The Financial Structure Influence on the Cost of Capital and Enterprise Value

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Abstract
All enterprises seek to maximise the value of the assets and minimize the costs. Thus, they will explore the weighting of each way of financing (own funds or debt) in total financing, i.e. optimize the financial structure of the enterprise and maximising its value. On the other hand, they are trying to determine the weighting of each way of financing, that leads to maximising of the enterprise value and to minimise the cost of capital. So, the paper present the arbitrage used by an investor into an enterprise without debts and into an enterprise indebt, using the model Modigliani and Miller, relating to the financing policy neutrality towards the average cost of capital and the value of the enterprise.

Keywords: capital structure, cost of capital, tax savings, return on assets, return on equity

JEL Code: G32

1. Introduction
Theoreticians also discussed and discuss much on the edge of the optimal structure concept of the capital. Some of them (C. Munteanu and C. Văslan, in the paper "International investment. Introduction in the study of direct foreign investment") even challenge the real base of the concept, stating that the proportion of the own capital and borrowed capital not influencing much the market value of an enterprise. In any case, we must admit that the determination of an optimal structure of the capital is a difficult problem. Although the modern financial theory explains the influence of the capital structure on the cost and enterprise value, it not offers an operational model for establish with precision which must be the optimal structure of the capital of an enterprise.

Beyond the live controversy that are in connection with the capital structure theory is deemed that for identifying the optimal is necessary to know the enterprise risks and estimated earnings that it will generate. Once being in possession of such information, it can get the optimal structure problem for finding the funds with the lowest cost. So, enterprises are trying to determine the weighting of each way of financing, that leads to maximising of the enterprise value and to minimise the cost of capital [9].

Regarding the optimal structure of the capital, in the paper "Firm’ Finances", N. Hoanță said that: "The optimal structure of the capital is the structure that ensure an optimum balance between risk and income and, so, maximise the enterprise value. Shareholders or enterprise associates benefit from the capital structure change if and only if the company value increase after this changes. Thus, the heads of companies must choose the structure of the capital which they believe that will lead to increasing the firm value to be beneficial for the enterprise owners"[5].
Economists Modigliani and Miller, it's the Nobel prize for economics, based on a theoretically model have formulated the first theorem that the value of an enterprise is independent of its financial structure: "In conditions in which there is no profit tax, the total market value of the firm is independent by the capital structure. The total market value is the expected future operating profits flow, updated with an appropriate rate of the risk class of the business in which the enterprise act" [6].

The practice has proved that an increase in the financial lever have lead to an increase in the profit expected by shareholders. However, the increasing in the financial lever size has also, as a result a financial risk. In accordance with the models of Modigliani and Miller, these two factors are cancelled each other in the sense that the capital structure is irrelevant in determining the market value of the enterprise.

The conclusion of Modigliani and Miller that the enterprise value not depends on the capital structure relies on a number of assumptions, including the absence of any profit tax. If is introduced the profit tax, because of the taxation deduct of the interest, the enterprise which use the financial lever will be assessed at a higher value than an enterprise which does not seek to debt, under the same class of business risk and the same flow of the future revenues expected.

2. Modigliani and Miller Model

The capital always presented a cost whose impact has been found in the degree of development of the society. To create the gross domestic product is needed by the capital, capital which in turn to present a cost, and this cost is characterized by an impact on the development process at the micro and macro-economic level. If we recognize the cost using interest, dividends, the impact is reflected in the gross domestic product both categories of resources, as well as the categories of uses. On the categories of uses, we recognize this impact in the consumption on the one hand, and on the other side to the gross fixed capital (which we can consider a cost i.e. a cost of giving up to the consumption) [3].

One of theories which have been based on the explosive development of financial science and practice means the model of economists Franco Modigliani and Merton Miller, developed in 1958, relating to the financing policy neutrality towards the average cost of capital and the value of the enterprise, given only the level of flow and risk of future cash-flows. The major contribution of M&M on irrelevance is to draw attention to the manner in which the financial chooses might affect the value of shares. The financial decisions are important to the extent to which they affect the expected revenues, and the best choice is that maximise this revenues. Therefore must be decided as choosing a business affect the net profits expected and the interest expense [4].

The initial model starts from a series of premises [2], which have led to many controversies, but they are not reduced the theoretical and practical value of the model:

- in the financial market, operators have a rational conduct, seeking to maximise the usefulness function of their wealth: maximising the enterprise value, the shareholders wealth;
- the model does not take in calculation of the enterprise value, the revenue observed in the past, but the forecast of the future revenues;
- enterprises are classified in homogeneous groups from point of view of dividend per share, as anticipated revenue. Also, all enterprises of a homogeneous class are characterized by the same economic risk;
- enterprises operating in the financial markets which respect the atomicity condition;
in each of the risk classes taken into account, the market value of a financial title issued by the enterprise must be proportional to income hoped for the envisaged enterprise; the financial titles are traded on a perfectly financial market.

The conclusions presented and demonstrated by Modigliani and Miller in 1958 are:

I. in the absence of taxation, the market value of the enterprise is independent by the capital structure, and in this context, the weighted average cost of capital is independent by the financing structure of the enterprise;

II. the rate of return on equity estimated for an enterprise with debts from class of risk \( i \), is a linear function of rate debt: 

\[
rf_j = re_i + \left( re_i - rd \right) \times \frac{D_j}{CP_j},
\]

where: 
- \( rf \) = rate of return on equity; 
- \( re_i \) = rate of return on assets of the enterprise \( j \), for titles in the class of risk \( i \) (weighted average cost of capital); 
- \( rd \) = interest-rate (cost debts in the absence of taxation); 
- \( D_j \) = enterprise debts; 
- \( CP_j \) = own capital of the enterprise \( j \).

The relationship above highlights that an enterprise with debts will obtain a more rate of return on equity, to the same weighted average cost of capital. The solution of debt burden of the enterprise must’t but absolute, as the increase in the return on equity may be interpreted as a necessity charged by shareholders of the enterprise in debt to demand a premium of financial risk, as a result of the joint structure of financing adopted by the enterprise.

Thus, Modigliani and Miller take into account the market imbalance, considering that in those situations, investors will sell shares of the enterprise in debts and it will buy of those of the enterprise without debts, up to eliminate of the profit opportunities. This will occur when the values of the two firms will be equal and balance on the market is restored.

Still, offering an example to illustrate the neutrality of the financial structure, so the situation of imbalance in the financial market as well as in the balance, according to the model of Modigliani and Miller.

3. The imbalance in the financial market

Suppose we hold following information about the enterprise "A" S. A. – without debts and the enterprise "B" S. A. – with debts (Table 1.): EBIT of the two firms will be the same, in the value of 100,000 Euros, the rates of return on equity which remunerated shareholders of both companies are: \( rf_A = 25\% \) and \( rf_B = 30\% \). Values of own funds\(^1\) of the two firms will be of 400,000 Euros for enterprise "A" and of 233,333 Euros for enterprise "B". Thus, the value of enterprise “B” with debts appears higher than that of the enterprise without debts "A". Being in the imbalance in the financial market, investors may achieve profits without risk, by the operations of arbitration.

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\(^{1}\) the value of own funds was calculated by updating the net profit to the rates which remunerated shareholders: 

\[ Pr_{net,j} \div rf_j, \text{ where } j = \{A,B\}, A, B \text{ representing the enterprises; } \]
Table 1. Financial information from enterprises "A" and "B"

<table>
<thead>
<tr>
<th></th>
<th>Enterprise „A”</th>
<th>Enterprise „B”</th>
</tr>
</thead>
<tbody>
<tr>
<td>EBIT</td>
<td>100.000</td>
<td>100.000</td>
</tr>
<tr>
<td>Interest expenses (15%)</td>
<td>0</td>
<td>30.000</td>
</tr>
<tr>
<td>Net profit(^{\text{e}})</td>
<td>100.000</td>
<td>70.000</td>
</tr>
<tr>
<td>Return on equity</td>
<td>25%</td>
<td>30%</td>
</tr>
<tr>
<td>The value of own funds</td>
<td>400.000</td>
<td>233.333</td>
</tr>
<tr>
<td>The value of debts</td>
<td>0</td>
<td>200.000</td>
</tr>
<tr>
<td>The value of enterprise</td>
<td>400.000</td>
<td>433.333</td>
</tr>
<tr>
<td>Debt rate(^{\text{f}})</td>
<td>0</td>
<td>85.71%</td>
</tr>
<tr>
<td>Return on assets</td>
<td>25%</td>
<td>23.08%</td>
</tr>
<tr>
<td>The cost of capital(^{\text{g}})</td>
<td>25%</td>
<td>23.08%</td>
</tr>
</tbody>
</table>

Further, we study the process of arbitration: suppose an investor who owns 2 percent of the shares of enterprise with debts "B". He will receive 2 percent of the net profit of 70,000 Euros, i.e. 1,400 Euros, if he retains the enterprises shares, and the profitability on its own funds that he invested is 30 percent\(^{\text{h}}\).

Suppose that the investor carried out following operations [1]:
- sold the shares of enterprise "B" with 4,667 Euros (\(2\% \times 233.333\) EUR);
- increase its debts with 4,000 Euros, at a rate of interest to 15 percent; the personal debts to the report with its own funds is identical to that of the enterprise "B" (85.71 percent). So the level of financial risk is the same;
- with the amount of 8,667 Euros buys 2.17 percent\(^{\text{i}}\) shares in the enterprise without debts (\(2.17\% \times 400.000\) EUR).

The revenue obtained by the operation of arbitration will be:
- 2.17% of net profit of the enterprise "A": 2,170 Euros;
- the interest of 15 percent regarding to the debt of 4,000 Euros: 600 Euros;
- the gain obtained by those operations will be of 1,570 Euros, compared with 1,400 Euros as it would be obtained if he would have kept shares of enterprise indebt.

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\(^{\text{e}}\) it took into account the assumptions of the initial model's Modigliani and Miller (including taxation absence), excluding of hypothesis regarding to the perfection of the financial markets;

\(^{\text{f}}\) debt rate calculated thus: \(\text{Debts} / \text{Own capitals}\);

\(^{\text{g}}\) actually represent the weighted average cost of capital (WACC), calculated thus:

\[
WACC_j = k_{CP} \times \frac{CP_j}{CP_j + D_j} + k_D \times \frac{D_j}{CP_j + D_j},
\]

where \(j = \{A, B\}\), \(CP\) represents the own capital, \(D\) represents the debts value, \(k_{CP}\) represents the cost of own capital and \(k_D\) represents the cost of debt, i.e. interest rate;

\(^{\text{h}}\) the vale resulting from the report: \(\frac{1.400}{2\% \times 233.333}\);

\(^{\text{i}}\) the percentage has been determined to: \(\frac{8.667}{400.000}\);
The return on equity is then 33.64 percent\(^{25}\) for the same level of financial risk. However, in this case the financial risk is borne directly by the investor, instead of being indirectly, through ownership of shares in enterprise "B".

4. The balance on financial market

We assume that investors sell shares of the enterprise "D" enterprise and buy shares of the enterprise "C", until we get to a tie in the value of the two enterprises [10]. Data on the two enterprises are listed in the table 2.

### Table 2. Financial data from enterprises "C" and "D"

<table>
<thead>
<tr>
<th></th>
<th>Enterprise „C”</th>
<th>Enterprise „D”</th>
</tr>
</thead>
<tbody>
<tr>
<td>EBIT</td>
<td>100.000</td>
<td>100.000</td>
</tr>
<tr>
<td>Interest expenses (15%)</td>
<td>0</td>
<td>45.000</td>
</tr>
<tr>
<td>Net profit</td>
<td>100.000</td>
<td>55.000</td>
</tr>
<tr>
<td>Return on equity</td>
<td>20%</td>
<td>27.5%</td>
</tr>
<tr>
<td>The value of own funds</td>
<td>500.000</td>
<td>200.000</td>
</tr>
<tr>
<td>The value of debts</td>
<td>0</td>
<td>300.000</td>
</tr>
<tr>
<td>The value of the enterprise</td>
<td>500.000</td>
<td>500.000</td>
</tr>
<tr>
<td>Debt rate</td>
<td>0</td>
<td>150%</td>
</tr>
<tr>
<td>Return on assets</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td>The cost of capital</td>
<td>20%</td>
<td>20%</td>
</tr>
</tbody>
</table>

If the investor achieves the same operations in arbitration [11], presented above, then:
- sell its shares to the enterprise "D" with 4,000 Euros (\(2\% \times 200.000\) Euros);
- increase its debts with 6,000 Euros, at an interest rate of 15 percent, the personal debts being the same with the enterprise "D" (150%);
- with the amount of 10,000 Euros buys 2 percent shares in the enterprise "C" (\(2\% \times 500.000\) EUR).

The gain of operation of arbitration will be in this case:
- 2% of net profit of enterprise "C": 2,000 Euros;
- the interest of 15 percent covering debt to 6,000 Euros: 900 Euros;
- revenue obtained from this operation will be of 1,100 Euros.

So, the investor get the same gain of 1,100 Euros, as in the case in which he would have kept the shares to enterprise "D" (\(2\% \times 55.000\) EUR).

But if we introduce a tax rate of the enterprise profit by 33.33 percent then net profit will be reduced from \(100.000 – 33,33\% \times 100.000 = 66.666,67\) Euros, what will cause an immediate reduction with \(33,333.33\) Euros in the market value of all enterprises financed by the capital.

\(^{25}\) the percentage has been determined to: \(\frac{1.570}{4.667}\)
and reserves, as the enterprise "A". This is just such a transfer of wealth from shareholders of the enterprise "A" to the state [8].

The model of Modigliani and Miller constituted topic of discussion in numerous articles and books of specialty, mainly because it’s restrictive premises. Thus, the critics of the Modigliani and Miller model refer to:

- the theoretical hypothesis to perfection markets, criticism claiming the imperfection on financial markets. This theory has a central role in the justification of the conclusions of Modigliani and Miller model, whereas the validation is conditioned on their intervention of the mechanism for arbitration, which involves a perfect substitutability between shares, possessing similar characteristics to the expected risk and profitability;
- the hypothesis of lack of any taxation, even the model authors considering necessary bringing corrections to the model conclusions in 1963;
- the hypothesis on steady of interest rates, over which the authors have returned to the corrections in 1963;
- the model does not carry any differentiation between the two types of debt – personal or one of the enterprise in which it owns a part of the capital – considered interchangeable perfectly but which, in fact, behave different risks and costs;
- the possibility of arbitration achieving is questioned and other costs which the authors model have not taken into account: the costs of bankruptcy, the agent, the signal, restrictions related to the institutional investors behaviour and the costs of trading.

In the 1963, incorporating the model demonstration in the presence of the profit tax, Modigliani and Miller shows that the financial structure influences the enterprise value (the value of an enterprises indebt being greater than that of an enterprise without debts), and increasing of the debt share in the capital structure would decrease the weighted average cost of capital, in the context of deduction of the interest by the taxable profit.

Also, the authors conclude that taking into account the profit tax get debts compared with the financing of own funds, because the interest costs are deducted from the taxable amount. This amount will be received by the enterprise creditors without being the subject of tax, but dividends are not deducted from the taxable basis, and the shareholders cashing only after paying the profit tax. Debts increase the return on equity, with double interpretation: on the one hand signal the increasing of the enterprise performance and, on the other hand, is constituting that a premise for increasing its own capital cost requested by shareholders of the enterprise indebt.

Modigliani and Miller demonstrates that the rate of return on equity for the enterprise indebt – increased by the profitability rate of the enterprise without debt – will be decisive of the return on equity for enterprise without debts, to that is added the effect of lever and taxation influence. The effect of lever occurs only if the rate of return on assets is higher than the interest rate before tax.

Related to the debt burden and fiscal impact on the value of weighted average cost of capital and enterprise value, the Modigliani and Miller conclusion was that, the financial structure is no longer neutral in the taxation hypothesis because the interest is deductible when calculating their taxable profits, the financial structure influences the enterprise value, and the debt making possible the increase of the enterprise value.

Demonstration starts from the review on realising of the net profit. Thus, for an enterprise without debts, the net profit is: $Pr_{net} = EBIT \times (1 - \tau)$, and for an enterprise indebt:
Pr\(_{net}\) = \((EBIT - r_d \times D)\times (1 - \tau)\). Updating the net profit on the basis of the return on assets for an enterprise in the class of risk \(i\), \((r_{ei} = r_f)\), to which the market capitalise the revenues expected after tax, the value of the enterprise without debts \((V_N)\) will be \(V_N = \frac{EBIT \times (1 - \tau)}{r_{ei}}\), and the enterprise indebts value \((V_L)\), obtained by updating flows of exploitation due to shareholders and creditors will be: \(V_L = \frac{(EBIT - r_d \times D)\times (1 - \tau)+ r_d \times D}{r_{ei}} + \frac{\tau \times r_d \times D}{k_d}\), where:
\[
\begin{align*}
\tau & = \text{the quota of tax profit;} \\
k_d & = \text{cost of no risk debts.}
\end{align*}
\]

Noting with \(B = \frac{r_d \times D}{k_d}\), the amount of indebt enterprise becomes: \(V_L = V_N + \tau \times B\). If \(\tau = 0\), then \(V_L = V_N\), so the enterprise value is independent from the type of financing used. If \(\tau > 0\), then the enterprise indebts value is greater than the value of the enterprise without debts, as a result of tax savings. It should be noted that the relationship above was assumed that the market value of debts is constant, without risk, and the enterprise has capacity to pay, so there is no risk of bankruptcy.

In the tax conditions, the increase of debt weighting in the capital structure would decrease the weighted average cost of capital, thus: \(WACC_L = r_{ei} \times \frac{CP}{CP + D} + r_d \times (1 - \tau) \times \frac{D}{CP + D}\). If \(\tau = 0\), then WACC is invariably to changes in the capital structure. If \(\tau > 0\), then WACC will drop by as much as debts are larger, but not below the cost of debts net of tax. Also, at a given level of debt burden, the reduction of WACC is more than the increase of the tax rate.

5. Conclusions

The decision for a specific structure of the enterprise capital must take into account of a series of risks associated with debt burden, risks that can offset or even cancel its positive effects. The identification and quantifying of these risks through risk primes represents a step very important in the estimations rates of updating the cash-flows generated by the enterprise. Thus, the best known risks are:

- **risk of obtaining losses**: the tax savings can be obtained only if the enterprise obtain an exploitation result superior of these expenses, i.e. the return to assets is higher than the interest rate on loans taken out. Also, once to the increase the debt is increased the risk that the exploitation profit to cover the high amount of interest expenses. In these conditions, the discount rate of tax savings will increase once with the degree of debt, including in its size the risk to obtain of loss;

- **the constraints of relations with third parties**: the excessive increase of the debt burden constitutes an alarm signal both to creditors, as well as business partners. A financial structure disrupted focused more on resources attracted from creditors, determined an increase of the enterprise risk.

- **the liquidity risk**: occurs when the financing policy was drawn up without coherent in the enterprise strategy and with the foreseeable future developments of the relations of current business and the lack of liquidity leading to cessation of payments situation;
The risk of bankruptcy: once with increasing of debt burden, increases and the risk of an enterprise to go into default. A transient crisis to the operational level or enterprise management is much more difficult to control in this case. In a certain degree of debt, the benefits from tax savings will be an increasing of costs associated with risk of bankruptcy.

Managers can guarantee a certain level of financial performance of the enterprise when granting credit, but it is possible that, in the future, their behaviour to amend and the creditors to record a loss in the value of their investment in the borrowed enterprise.

The creditors with experience will anticipate these risks and will adjust the level of interest rates required whereas the direct cost of bankruptcy diminishes the enterprise value and a large part of these costs are incurred, in the end, by creditors. This fact makes them to add a risk prime to the interest rates charged to sums borrowed by enterprise. Paying this risk prime, the shareholders pay, in fact, the costs of bankruptcy estimated, whenever issued risky debt. That's why they should consider this risk prime a cost that balance other benefits associated with financing through debt.

In practice are known several methods that could be reduced the costs associated to financing with debt: the financing through bank credit or loan issuance of bonds, contracts with managers on granting the compensation for eliminate the distortion trends of the enterprise investment scheme and agreements that specify the priority right of debt, the maximum amount that an enterprise can distribute as dividends in the form and/or a maximum limit for the sale of assets.

From the studies, resulted the following [7]: in Germany and Japan, changes in the estimation of the share value influence the risk structure in decisions of investment in a small measure, while in Canada and U.S., changes in shares evaluation have an important effect on the structure risk of the enterprise investment.

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