THE ANALYSIS OF FINANCIAL EQUILIBRIUM THROUGH THE COST OF THE INVESTED CAPITAL

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ABSTRACT: *The financial equilibrium of a company can be analyzed through the cost of the invested capital. It is the most pragmatic approach of the financial equilibrium analysis because it takes into account the cost of invested resources, their capacity to account return. I suggest a model to approach the analysis of the balanced average cost of the invested capital using the method of chain substitutions. I reached the conclusion that the main consequence of changes in the balanced average cost of the capital is on the company's value.*

KEY WORDS: *the financial equilibrium, the cost of the invested capital, the cost of the equity capital, the factors of influence, method*

JEL CLASSIFICATION: *D22, M10.*

1. INTRODUCTION

The financial equilibrium of a company can be analyzed through the cost of the invested capital. It is the most pragmatic approach of the financial equilibrium analysis because it takes into account the cost of the invested resources, their capacity to account return.

It can be stated that there are two ways to estimate the invested capital:

- the invested capital estimated on the side of liabilities, shows the way the invested capital was formed on sources of origin (which belong to the company or are borrowed), as well as on payability (permanent or on short-term), being known as economic capital;
- the invested capital estimated on the side of assets, shows the way it is budgeted on different terms and liquidity, being known as economic assets.

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a) Estimated on the side of liabilities, the invested capital (Cinv) represents the sum of equity capital (Cpr) and loans, no matter their maturity. Attracted sources are not part of the invested capital.

$$CINV = CPR + ÎTML + ÎTS = CPERM + ÎTS \quad (1)$$

Where: CINV – invested capital;
CPR - equity capital;
ÎTML – medium and long-term loans (bank credits, leasing, bond issue);
ÎTS – short-term loans (short-term bank credits and other types of capital whose maturity is less than a year);
CPERM – permanent capital.

b) Estimated on the side of assets, the invested capital is given by the following formula:

$$CINV = AIN + NFR + DB = NFP + TA \quad (2)$$

Where: AIN = net fixed assets;
NFR = need in working capital;
DB = available funds;
NFP = need in permanent working capital;
TA = treasury on the side of assets.

No matter the used method, the result is the same, there are the same values, only the interpretation is different.

According to the principle of financial equilibrium, between resources and uses on terms, there must be an adequate cover of the need financed by permanent resources and these permanent resources, that are fixed assets and the need in working capital, have to be covered by equity capital and long and medium-term loans.

2. THE ANALYSIS OF THE BALANCED AVERAGE COST OF THE INVESTED CAPITAL

The balanced average cost of the invested capital represents the money the company has to pay to capital suppliers.

The return on invested capital is made according to its type:

- according to the sources of origin:
  - equity capital, supplied by shareholders;
  - loan capital, supplied by creditors.
- according to the payability:
  - permanent capital made up of equity capital and financial resources borrowed on medium and long-term;
  - short-term capital, made up of short-term bank credits and other types of capital whose payability is shorter than a year.

The balanced average cost of the invested capital is given by the individual cost of the elements and their importance in the total invested capital. It is very useful to analyze the balanced average cost of the invested capital which has to bring its contribution to the process of establishing the structure of the cost of invested capital according to the cost of each category, so that the cost of all financial resources which were invested should be as low as possible.

In our opinion, in order to establish the balanced average cost of the invested capital or the cost of the company's capital, there must be taken some steps:

- to establish the cost of capital for each financing resource;
- to establish the value of each financing resource in the total invested capital;
- to establish the balanced average cost which results as the sum of the cost of all financing resources and the value it represents in total resources.

Thus, it must be established the historic cost of the invested capital given by:

- the cost of the equity capital;
- the cost of the loan capital.

2.1. The cost of the equity capital

It is a very complicated task to establish the cost of the equity capital.

a) A first possibility to establish the cost of the equity capital is the following: the cost of the equity capital equals the rate of return expected by shareholders.

The rate of return expected by shareholders corresponds to the minimal rate of return which urges the potential shareholder to buy a share and makes the shareholder to keep the existing securities (Culp, L.C., 2001).

The cost of the equity capital in a structure of given capital

It is possible to establish the cost of the equity capital with the method which resorts to dividends.

Because, unlike bonds, shares have no due date, it can be considered that the present value of a share or the price of a share (PA) equals the updated sum of future dividends:

$$Pa = \frac{D1}{(1+Ca)} + \frac{D2}{(1+Ca)^2} + \ldots + \frac{D}{(1+Ca)} \qquad (3)$$

Where: Pa = price of „a" share;

Dt = dividends at the moment t = 1, 2,….;

Ca = cost of share or rate of return expected by shareholders.

If it is supposed that the initial dividend Dt increases regularly with an increasing rate noted with g, the following situation can result:

$$P = \frac{D1}{1+Ca} + \frac{D1(1+g)}{(1+Ca)^2} + \ldots + \frac{D1(1+g)}{(1+Ca)} \qquad (4)$$

The cost of new shares

The issue of new shares implies for the company expenses to issue new shares:
- expenses related to new shares;
- advertising expenses;
- bank charges.

The size of these expenses often depends on the importance of issue and represents almost 10% of the sum of the new issue.

In order not to penalize long-standing shareholders when issuing new shares (dilution of benefits), the new investments of the company must generate a high rate of return, in order to allow the distribution of dividends, whose present value equals the net price the company receives for its new share.

If: PN = net price charged by the company for a share;
CN = cost of the new share;
Dt = dividends at the moment t (t +1, 2,…), then:

$$PN = Dt / (1+CN)\ t \qquad (5)$$

The net price charged by the company for a new share is:

$$PN = P\ (1-e) \qquad (6)$$

Where: e = issuing expenses, expressed in percentage, out of the total sum of the issue.

Taking into account the hypothesis that the dividends are to grow with a rate growth noted with g, then:

$$P(1-e) = \frac{D1}{Cn-g} \qquad (7)$$

and the cost of the new share is: $Cn = \frac{D1}{P(1-e)} + g$ (8)

The cost of reserves

The reserves or the benefits which are not distributed have a cost (CR), an opportunity cost or an implicit cost. This cost can be considered equal to the rate of return expected by shareholders for their shares.

Some authors consider that the cost of reserves is an opportunity cost which equals the rate of return the company can get when placing its funds outside the company.

The cost of preferred shares

When a company issues preferred shares and when it receives Pn for each new share, the cost of these preferred shares (Cp) equals:

$$C_P = \frac{Dp}{Pn} \qquad (9)$$

Where: Pn – net price charged by the company for a preferred share;
Dp – dividends paid to preferred shares.

b) Another way to establish the cost of equity capital is to make a balanced average of the costs of the equity capital elements.

Thus:

- the cost of the issued capital equals the updated rate which assures the fact that the existing value of future dividends equals the capital subscribed by shareholders;
- the cost of net profit equals the value of financial profitability;
- other elements of equity capital.
  - the reserves are considered as the cost at the level of financial profitability or at the present value of equity capital cost;
  - the capital bonuses are assimilated to issued capital ;
  - the reserves from evaluation are considered at the level of economic profitability.

This method has several weaknesses because it associates different elements, which sometimes are temporally inadequate or inadequate by nature (Berstein, et al., 2001).

The balanced average cost of the invested capital is an association of different elements which presents a temporal gap. Concerning the nature, at the beginning they are financial, but through the process of investment and allocation (for circulating assets), they get different economic forms. Thus when they are used, they have different returns, as a concept, and implicitly, as a way of estimation.

c) Another possibility to establish the cost of the equity capital is to consider it an opportunity cost, considered at the level of the rate of financial profitability of the previous year.

According to this reasoning, the capital is maintained in business by shareholders only if the level of their return equals at least the level of the previous year. If the shareholders stay in business, it can be concluded that they either are satisfied by their earnings, either they postponed their withdrawal hoping that in future they will get higher earnings which justify their decision to wait. Thus, the subscribed funds will be invested in the next financial year at the level of financial profitability specific to the previous year (Crouhy M., 2001).

Due to very slow and not very flexible movements of capital under the present circumstances of our country, this method of estimating the cost of the equity capital is more difficult to establish because it is difficult to withdraw one's funds from a business and reinvest them immediately in an opportunity.

2.2. THE COST OF THE LOAN CAPITAL

Debts are represented by:

- loans from banks and specialized financial institutions;
- bonds issued on the financial market.

The cost of the debt can be established before the payment of taxes on profit (taking into account that in Romania, in order to encourage economic activities, trading companies and foreign investments, this tax was exempt from payment for periods between 6 months and 5 years, depending on the type of activity), as well as after the payment of the tax on profit (it is the case of economic agents which cannot benefit of exemptions or exceed the period the exemption is offered).

The cost of debt before taxation

The specific cost of the loan is established starting from the existing value. If the company has contracted a debt noted with E, which implies annual reimbursements (interests + annuity to be reimbursed) that are equal to E1, E2…, En, the specific cost of debt Cd is established by the following formula:

$$\frac{E_1}{1+Cd}+\frac{E_2}{(1+Cd)^2}+\ldots+\frac{E_n}{(1+Cd)^n} \quad (10)$$

Cd is established as the calculation of an internal rate of return, starting from the updated tables.

The cost of debt after taxation

The rate of interest after taxation equals:

$$\text{Cd x (1- I)} \quad (11)$$

Where: I is the rate of profit taxation.

The tax on profit reduces considerably the cost of debt for companies, because the financial expenses, in general, can be deducted.

When the company shows a deficit, the cost of the debt remains at the level it was before taxation, since it cannot deduct its financial expenses (or at least a part of them) from its gross profit. (Avare, et al., 2004)

The balanced average cost of the invested capital is given by the formula:

$$\overline{K}_{CINV}=\frac{CPR}{CINV}\cdot K_{CPR}+\frac{\hat{I}TML}{CINV}\cdot K_{\hat{I}TML}\cdot(1-T)+\frac{\hat{I}TS}{CINV}\cdot K_{\hat{I}TS}\cdot(1-T) \quad (12)$$

Where: CINV – invested capital;
CPR – equity capital;
ÎTML – medium and long-term loans;
ÎTS – short-term loans;
Kcpr – cost of equity capital;
Kîtml – cost of medium and long-term loans;
K îts – cost of short-term loans;
T – tax rate.

The number of terms used in the formula can grow depending on the type of medium and long-term or short-term debt. The company can contract several long-term

bank credits at different tax rates. Then, their cost may vary during the credit contract depending on the evolution of credit market. The same goes for short-term credits or leasing or bond issue.

Or the company can consolidate its financial structure by issuing new shares that can be common or preferred. So, in fact, the individual level of the cost on types of capital is an average which depends on the moment it is established.

In the case of small companies, the above formula is not valid because they pay taxes on income instead of taxes on profit.

In our opinion, the capital optimum cost is the minimum value of the balanced average cost which results from a financial structure which assures in the same time the maximization of company's value. It is expected that the balanced average cost has a tendency to limit (stop) the debt when there is no positive leverage of debt.

The cost of invested capital in absolute value can be established by multiplying the volume of invested capital by the balanced average cost of the invested capital, according to the formula:

$$K_{CINV} = C_{INV} \cdot \overline{K}_{CINV} \tag{13}$$

Previously, I mentioned that the return on invested capital is done:
- according to the sources of origin;
- according to payability terms.

1) The cost of resources on sources of origin

a) The average cost of equity share:

$$\overline{K}_{CPR} = \sum_{i=1}^{n} \frac{C_{PRi}}{C_{PR}} \cdot K_{CPRi} \tag{14}$$

b) The average cost of loan capital (long, medium and short-term loans): $K_{\hat{I}T}$

$$\overline{K}_{\hat{I}T} = \frac{\hat{I}TML}{\hat{I}T} \cdot \overline{K}_{\hat{I}TML} \cdot (1-T) + \frac{\hat{I}TS}{\hat{I}T} \cdot \overline{K}_{\hat{I}TS} \cdot (1-T) \tag{15}$$

Where: $K_{\hat{I}T}$ – average cost of total loans

ÎT – total loans (ÎTML +ÎTS)

If this cost is lower than that of equity capital, then there is a positive leverage of debt.

2) The costs of resources on terms of payability

a) The average cost of permanent capital

$$\overline{K}_{CPERM} = \frac{CPR}{CPERM} \cdot \overline{K}_{CPR} + \frac{\hat{I}TML}{CPERM} \cdot \overline{K}_{\hat{I}TML} \cdot (1-T) \tag{16}$$

If this cost is higher than that of treasury credits, then it is better to finance the need in working capital with short-term credits, but only within the limit in which the financial situation of the company is not endangered.

b) The average cost of short-term loans

$$\overline{K}_{\hat{I}TS} = \sum_{i=1}^{n} \frac{\hat{I}TSi}{\hat{I}TS} \cdot K_{\hat{I}TSi} \cdot (1-T) \tag{17}$$

Previously, I mentioned that the balanced average cost of invested capital is given by the formula:

$$\overline{K}_{CINV} = \frac{CPR}{CINV} * K_{CPR} + \frac{\hat{I}TML}{CINV} * K_{\hat{I}TML}(1-T) + \frac{\hat{I}TS}{CINV} * K_{\hat{I}TS}(1-T) \tag{18}$$

The formula can also be written:

$$\overline{K}_{CINV} = \frac{CPR}{CINV} * K_{CPR} + \frac{\hat{I}T}{CINV} * K_{\hat{I}T}(1-T)$$
$$= Raf_{CINV} * K_{CPR} + R\hat{i}g_{CINV} * (1-T) \tag{19}$$

Where:

$\hat{I}T$ - total loans (ÎTML+ÎTS);

Raf_{CINV} - rate of financial autonomy of invested capital or economic creditworthiness;

$R\hat{i}g_{CINV}$ - rate of total debt relative to invested capital

A suggestion on how to analyse the balanced average cost of the invested capital

I suggest that the analyse of balanced average cost should be done using the method of chain substitutions.

This method is specific to economic and financial analysis which emphasizes the influence of change in factors on the change in indicators, assigning to the qualitative factor what is left and was not factorized.

The method consists in :

- identifying the factors which influence the deviation of economic phenomenon;
- establishing the causal relations between factors and phenomenon;
- measuring the influence of factors, establishing the sense and the intensity of their action.

The method of chain substitutions implies that some conventional rules must be obeyed, rules which result from and are accepted by economic practice and theory on the basis of applied experiments, namely:

a) The factors of influence of the analysed indicator must be established;

b) The factors are arranged according to a very clear and precise order, which is logical from an economic point of view, that is: quantitative factors, structural factors and qualitative factors;
c) Once arranged, the factors substitute themselves succesively, first the quantitative factor, then the qualitative factor, this substitution emphasizes the size and the sense of the influence of the substituted factor;
d) A substituted factor keeps on being included when making some estimations at its effective level, that is the level of the indicator reached during the period of analysis. The factors which were not substituted are included when making estimations at the level they were in the main period;
e) The last factor which is substituted is the qualitative one, this one having the same economic nature as the analysed factor.

The method of chain substitutions has some characteristics depending on the relation the indicators are formed:

- product relation, the change is expressed by absolute deviation (ΔF) or by relative variation;
- rapport relation, the change is expressed by absolute deviation (ΔF) or by relative variation.

According to this method, the analysis of the balanced average cost of the invested capital is realised using the following formula:

$$\overline{K}_{CINV} = \frac{\sum_{i=1}^{n} Ci \cdot Ki}{\sum_{i=1}^{n} Ci} = \sum_{i=1}^{n} gsi \cdot Ki \qquad (20)$$

where:
Ci – sum in absolute size of „i „ categories of capital i = 1- n;
Ki – individual level of capital cost (the cost of capital for „i" categories of capital);
gsi – value of „i" capital categories in total invested capital or, in other words, the structure of invested capital.

The absolute deviation of the analysed indicator, that is the change from one period to another, is given by the formula:

$$\Delta\overline{K}_{CINV} = \overline{K}_{CINV_t} - \overline{K}_{CINV_0} \qquad (21)$$

The factors of influence of the balanced average cost of invested capital:

- the structure of invested capital;
- the cost of each type of capital;

where:
Ci – element of invested capital
Ki – the cost of the elements of invested capital, they being factors of first degree.

The structure of the invested capital depends, at its turn, on the rate of financial autonomy and the rate of total debt relative to invested capital, these being factors of influence of second degree.

So:

$$\Delta\overline{K}_{CINV} = \overline{K}_{CINV_t} - \overline{K}_{CINV_0} = \Delta\overline{K}_{CINV_{(\Delta g)}} + \Delta\overline{K}_{CINV_{(\Delta k)}} = \sum_{i=1}^{n} g_{it}k_{it} - \sum_{i=1}^{n} g_{i0}k_{i0} \quad (22)$$

the last factor which is substituted is the cost relative to each type of capital, it is the qualitative factor, which has the same economic nature as the analyzed indicator.

The influences of factors on the analyzed indicator

1. The influence the change in the structure of invested capital has on the change of average cost of invested capital:

$$\Delta\overline{K}_{CINV_{(\Delta g)}} = \sum_{i=1}^{n} g_{it}k_{i0} - \sum_{i=1}^{n} g_{i0}k_{i0} \quad (23)$$

1.1. The influence the change in the rate of financial autonomy and in the rate of total debt relative to invested capital has on the change of the analyzed indicator:

$$\Delta\overline{K}_{CINV_{(\Delta g)}} = [\, Raf_{CINVt} * K_{CPR0} + Rig_{CINVt} * K_{IT0} * (1-T)_0 \,] - [\, Raf_{CINV0} * K_{CPR0} + Rig_{CINV0} * K_{IT0} * (1-T)_0 \,] \quad (24)$$

The relation between the rate of financial autonomy and the rate of total debt relative to invested capital can be expressed as it follows: $\text{Raf}_{\text{CINV}} = \text{l-Rîg}_{\text{CINV}}$.

Thus the influence of the change in each factor of second degree has on the change of the average cost of the invested capital can be estimated.

1.1.1. The influence of the change in the rate of financial autonomy of the invested capital has on the change of the analyzed indicator:

$$\Delta\overline{K}_{CINV\left(_{\Delta RafCINV}\right)} = \begin{array}{l}[Raf_{CINVt} * K_{CPR0} + (1 - Raf_{CINVt}) * K_{IT0} * (1-T)_0] - \\ -[Raf_{CINV0} * K_{CPR0} + (1 - Raf_{CINVt}) * K_{IT0} * (1-T)_0]\end{array} \quad (25)$$

1.1.2. The influence of the change in the rate of total debt relative to invested capital has on the change of the analyzed factor:

$$\Delta\overline{K}_{CINV\left(_{\Delta RigCINV}\right)} = \begin{array}{l}[(1 - Rig_{CINVt}) * K_{CPR0} + Rig_{CINVt} * K_{IT0} * (1-T)_0] - \\ -[(1 - Rig_{CINV0}) * K_{CPR0} + Rig_{CINV0} * K_{IT0} * (1-T)_0]\end{array} \quad (26)$$

2. The influence of the change in the cost of each type of capital has on the change of the average cost of the invested capital:

$$\Delta\overline{K}_{CINV_{(\Delta K)}} = \sum_{i=1}^{n} g_{it}k_{it} - \sum_{i=1}^{n} g_{it}k_{i0} \quad (27)$$

2.1. It is useful the separation depending on the financial structure of the invested capital. The deviation can be explained on the basis of the change in the cost elements depending on the financial structure on sources of origin, which in fact shows us if the management used accordingly the resources according to cost (if the principle of debt leverage is respected: the average cost of the equity capital must be higher than that of total financial loans):

$$\Delta\overline{K}_{CINV_{(\Delta k)}}=[Raf_{CINVt} * K_{CPRt} + Rig_{CINVt} * K_{ITt} * (1-T)_t] - [Raf_{CINVt} * K_{CPR0} + Rig_{CINVt} * K_{IT0} * (1-T)_0] \quad (28)$$

2.1.1. The influence the change of the average cost of the equity capital has on the change of the analyzed factor:

$$\Delta\overline{K}_{CINV\left(_{\Delta kCPR}\right)} = Raf_{CINVt}(K_{CPRt} - K_{CPR0}) \quad (29)$$

2.1.2. The influence the change of the average cost of total loans has on the change of the analyzed factor:

$$\Delta\overline{K}C_{INV\left(_{\Delta kIT}\right)}=[Rig_{CINVt} * K_{ITt}(1-T)_t] - [Rig_{CINVt} * K_{IT0} * (1-T)_0] \quad (30)$$

If there is an increase of the elements of capital which cost less than the average, then there is a decrease of the balanced average cost of the capital.

If there is an increase of the elements of capital which cost more than the average, then there is an increase of the balanced average cost of the capital.

The analysis of the balanced average cost of the invested capital emphasizes that:

- The intensity of the action of the structure of the invested capital depends on the size of the differences between the individual level of costs of „i" categories of capital. The structure of the invested capital takes action because the individual level of capital costs is different for each category of capital (each category of capital can have a different individual level of cost). The structure doesn't take action when the individual level of capital cost is equal for all types of capital, when there is only one category of capital or an exception when the influences are compensated for at the average level of the cost of the invested capital.
- The change of the structure is based on different values which attract capital on categories. The values are changed by the different rhythm of attracting capital on categories.
- The company's management can influence the average cost of the invested capital almost exclusively only on the basis of the changes that appear in the values of different categories of capital which have individual costs.
- The individual level of capital categories usually cannot be modified only by the company's action, they being the result of the financial and bank environment in which the company operates. They depend on several factors, from which we mention:

- external factors: the degree of development of the financial and bank market, the degree of development of the financial and bank tools, the diversification degree of capital suppliers, the degree of development of the economy in general (the inflation rate, the currency depreciation rate, the budget deficit, the balance of payment, the economic growth, the taxation system, the economic and financial culture etc.);
- internal factors: the efficiency and viability of businesses that are carried on, the company's size and its power to negotiate, the debt of the company, the company's creditworthiness and the stability of guarantees, the financial and top management.

I reached the conclusion that the main consequence of the change in the balanced average cost of capital is on the company's value. The value of a company in debt increases only if the leverage takes action that is the rate of economic profitability is higher than the average cost of loan capital, the debt increasing the financial profitability.

Thus, there must be the following relation:

$$Rrf > Rre > \overline{K}\,CÎMP \qquad (31)$$

where : Rrf – the rate of financial profitability;

Rre – the rate of economic profitability;

$\overline{K}$ CÎMP – the average cost of loan capital.

Thus, the cost of equity capital must be higher than the average cost of loan capital. The main consequence of the change in the balanced average cost of the capital is on the company's value.

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