THE DETERMINATION OF THE COST OF EQUITY

ODREĐIVANJE VRIJEDNOSTI DIONICA

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Abstract: *There are many ways to implement the fundamental analysis to valuation of shares and cost of equity. A number of them are either directly or indirectly related to what sometimes referred to as cash flows discounted method. In this article we present the most used methods for determination of the cost of equity.*

Key words: *cost, equity, model, share, price*

Sažetak: *Mnogo je načina za primjenu osnovne analiza vrednovanja dionice. Neki od njih su bilo direktno ili indirektno povezani uz termin koji se nekada nazivao metoda priljeva sredstava diskontiranih novčanih tokova. U ovom radu predstavljamo najčešće korištene metode za određivanje vrijednosti dionice.*

Ključne riječi: *koštati, dionica, model, cijena*

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1. Introduction

By studying the balance sheet it is to be remarked that by adding up stockholders' equity with the share premiums, the revaluation reserves, the capital reserves, the accumulated retained earnings and the year result is obtained company's equity. According to the mentioned accounting regulations, the equity is the shareholders' or the partners' right over the assets of a company after the deductions of all its debts. The first and most important component of the equity is the stocholders' equity. The stocholders' equity is the fundamental condition of setting up a company, as this notion cannot be separated from the word "company", and it is the legal basis of the company and the shareholders or partners in their relationship with the third parties.

2. Determination's methods for the cost of equity

The stockholders' equity is the share of the shareholders in the firm stated in accounting terms and the product between number of issued shares by the firm and their par value represent stockholders' equity. The shares are securities which attest the owner's right of property over a part of stockholders' equity, together with the other social and patrimonial rights. According to the capital need, which may be either immediate or on term, the company issues shares, non-voting preference shares, subscription certificates. In our legislation, the express form stipulated is the issuing of shares. There are many ways to implement the fundamental analysis to valuation of shares and cost of equity. A number of them are either directly or indirectly related to what sometimes referred to as cash flows discounted method. This method states that "true" or is "intrinsec" value of any asset is based on the cash flows that the investor expects to receive in the future from owning the asset. Because these cash flows are expected in the future, they are adjusted by a discounted rate to reflect not only the time value of money but also the riskiness of the cash flows. Algebraically, the "intrinsec" value of the asset, P_0, is equal to the sum of the present values of the expected cash flows:

$$P_0 = \sum_{i=1}^{\infty} \frac{CF_i}{(1+a)^i} \qquad (1)$$

where: CF_i = the expected cash flow at time "i"; a = the appropriate discount rate for cash flows of this degree of risk, assumed to be the same for all periods. Because the cash flows associated with an investment in any particular shares are the dividends that are expected to be paid throughout the future on the shares purchased, the models suggested by this method of valuation are often known as dividend discounted model. In accordance with this model, the valuation of shares has that foundation the investment evaluation, that is we will follow the estimated cash flows that are expected in the future from this investment.Thus, in accordance with the general discounted model, the current share price (P_0) is equal with present value of the future cash flows which are generated by share: dividends and resale price. The

discount rate used is return rate expected by shareholders to reflect prospects of the company and, also, the riskiness of the cash flow. Therefore:

$$P_0 = \sum_{i=1}^{n} \frac{D_i}{(1+R_c)^i} + \frac{P_n}{(1+R_c)^n} \quad (2)$$

where: D_i = the dividend per share expected in "i" year; P_n = the resale price of the share at the end of "n" years; n = the investment period; R_c = the return rate expected by shareholders (the equity cost rate). This formula is named basic formula of Irving Fisher. Starting from equation (2) we can obtain the folowing derivated relationship:

$$P_0 = \sum_{i=1}^{n} \frac{D_i}{(1+R_c)^i}, \text{ cu } n \to \infty \quad (3)$$

This formula is used when we can estimate year dividend per share for an infinite period, so the resale price can be unsignificant or even zero. This formula is named Dividend Discounted Model (DDM). Starting from basic DDM we can obtain the different types of tractable DDMs which reflect different sets of assumptions about dividend growth rates: the constant growth model; the zero growth model; the two-stage and three stage models.

2.1 The constant growth model (the Gordon – Shapiro model)

Because general discounted model supposes to make forecast of dividends for lifetime of investment, a hard thing, otherwise, and the forecast more difficult of the resale price of the share after "n" years, the proce what depends of a lot of juncture factors, the economists M.J. Gordon and E. Shapiro, proposed a simplier model (1956). This model assumes that dividends will grow from period to period at the same rate forever (g) for an infinite period. Thus, if we suppose that the current dividend is D_0 (in fact, it is the dividend per share which is paid in current year for previous year), we obtain:

$$\begin{cases} D_1 = D_0(1+g) \\ D_2 = D_1(1+g) = D_0(1+g)^2 \\ D_3 = D_2(1+g) = D_0(1+g)^3 \\ \dots \\ D_n = D_{n-1}(1+g) = D_0(1+g)^n \end{cases} \quad (4)$$

Therefore, DDM is rewritten as:

$$P_0 = D_0\left[\frac{1+g}{1+R_c} + \left(\frac{1+g}{1+R_c}\right)^2 + \dots + \left(\frac{1+g}{1+R_c}\right)^n\right] \quad (5)$$

$$\text{If we note } A=\frac{1+g}{1+R_c}\text{, we obtain: } P_0= D_0 \cdot A\left[1 + A + \ldots + A^{n-1}\right] \quad (6)$$

In the bracket we have a geometrically series, and therefore:

$$P_0= D_0 \cdot A \cdot \frac{1 - A \cdot A^{n-1}}{1 - A} = D_0 \cdot A \cdot \frac{1 - A^n}{1 - A} \quad (7)$$

Substituing A with its value, we will obtain:

$$P_0= D_0(1+g) \cdot \frac{1 - \left(\frac{1+g}{1+R_c}\right)^n}{R_c - g} = \frac{D_1}{R_c - g}\left[1 - \left(\frac{1+g}{1+R_c}\right)^n\right] \quad (8)$$

$$\text{In the simplified assumption, } g<R_c, \lim_{n\to\infty}\left(\frac{1+g}{1+R_c}\right)^n \to 0 \quad (9)$$

$$\text{and , therefore:} \qquad P_0 = \frac{D_1}{R_c - g} \quad (10)$$

Conversely, for $g>R_c$, we will obtain o infinity price, which is a totally unrealistic thing. This model is named Gordon and Shapiro model or constant growth dividend discount model. The obtained result constitute an easy instrument to use for the valuation of the shares, which can be easy modified for shorter periods and realistic growth schemas. So, concerning cost of equity, this will be:

$$R_c = \frac{D_1}{P_0} + g \quad (11)$$

The valuation of cost of equity using this model raises, in principal, the problem of forecast of the dividend growth rate "g". This forecast is realised either using the past information about growth rate, or using the model of the return growth expected by shareholders based on financial leverage. Thus, dividend growth rate will be: $g = b \cdot R_f$
The dividend growth rate per share is computing and used in this manner only if the number of shares is constant. Conversely, it must be adjusted.

2.2. The zero growth model

In accordance with this model, we assume that future dividends will not increase and that they will remain at a fixed amount. Therefore, it is the case of the zero growth shares when expected dividends for next years will be equal (constant).

Thus: $D_0=D_1=D_2=...=D_n=D$

$$P_0 = \sum_{i=1}^{n} \frac{D}{(1+R_c)^i}, \text{ with } n\to\infty \quad (12)$$

or after the computing: $$P_0 = \frac{D}{R_c} \text{ and } R_c = \frac{D}{P_0} \quad (13)$$

2.3. Two- stage and three-stage models

The two-stage model and the three-stage model is sometimes used by investors. Thus, the two-stage model assumes that a constant growth rate g_1 exists only until some time p, when a different growth rate g_2 is assumed to begin and continue thereafter. The three-stage model assumes that a constant growth rate, g_1, exists only until some time p, when a second growth rate, g_2, is assumed to begin and last until a later time q (q>p) when a third growth rate, g_3, is assumed to begin and last thereafter. In fact, these models can be viewed like particular cases of the multiple growth model.

3. Conclusion

The method presented before states that "true" or is "intrinsec" value of any asset is based on the cash flows that the investor expects to receive in the future from owning the asset. Because these cash flows are expected in the future, they are adjusted by a discounted rate to reflect not only the time value of money but also the riskiness of the cash flows. Because the cash flows associated with an investment in any particular shares are the dividends that are expected to be paid throughout the future on the shares purchased, the models suggested by this method of valuation are often known as dividend discounted model. Starting from basic DDM we obtained, in our paper, the different types of tractable DDMs which reflect different sets of assumptions about dividend growth rates: the constant growth model; the zero growth model; the two-stage and three stage models.

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