurate and more realistic, and the investors can get more useful information for decisions.

4. Adjusted Present Value Approach

The adjusted present value (APV) approach is mentioned by Damodaran, 2006 as the third model of discounted cash flow-based valuation.

It separates the expected debt financing costs and benefits from the value of the assets. While in the traditional discounted cash flow models this effect is included in the discount rate, in the APV approach firm value is expected in three steps eliminating the debt effects. First the estimation of firm value without leverage should be conducted, then the positive and negative effects of borrowing money is taken into consideration through the present value of tax savings and the expected bankruptcy cost. The latter is subtracted from the sum of the firm value with no leverage and the present value of tax benefits. According to Natalwala, 2011 the asset approach is the one from the market, income and asset approaches that use the less objective parameter and assumptions. But the most important criterion is to choose a method that fits the most to the final goal and to choose the premises and standard sin order to serve the purpose of valuation (Natalwala, 2011).

5. Residual Income Model

Besides the above mentioned models there is another one which estimates equity value on the basis of the book value of equity and the expected future residual income (Zhang, 2014).

The Residual Income Model is considered an accounting-based valuation process, because the required elements can be acquired from the financial statements preparing by the firm. In this model the total firm equity consists of the book value of equity and the present value of residual income (Thomas and Gup, 2010).

Compared to the above mentioned approaches the new term is residual income which can be calculated as the difference between forecasted accounting earnings and normal earnings. The latter can be calculated using the book value of equity and the cost of capital (Thomas and Gup, 2010).

The so called normal earning is the multiplication of the book value of equity and the cost of capital for a firm (Thomas and Gup, 2010).

This residual income is calculated as the difference of earnings and cost of equity capital. This is a kind of net income which means the net value a firm generates during a period of time after it pays all the operation costs including the cost of equity capital. In the income statement there is a term „net income" but that is different form the one used in the Residual Income Model, because the former does not take into consideration the cost of equity capital. This approach is not fully new, previously the term „residual income" was mentioned (Zhang, 2014).

The first big difference between the discounted models and the residual income model is that the latter does not calculate the earnings for time of infinity because it considers this kind of calculation and forecasting impracticable. Meanwhile the discounted cash flow models calculate the present value of dividends and free cash flows if only they were infinite cash flow series (Zhang, 2014).

The residual income model is appropriate for firms that have only operating activities. The basic concept is that the financial assets are traded on markets that price these assets correctly, thus these are investments with zero net present value. But the operating assets are traded on less perfect markets thus they generate profit or loss. From the attributions of the two types of assets results that the book value of equity can be generated as the sum of the book value of financial assets (which show the exact value of these assets because of the perfect markets) and the book value of operating assets (which can be expressed as the present value of the free cash flows originating from operating activities). This kind of residual income model can be only used when the analyzed firm does not make its accounting on accrual basis (Zhang, 2014).

Thus there is a strict limitation on the use of this version of residual income model which can be used in the case of pretty few companies in Hungary for example.

The model of residual income has a feature that makes the accounting measures irrelevant to the valuation process. This can be conducted through a so called self-correction

process. This is regarded as a favourable feature by some researchers (e.g. Bernard in Zhang, 2014). But on the other side there are some experts who presume that this cause that the firms will not motivated to make correct and global financial reports. Kothari (in Zhang, 2014) mentions that this feature of the model is unfavourable from his point of view (Zhang, 2014).
In my opinion this feature is useful for the prediction and the valuation because self-correction makes it possible to correct the accidental misleading or unrealistic information. If we consider the free cash flow model, in that case investors also have to make calculations besides the financial statements, thus this is not an additional work for them, they only have a choice to make better calculations with this method.
The Residual Income Model has two basic conditions, DDM and the clean surplus relation (CSR), which is the only one that is needed for the transformation of DDM into RIM. Through this condition, in the equation of calculating the value instead of forecasted dividends, accounting variables are used (Zhang, 2014).
DDM is the dividend discount model, which estimates equity value as the present value of expected future dividend payoffs. This method can be efficiently used if there are no unexpected events and if the firm has got a predictable and well-planned dividend policy on the basis of which investors can forecast exactly when and exactly how much dividend will be paid (Zhang, 2014).
According to Damodaran, 2006 the basis for RIM is the assumption that lays behind net present value calculation as well. When net present value is defined, experts presume that only those investments increases the firm value that have positive net present value. Thus cash flows and earnings will only be calculated into the value (i.e. increases firm value) if they have got a bigger return than their cost (Damodaran, 2006).
Damodaran, 2006 highlights one of the weakness of the discounted cash flow models, that they do not make an explicit relationship between reinvestment and growth rate, while in the case of firms if they use their assets more effectively or they buy new assets and operate them, they can expect a higher growth rate. This weakness is corrected in the residual income model which link the two mentioned parameters (Damodaran, 2006).
In my opinion this feature makes the residual income model more accurate because there is an obvious relationship between the higher growth rate and innovation. Firms make new investments in the hope of higher earnings, thus the valuation model should take this relationship into consideration.
According to some researches the residual income model has better results, it can more precisely estimate the value than the models based on the discounted dividends or discounted free cash flows (e.g. Sougiannis in Zhang, 2014, Courteau et al. in Zhang, 2014, Francis et al. in Zhang, 2014). Other researchers (e.g. Lundholm and o'Keefe in Zhang, 2014) declare that there is no sense in comparing these methods because they have theoretically common basis, thus if one model gets a more precise value, it cannot be stated that this model is more effective or more precise than another one (Zhang, 2014).

6. Conclusion

All the mentioned models and techniques attempt to calculate the firms' value. All of them is based on the assumption that basically the value of a property is equal to the present value of the money it will generate in the future. The newer methods try to adapt to the new demands, the constantly changing world and the resulted new information claims.
There are several methods and techniques with which experts can evaluate a firm, but the most important criterion for choosing among them is the main purpose of valuation. All the techniques can be used for different aims, simultaneously they use different assumptions and premises.

Thus the first important task before starting a valuation process is to define the exact goal of it. Then the valuation method should be selected, and the premises have to be formed on the basis of the purpose and the model.

References

Abrams, J. B. (2010) *Quantitative Business Valuation- A mathematical approach for today's professionals*, Second edition, Hoboken: Wiley.

Allman, K. A. (2010) *Corporate Valuation Modeling: A Step-by-step guide*, Hoboken: Wiley.

Damodaran, A. (2006) *Valuation Approaches and Metrics: A Survey of the Theory and Evidence* [Online], Available: http://people.stern.nyu.edu/adamodar/pdfiles/papers/valuesurvey.pdf [06 April 2015].

Damodaran, A. (2013) *Valuation* [Online], Available: http://people.stern.nyu.edu/adamodar/pdfiles/acf3E/presentations/valuation.pdf [04 April 2015].

Natalwala, CA H. (2011) *Business valuation – Needs & Techniques* [Online], Available: http://220.227.161.86/17798business_valuation.pdf [03 April 2015].

Pratt, S. P. (2002) *Cost of capital- Estimation and Applications*, Second edition, Hoboken: Wiley.

Rogers, J. (2002) *Strategy, Value and Risk – The Real Options Approach*, London: Palgrave Macmillan.

Rózsa, A. (2004) Stratégiai beruházások reálopciós megközelítése, *Vezetéstudomány*, Vol. 35, No. 2, pp. 53-61.

Rózsa, A. (2014) Financial position of building industry in Hajdú-Bihar county (E-Hungary) in the period of 2008-2012: Regional sectoral analysis based on economic performance ratios, *Internaitonal Review of Applied Sciences and Engineering*, Vol. 5, No. 1, pp. 67-77.

Tarnóczi, T. and Fenyves, V. and Bács, Z. (2011) The Business Uncertainty and Variability Management with Real Options Models Combined Two-dimensional Simulation, *International Journal of Management Cases (IJMC)*, Vol. 13, No. 3, pp. 159-167.

Thomas,R. and Gup, B. E. (2010) *The Valuation Handbook: Valuation Techniques from Today's Top Practioners*, Hoboken: Wiley.

Zhang, G. (2014) *Accounting Information and Equity Valuation- Theory, Evidence and Applications*, New York: Springer- Verlag.