Analysis of the influence factors on the capital cost

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15 June 2011

ANALYSIS OF THE INFLUENCE FACTORS ON THE CAPITAL COST

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ABSTRACT

The capital structure refers to the long-term financing types used by the enterprises (for example, reinvested profit, long-term shares and debts) and the way they are financed by a combination of the own capital and debts.

An optimal structure of the capital involves making some important decisions regarding the maximization of the enterprise value by their managers. But these decisions are not important only for maximizing the enterprise value, but also for the impact they have on the enterprises ability to face the competition existing on the market. An optimal structure of the capital should provide to the shareholders bigger gains than the ones they would gain from an economical entity fully financed by the own capitals.

In the attempt to explain the way the enterprises finance their assets and the factors influencing these financing decisions, a series of theories and models of the capital structure have been suggested. These theories and models try to explain the percentage of the debts and of the own capital found in the enterprises balance sheet.

Among the theories of the capital structures that have been imposed in time, Modigliani and Miller's theorem (1958) may be considered as the starting point of explaining the capital structure, although, it subsequently proved to be a purely theoretical model with no solid empiric funding[i]. The basic idea of this classic theory is that, in the absence of the taxation and on a perfect market, the value of an enterprise is not influenced by the way it is financed.

KEY WORDS

Capital structure, target share of indebting, theory of ranking the financing sources, timing with the market, influence factors of the capital structure specific to the enterprise, panel data patterns, generalized method of moments.

CONTENT OF THE PAPER

Any manager should know the capital structure and the value of a firm in order to be able to make decisions if the respective firm is adequately financed. The capital structure offers in this sense the first information about the financial status of a firm. For the manager of a group of firms, the capital structure becomes important for the continuity of its activity.

The efficiency of the financing decisions in frame of the enterprise depends, in the first place, on the capital cost. For the evaluation of an investment project, it is needed the knowledge of the cost of the employed resources. The rule of the value of an investment involves, indeed, the fact that the capitalization share of a project should be at least equal or, if not, higher than the share representing the opportunity cost of the capital. If the capitalization share is higher or equal to the capital cost, the enterprise may respect its commitments to the fund suppliers.

The mix between the loan titles and the ones of the own capital of a firm is called **capital structure.**

There are several factors influencing the decisions regarding the capital structure of the firm. These factors may be classified in intern and extern factors of the firm.

The main *extern factors* are:

The market conditions- the conditions existing both on the real estate markets and on the monetary markets may have an important influence on the optimal structure of the firm capital.

Competitive structure of the branch – the ability to honour the debts also depends on profitability. The settlement of the profit shares is as important as the settlement of the sales.

The taxes – the interest is a deductible cost in fiscal purpose, and these deductions have a very big value for the firms that are in an interval of applying a big share of taxation. The bigger the share of the profit tax is for a certain firm, the more advantageous is for it to use the borrowed capital.

Attitudes of the creditors and of the classification agencies. Irrespective of the analysis made by managers regarding the adequate factors of indebting for their firm, the attitudes of the creditors and of the classification agencies still influence frequently the financing decisions. In most of the cases, joint stock companies discuss the financial structure they want to adopt with the credit bidder and with the classification agencies and give an important weight to their advice.

The main *intern factors* are:

Sales stability – a firm having relatively stable sales may use the borrowed capital in a bigger proportion and may suffer bigger settled costs than a company having unstable sales.

Probability of bankruptcy and the risks associated to it. As long as the indebting level increases, the probability of bankruptcy also increases.

Intern conditions of the firm – the intern conditions of a firm may also influence the capital structure established as a purpose.

Structure of the assets – the firms whose assets are adequate to be used as a guarantee for the credits, tend to use as much as possible the borrowed capital. Thus, the long-term settled assets may be used for obtaining mortgage credits.

Increasing share – the firms having a faster increasing share should be based more on financing with borrowed capital because a bigger increase needs more the financing of the current assets or the creation of new capacities of production.

Profitability- the firms having values of the big share of the investment capitalization (ROI - return on investment) use relatively less borrowed capital. Theoretically, these tendency has no justification, but the reasoning leading the financial managers of these firms seems to be the firms generating big cash flows need no loans and there is no better use of the money than the investment in the own firm.

Attitudes of the managerial team – the managerial team can make decisions regarding the adequate capital structure.

Financial flexibility – the purpose of keeping a financial flexibility supposes, from the operational viewpoint, the keeping of an adequate reserve of the loan ability. The financial flexibility supposes the existence of a capacity of the enterprise to mobilize the resources necessary for the financing of a business at any moment.

The basic financial resource of a firm is represented by the cash flows obtained from assets and operations. When the firm is entirely financed by the own capital, all the cash flows belong to the shareholders. When the firm is financed both by borrowed capital and by the own capital, the cash flows are divided in two parts: a relatively flow secure belonging to the creditors and a riskier flow belonging to the shareholders.

On the market, we notice that most of the high-tech companies (bio-technology, high technology, Internet companies) are almost entirely based on financing of the own capital, while the retailers, the utility firms, the banks are based on the borrowed capital.

The simple balance sheet of a firm, expressed in market values, is presented:

Assets	Liabilities
Value of the cash flows obtained from the settled assets and from the firm operations	Market value of the debts Market value of the own capital
Firm value =	**Firm value**

The value of the flows produced by the firm assets (left of the balance sheet) may be assimilated to the "pie size" and the right of the balance sheet may be seen as the "portioning of the pie".
A company may share its cash flows in as many parts as it wants, but the entire value of those parts will always be equal to the non-portioned value of the cash flows: *the pie value does not depend on the way it is sliced!*

Franco Modigliani and Merton Miller (MM) received the Nobel Prize for applying this basic idea, at the corporative finances. In 1958, MM showed that **the value of a firm does not depend on its capital structure, when there are no taxes, and the capital markets work well**. So, the financial executive may not increase the company value by changing the financial mix.

The so-called **MM's 1st sentence** (MM sentence related to the irrelevance of indebting) says that, **in ideal conditions, the indebting policy of a firm should not matter for the**

<table>
<tr><td></td><td><u>The own capital only</u></td><td></td><td><u>Debts & the own capital</u></td></tr>
<tr><td rowspan="2">Firm value</td><td>$ 1 million

Own capital</td><td>=</td><td>$ 500 000
Debts
———
$ 500 000
Own capital</td></tr>
</table>

<table>
<tr><td rowspan="2">Expected result</td><td>$ 125 000

Income for own capital</td><td>=</td><td>$ 50 000
Interest of the debt
———
$ 75 000
Income for own capital</td></tr>
</table>

shareholders.
When the firm is financed only by own capital, all the income in operating are incomes belonging to the own capital. When the firm is 50% financed by debt and 50% by own capital, the income from operation is divided between creditors and shareholders, but not in a 50:50 report. The shareholders receive more than 50%.

Does that mean that shareholders have a better situation?

Modigliani and Miller deny it. Shareholders have more risks, this is why they have the right to receive bigger yields. The financing by debt does not affect the operating risk (the income from operation is the same: $ 125000), but **the financial risk**. Having only half of the own capital to absorb the operational risk, the risk on share is doubled.

	No debts	**With debts**
Efficiency on share	**12,5%**	**15%**
	10% + **2,5%**	10% + **2 x 2,5%**

When the company has no debts (it does not face a financial risk), the shareholders demand a bonus of 2,5% over the interest rate (10%). When the company is financed with 50% debts, fact that leads to a double risk on share, the shareholders demand a double bonus over the interest rate.

The indebting (**the lever effect**) increases the efficiency expected by the shareholders, but it also increases the risk, at the same time. The two effects are annulled, so that the firm value remains the same.

But what is the capital cost in the two cases?

Since the restructuration (introducing the debt) does not change the gains from operation or the firm value, they should not change the capital cost either.

	The own capital only	**With debts**
The own capital cost	**12,5%** = 1,25	**15%** = 1,5
The indebting cost	-	**10%**
The capital cost	**12,5%**	**12,5%**
		(0,5x10% +0,5x15%)

MM's 2nd sentence argues that the efficiency of the own capital of a indebted firm increases directly proportionally with the report of the debt/own capital in order to cover the additional financial risk.

In conclusion, **Modigliani and Miller's sentences suggest that the policy referring to the indebting should not matter** and still, the financial executives are worried about the indebting policy.

Why?

Because in the real world there are taxes, and **the financing by indebting has an important advantage: the gain is fiscally deductible**.

Let's introduce in our *example* a tax of 35%. The profit and losses account for the two companies will be:

	No debts	**50% indebting**
Income from operation (EBIT)	$ 125 000	$ 125 000

Interest	0	**50 000**
Gross income (EBT)	125 000	75 000
Tax (35%)	43 750	26 250
Net income	**81 250**	**48 750**
Combined income for debts & own capital	**81 250**	**98 750**

We may notice that the combined income is bigger for the indebted firm, with $ 17 500, representing exactly the amount of the fiscal economies. The net income increases with $ 17 500. Since the creditors do not receive more than the agreed interest, the entire profit obtained from the fiscal advantage gets to the shareholders.

If the $ 17 500 are a permanent income, the present value of this perpetuity is calculated by dividing the cash flow to the upgrading rate. What would be the correct upgrading rate for such a flow? The risk of the fiscal advantage is the same as the one of the interest (10%).

So, the present value of the fiscal advantage is $ 175 000 (17500/0,10).
If the firm has no debts, the company value is the present value of perpetuity of $ 81250 (a perpetuity to which we will apply an upgrading rate of 12,5% - capital cost).
In this case, the value is of $ 650 00, so minus 35% (the interest rate) of the initial $ 1 000 000.

The indebted firm will have a bigger value due to the present value of the fiscal advantage:

$$\$ 650 000 + \$ 175 000 = \$ 825 000$$

According to MM's 1st sentence, the "pie" value does not depend on the way it is shared between creditors and shareholders, but, we actually have to consider a third slice of the "pie": the one of the Government.

The value before taxation is not changed by "slicing the pie". Anyone who is able to make the firm to reduce the Government part, will let more for the others. A possibility: **to borrow capital** (fact that reduces the taxes paid by the firm and increases the flows to the shareholders).
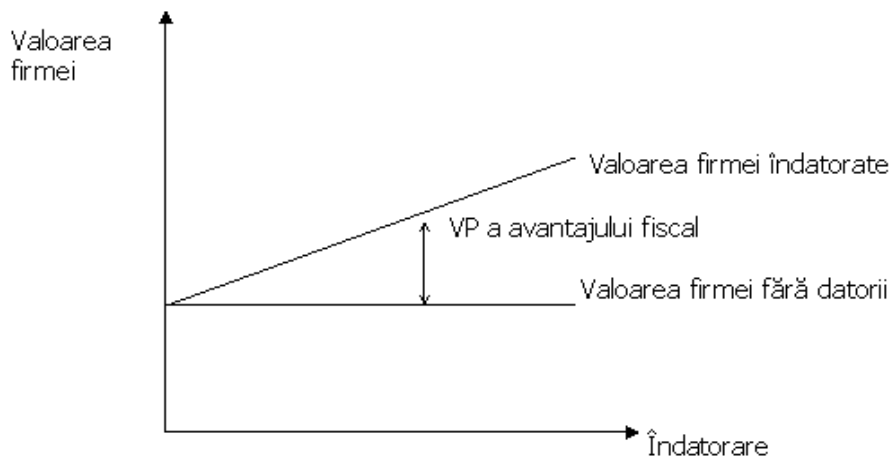
Value of the indebted firm	=	Firm value	+	Present value of the fiscal advantage
		No debts		
V_i	=	V_u	+	T x D

By introducing the taxes in the equation, not only we notice the change of the firm value (the indebted firm has a bigger value than the non-indebted one), but there is also a change (a decrease) of the capital cost:

CMPC = the cost after taxation of the debt x the debt weight + the own capital cost x the own capital weight

In our case:

$$CMPC = (1 - 0,35) \text{ x } 10\% \text{ x } \frac{\$500000}{\$825000} + 0,15 \text{ x } \frac{\$325000}{\$825000} = \mathbf{9,85\%}$$

In a world with taxes, the company should borrow capital in order to maximize its value and minimize the capital cost.

But the more the firm is indebted, the higher is the probability of bankruptcy.

The compromise theory argues that the indebting decision of the firm is a compromise between the fiscal advantage brought by interests and the bankruptcy cost.

As long as the debt level is average, there is a low probability of bankruptcy, so that the fiscal advantage of indebting also dominates and the value of the indebted firm increases.

But there is a moment when the probability of bankruptcy increases fast by supplementing the debt and the present value of the fiscal advantage is crossed, leading to the decrease of the firm value.
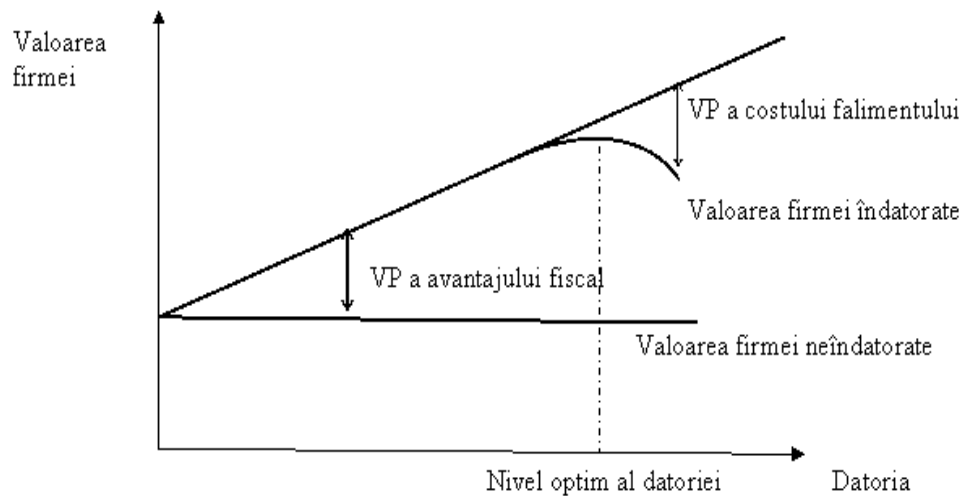
Therefore, there is **an optimal degree of indebting,** for which the present value of the fiscal economies, due to the additional loans, is crossed by the increase of the present value of the bankruptcy cost, and the value of the indebted firm is maximum.

This optimal level (a target degree of indebting) vary depending on the firms: the companies having secure, tangible assets may direct towards a bigger degree of indebting, while the

unprofitable companies with having intangible actives that present risks will choose a bigger weight of the own capital.

By using the specific factors previously mentioned, we have elaborated a regression model, having as dependent variables the total indebting degree and the long-term one. The used regression model is a "two-way" dynamic model with *panel data,* whereas we analyse the financing behaviour of the Romanian enterprises of the sample (N=109) for 5 years (T = 5). Generally, a dynamic model supposes the use of the first lag of the dependent variable as an explainable variable. In case of our dynamic model, we have removed the developing variable), whereas the coefficient for this variable is not significant from the statistical viewpoint.

The used dynamical model with panel data has the following final form:
$$GI_{it} = c + aGI_{t-1} + b_1 \mathrm{Pr}of_{it} + b_2 Marime_{it} + b_3 Tang_{it} + \mu_i + \eta_i + \varepsilon_{it}$$
$$cu\ i=1,2\dots..109. t =1,2\dots5.$$

The dependent variable GI_{it} represents one of the three dependent variables, respectively the total degree of indebting calculated as a report between the total debts and the total debts plus the own capitals, the total degree of indebting calculated as a report between the total debts and the total assets and the long-term indebting degree calculated as a report between the long-term debts and the total debts plus the own capitals. Gi_{it-1} is the first lag of the dependent variable.

μ_i represents the stochastic effects specific to every enterprise, η_i represents the settled effects specific to the time (those macro-economical variables influencing the capital structure of the enterprises), and ε_{it} represents the residual variable.

Most of the applications using data panels consider the errors such as: uit = αi + εit, where *αi* is the component of the error specific to the individual *i,* and εit is the stochastic component of the error (corresponding to the error of the usual regression, cross-sectional). There are several types of models of data panel.

As a source of incertitude, we consider as alternatives the volatility of the prices and the exchange rate measured by a GARCH model, and the technique of estimating the relation, the aggregated investment-incertitude is the generalized method of the GMM moments.
The standard procedure of estimation demands the definition of certain instrumental variables in order to correct the endogenous feature of the **X** columns and to correct the correlation between the dependent variable and wastes.
Since finding clearly exogenous tools is a problem hard to solve, it is a usual practice to choose the tools among the lags of the variables of the right member. Particularly, if we suppose that $E[u_t \,|\, X_t] = 0$, then the lags having the order bigger than 2 may be used as tools for estimating the equation. This condition is likely to be accomplished if the *ut* is not serially correlated.

By using these tools, the GMM (generalised method of moments) estimation procedure accomplished by the generalized method of the moments is likely to be an efficient technique of estimation.

CONCLUSIONS
We consider that all the theories and models mentioned above are useful in order to explain certain aspects related to the financing behaviour of the enterprises. The presented models contain determinant factors of the capital structure, factors that are different depending on the country, depending on the features of the market economy of every country (the value of the frozen assets, the enterprise size, the opportunities of increase of the enterprise, profitability).

According to the results obtained by most of the studies consecrated to the capital structure, we may affirm that the profitability represents the most important influencing factor of the capital structure whereas, depending on the nature of the correlation between this and the indebting rate of the enterprise, we may reject or accept the presence of one of the two theories of the capital structure: balancing theory (positive correlation - Myers, 2003) or the ranking theory of the financing sources (negative correlation- Myers & Majluf, 1984). Referring to the other determinant factors of the capital structure, in most of the studies it is relieved a tendency of increase of the indebting degree at the same time with the increase of the enterprise size, of its opportunities of development and of the weight of the corporal assets totally active[ii].

Regarding the financing behaviour of the Romanian enterprises, we may affirm that these call in a smaller extent the financing by indebts, whereas the total indebting degree (35%) and the long-term indebting degree (10%) are much smaller than in the developed countries and even smaller than the other developing countries. The factors specific to the enterprise influencing the total indebting degree of the Romanian enterprises are profitability, enterprise size and the assets tangibility. The correlation between profitability and the total indebting degree is negative and statistically significant. This correlation supports the hypotheses of the ranking theory of the financing sources according to which the profitable enterprises use less the borrowed capitals, whereas they have more intern resources they may use. Regarding the coefficient for the enterprise size, this is positive and strongly significant for the total indebting degree and negative for the long-term indebting degree, indicating the fact that the great Romanian enterprises have a better access to contracting loans, whereas they have a better reputation and a smaller probability to enter bankruptcy. Referring to the assets tangibility, the coefficient for this variable is negative and statistically significant for the total indebting degree and positive for the long-term indebting degree, suggesting the fact that the enterprises listed at BVB use the corporal assets as guarantees only for the long-terms loans.

Based on the obtained results referring to the correlations between the indebting degree and the factors specific to the enterprises, we may state that, among the theories of the capital structure, *the new ranking theory[iii]* is the one funding the financing behaviour of the Romanian enterprises quoted at BSE. According to this theory, the enterprises are firstly financed by the undistributed profit, then by the own capitals and finally by loans.

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[i] *(Ross, Westerfield & Jaffe, 1993)*
[ii] (Rajan & Zingales, 1995; Titman & Wessels, 1988)
[iii] (Chen, 2004)