PATTERNS FOR DETERMINING THE COST OF EQUITIES

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ABSTRACT

The cost of equities represents the rate of return required by the shareholders of the company, to provide a return on their investment in its heritage.

Significant in this respect, there are the size of future profit and general meeting of shareholders decisions on distribution ratio of net profit for the year for dividends. The return required by shareholders is an opportunity cost based on return expected by investors for investment with the same risk.

KEY WORDS: cost of equities, discount rate, internal rate of return, future revenue streams, initial cost of share

From legal and accounting perspective, the concept of cost of equities has no real meaning. From this perspective, the cost corresponds to services that the company undertakes to provide to third parties for their contribution with real or financial resources. Thus, wages, rent or interest appears as a binding for the use, by the company, of labor force, goods and capital.

Legal and accounting, equity do not usually appear as costs generators, because they do not give rise to any legal obligation to pay interest on behalf of the company associates. It is the reason for which the payment of the dividends is not considered, by the accounting, as an expenditure deductible from the result, but as a sampling conducted on the already calculated result, after taking into consideration all incomes and expenses.

But, if the use of equities does not imply any legal constraint pay for the company, it still involves an economic constraint. This requires it to provide special pay to its associates, so as not to preclude any possibility of future financing by own funds. In fact, a company that provides its associates an insufficient pay may not be able to request new contributions to equity.

In a joint stock company for example, shareholders, who do not receive satisfactory dividends, taking into account the possibilities offered by other investments, will refuse to subscribe to future capital increases.

Moreover, they will be tempted to give up their shares and can thus lead to a devaluation of securities, which will make impracticable any decision to raise equity.

It is possible that the pay in the form of dividends provided to associates and owners to reach very low levels or even be null for many years. However, this observation does not cancel the previous analysis. In fact, these companies provide a payment to owners or shareholders which, in essence, does not appear in the form of dividends.

Thus, in these companies, it is often that owners payment is made by using the salary increases trick, compared to their level for employees who are not associates.

Also, owners frequently accept to take small samples of results because they hope in asset accumulation and thus in achieving an increase of wealth in the future. Because of their potential benefits they tend to give up a current income in favor of a future income, which is hoped to be more attractive, but they do not waive all pay.

Associates or company owners express the requirement of remuneration, whatever its form. In this way, the company which must ensure that remuneration supports economic constraint, this being the origin of their equities cost. Although equity may appear at first sight as a "free" resource, it generates an economic constraint pay, so a cost.

The cost of equity is more difficult to measure than the debt. The company takes in case of loans, clear commitments to pay its lenders, which allows the cost of its debt to be measured with certain precision. Instead, commitment to the owners is formal which makes the costs measuring quite difficult.

Next, we will debate on the equity cost issue for a general case, and then we shall deal with the calculation in two simple cases: that of a company providing a stable payment and that of a company providing a constant increase in remuneration granted to its associates.

a. *The general case*. An investor intending to buy shares of a company at P_0 course is faced with a problem of investment.

In fact, the operation regarded involves:

• P_0 immediate payment;

• future earnings as dividends D_1, D_2, ..., D_n and eventually Pn as a resale price of the shares in the future.

If you anticipate the future revenue streams, or at least formulate hypotheses on the evolution, the investor will be able to determine the actual rate of return in respect of the operation in question. This is the discount rate r, which cancels the present net value of the project and thus reviews the following expression:

$$-P_0+\frac{D_1}{(1+r)^1}+\frac{D_2}{(1+r)^2}+...+\frac{D_n}{(1+r)^n}+\frac{P_n}{(1+r)^n}=0 \quad (1)$$

As the Pn price will be determined by anticipating dividends for the future buyer, we can write:

$$P_0=\frac{D_1}{(1+r)}+\frac{D_2}{(1+r)^2}+...+\frac{D_j}{(1+r)^j}+...+\frac{D_n}{(1+r)^n}+... \quad (2)$$

$$P_0=\sum_{j=1}^{\infty}\frac{D_j}{(1+r)^j} \quad (3)$$

The R rate measures the actual return in question or due to investors willing to pay the P_0 price for the company shares. It thus corresponds to a yield requirement made by actual or potential shareholders of the company whose securities are subjected to comparison and competition with securities issued by other companies.

This yield requirement carries a constraint on company issuing the shares, which is urged to ensure a certain level of remuneration to its shareholders, to avoid being put in the position to see that its securities are depreciating and that its future funding through equities will disappear.

• The cost of equity for a company providing stable dividends. If a joint stock company would provide stable dividends to shareholders over a long or medium period of time a new shareholder may consider buying a stock as an investment that involves:

• an initial cost corresponding to the purchase price of an action (or action) P_0;

• a real stable income received after year 1, 2, 3, ..., n. ...

You can measure the internal rate of return r which allows verifying the equality:

$$-P_0+\frac{D_1}{(1+r)^1}+\frac{D_2}{(1+r)^2}+...+\frac{D_n}{(1+r)^n}+...+=0 \quad (4)$$

$$P_0=\frac{D_1}{(1+r)}+\frac{D_2}{(1+r)^2}+...+\frac{D_n}{(1+r)^n}+... \quad (5)$$

The initial cost of share = The current value of future dividends

Thus,

$$P_0=D[\frac{1}{(1+r)}+\frac{1}{(1+r)^2}+...+\frac{1}{(1+r)^n}+...] \quad (6)$$

In brackets in the above relation, we have the sum of the first n terms of a geometric progression with n tending to infinity.

Knowing that $(1 + r)^{-n} = \frac{1}{(1+r)^n}$

It can be shown that:

• the first term of the progression is $(1+r)^{-1}$;

• the ratio is $(1+r)^{-1}$ because each term is obtained by the multiplication of ratio and the previous term.

But if we write this progression from right to left we have:

• the first term $(l+r)^{-n}$ with n tending to infinity;

• ratio (1 + r).

It shows that the sum of the first n terms of a geometric progression with first term C and ratio R, is:

$$S_n = C\frac{R^n - 1}{R - 1} = C\frac{1 - R^n}{1 - R} \tag{7}$$

In these conditions we can write:

$$P_0 = D[(1+r)^{-n}\frac{(1+r)^n - 1}{(1+r) - 1}] = D[(1+r)^{-n}\frac{(1+r)^n - 1}{r}] \tag{8}$$

Expanding the term in brackets, we have:

$$P_0 = D\frac{(1+r)^{-n}(1+r)^n - (1+r)^{-n}}{r} \tag{9}$$

But, $(1 +r)^{-n}(1 +r)^n = 1$

It follows that:

$$P_0 = D\frac{1 - (1+r)^{-n}}{r} \tag{10}$$

When n is infinitely large, the expression $(l+r)^{-n}$ tends to 0. Therefore the limit P_0 will be:

$$P_0 = \frac{D}{r} \tag{11}$$

This expression is a formula for assessing. It means that possible buyers of shares consider the P_0 price they are willing to offer, for an infinite sequence of constant dividend D at a discount rate r. Moreover, this formula corresponds to that which allows evaluation of a perpetual annuity because it provides the current value of a constant, perpetual payment.

Opposite, if you know the P_0 price paid for the purchase of shares (for example quotation for a listed company) and if you can make a credible hypothesis on the level of stable dividends expected by the buyers of securities, you can infer r, internal rate of return required by the investment in shares.

This rate occurs as the rate of return required by equities providers or, from the company's point of view, as the specific cost of these equities.

b. *The cost of equities for a company that provides constant dividends increasing rate.* If potential shareholders of a company anticipate increasing dividend with a stable g rate, internal rate of return for their investment in shares is the r rate, thus:

$$-P_0+\frac{D_1}{(1+\mathrm{r})}+\frac{D_2}{(1+\mathrm{r})^2}+...+\frac{D_n}{(1+\mathrm{r})^{\mathrm{n}}}+...+=0 \quad (12)$$

results,

$$P_0=\frac{D_1}{(1+\mathrm{r})}+\frac{D_2}{(1+\mathrm{r})^2}+...+\frac{D_n}{(1+\mathrm{r})^{\mathrm{n}}}+... \quad (13)$$

If D_1 is the first expected dividend after this acquisition, we have:

$D_2 = D_1(1+g)$;
$D_3 = D_2(1+g) = D_1(1+g)^2$;
.....
$D_n = D_{n-1}(1+g) = D_1(1+g)^{n-1}$

results,

$$P_0=\frac{D_1}{1+r}+D_1\frac{1+g}{(1+\mathrm{r})^2}+D_1\frac{(1+g)^2}{(1+\mathrm{r})^3}+...+D_1\frac{(1+g)^{n-1}}{(1+\mathrm{r})^{\mathrm{n}}}+... \quad (14)$$

$$P_0=D[\frac{1}{1+r}+\frac{1+g}{(1+\mathrm{r})^2}+\frac{(1+g)^2}{(1+\mathrm{r})^3}+...+\frac{(1+g)^{n-1}}{(1+\mathrm{r})^{\mathrm{n}}}+...] \quad (15)$$

The parenthesis corresponds to the sum of the first n terms of a geometrical progression,with n tending to infinity, in which:
- the first term $C = (1+r)^{-1}$;
- ratio $R = (1 + g) / (1 + r)$.

The general formula of such sums is written:

$$S_n=C\frac{R^n-1}{R-1} \quad (16)$$

We have:

$$P_0=D_1[\frac{1}{1+r}x\frac{(1+g)^n/(1+r)^n-1}{(1+g)/(1+r)-1}] \quad (17)$$

$$\Rightarrow P_0=D_1[\frac{1}{1+r}x\frac{(1+g)^n/(1+r)^n-1}{(1+g-r-1)/(1+r)}] \quad (18)$$

$$\Rightarrow P_0=D_1[\frac{1}{1+r}x\frac{(1+g)^n/(1+r)^n-1}{g-\mathrm{r}}] \quad (19)$$

If $g<r$, $(1+g)^n/(1+r)^n$ tends to 0 when n tends to infinity. In these conditions, when $n \to \infty$, we find:

$$g<r \Rightarrow P_0=\frac{D_1}{r-g} \quad (20)$$

This formula allows a subscriber interested in buying shares to evaluate the course that he would accept to pay for the purchase of a security that brings increasing dividends every year at a constant g rate. Opposite, the r rate which verifies this equality is the internal rate of return, required by the investor who pays the P0 today to purchase a share from which he expects future dividends D1, D2, ..., Dn, ... increasing at the constant g rate.

$$r = \frac{D_1}{P_0} + g \qquad (21)$$

This rate of return required by potential shareholders defines the company's remuneration constraint and allows it to determine the cost of equities.

Assume shares with a value of 20 lei each, which pays dividend of 2 lei, while the annual growth rate expected by investors is 5%. In these conditions the expected rate of return is:

$$r = \frac{2 + 2x5\%}{20} + 5\% \quad = 0{,}105 + 0.05 = 0{,}155 \text{ sau } 15{,}5\%$$

Bibliography

1. Feleagă N., Malciu L. - Recognition, Evaluation and Estimation in International Accountancy, CECCAR Publishing House, Bucharest,, 2004

2. Duţescu A. – Accounting Information and Capital Markets, Economic Publishing House, Bucharest,2000

3. Cenar I., Deaconu S. C. – Accounting life of firm from the formation to bankruptcy, CECCAR Publishing House, Bucharest, 2006

4. Jianu I. – Measurement, presentation and analysis of business performance, CECCAR Publishing House, Bucharest, 2007