OPTIMAL CAPITAL STRUCTURE - OBJECTIVE OF THE FINANCING DECISION

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Abstract: *Precise determination of the proportions of different funding sources that define the optimal capital structure of a company as well as identifying the determinants of choice between various sources of funding to maximize firm value were subject, especially in the last five decades, of numerous works in corporate finance. Despite the wording of many theories that have tried to identify how firms funding decisions are based and to define the idea of financial structure optimality, a complete theory of companies financing options has not yet been delineated. This paper sheds light on the complexities of choosing optimal financial structure and shows an arbitration between possible financing structures to maximize enterprise value.*

Key words*: capital structure, value of company, weighted average cost of capital*

INTRODUCTION

For an investment project, a company can choose any of the sources or can combine them in various ways, but the question is which source or combination is the best for the maximisation of the company value, the ultimate goal. Consequently, the capital structure should be examined from the point of view of its impact on the company.

MATERIALS AND METHODS

The optimal capital structure for a company is represented by the combination of its equity and the borrowed capital which leads to maximizing the market price of shares of that enterprise. At the same time, the optimal financial structure represents the mixture of financing sources that determines a minimization of the weighted average cost of the company's equity.

In this respect, the capital structure can be interpreted in terms of target structure meant to balance the level of risk and the rate of return. The use of borrowed capital to a greater extent determines the increase in the level of risk of the company earnings, but a higher leverage ratio means, the same time, a rate of return estimated at a higher value. The higher level of risk associated with a higher leverage ratio tends to decrease the price of the shares in the market, while the estimation of a higher rate of return leads to the increase in this price and thus a balance is reached. Thus, the optimal capital structure is the one that reaches a balance between the risk level and the estimated rate of return and consequently maximizes the market price of the shares.

We should also take into account that the two main financing sources: equity and borrowed capital (debts) have certain characteristics according to which the optimal financial structure can be determined. On the one hand, equity capital provides investors with control over the company as owners. Anyway, the company cannot use only equity capital to finance itself, because the rational objective is to maximize its value. The cost of a capital increase will be higher than the cost of the existing one, and since the risk model for the capital is higher, the rates of return are higher, which will lead to the sale of capital at lower market prices. On the other hand, borrowed capital provides investors with a certain fixed profitability and the right to be the first to receive compensations in case of liquidation. The increase in the borrowed capital is also beneficial for the company in many cases. First of all, the interest expenses are deductible, which reduces the effective

borrowing cost. Secondly, creditors (those who own bonds) receive a fixed rate, and therefore, shareholders do not have to share the profits if the business is profitable.

The theoretic discussions concerning the financial structure of the company are presented in the financial theory in the form of three main approaches: the traditional concept, the Miller-Modigliani approach and set of more recent theories considered to form the so-called modern approach.

According to the traditional model, debt has a lower cost than own funds because it is less risky. Consequently, a moderate increase in debt can reduce the weighted average cost of capital. The traditional model is based on the following findings: The rate of return requested by shareholders grows with the leverage ratio because there is an increase in the financial risk. The cost of financing the debt remains stable up to a certain level of indebtedness, beyond which the rate of return requested by creditors grows as a result of the risks undertaken through indebtedness. According to this theory, the weighted average cost of capital decreases to a certain point, and then it grows with the leverage. The optimal capital structure will be in the minimum point of the weighted average cost of capital. This traditional model does not take into account taxation and ignores the savings from taxation that can be achieved due to indebtedness.

Unlike the traditional theory, the Modigliani - Miller approach represents a construction based on certain hypotheses characterising an ideal situation, far from being proved in reality. The initial model developed in 1958 reached the conclusion of the neutrality of the financing policy towards the value of the enterprise and the weighted average cost of capital, its value being given only by level and the risk of the future cash flows.

In the survey published in 1963 Modigliani and Miller conclude that taking into account the profit tax favours indebtedness in relation to the financing from own funds, because interest expenses are deductible. This amount will be received by the creditors of the enterprise without being subject to taxation, while dividends are not deducted from the taxable base and shareholders collect them only after paying the profit tax. The indebted company value grows with its, being equal to the value of the unlevered company and with the present value (at infinity) of the tax savings.

From the current theories concerning capital structure, the trade-off theory holds that company can increase its leverage up to the point where the value of the additional tax gain, determined by the deductible nature of the interests paid, compensates the costs associated to financial distress or to bankruptcy. Bankruptcy costs include direct costs, i.e. administrative costs of the establishment of a supervisory board, costs related to the legal prosecution, and other direct costs incurred due the company's bankruptcy or reorganization. These costs are relatively small compared to the market value of the company. On the other hand, indirect costs can be significant, and can influence both the cost of debt as well as the cost of equity. When creditors perceive the increase in the probability of financial loss, they request a larger income for the capitals they immobilized, and they will request an insolvency risk premium. Shareholders also have the same concern, because, if the financial loss becomes quite acute, the company will head towards bankruptcy, thus the costs requested by them will also lead to a reduction of the company value.

This theory admits that the debt ratio can vary from company to company. Companies that have safe tangible assets and high taxable incomes that generate significant tax savings should have a high leverage.

Small profitable enterprises that have a high share of risky intangible assets should be financed entirely from equity.

Unlike the Modigliani-Miller theory that seemed to encourage enterprises to borrow as much as possible, the trade-off theory eliminates extreme measures and justifies the existence of moderate leverage ratios.

This theory explains very well the structural capital differences among sectors, but it does not understand why the most profitable companies within the same sector have more traditional capital structures (according to the trade-off theory, a high profitability should mean a higher debt capacity and a strong tax incentive).

The pecking order theory or the competitive theory, shows that companies resort, first of all, to internal financing by reinvesting profit if they have the necessary funds, and when they have to resort to external financing, they will prefer borrowed sources to the detriment of own ones (attracted by the issue of new shares).

This explains why less profitable companies within a sector borrow more than others: because they need external financing more, and leverage, when the internal resources are exhausted, comes right after them in the hierarchy of the financing methods.

The hierarchy of the financing methods is a consequence of the information asymmetry explained by the signalling theory. Managers know more about their business than external investors and hesitate to issue shares if they consider that their price is too low (underestimated). The issue of new actions will take place when their price is correct or they are overestimated. Investors know this too and are when new shares are issued.

The signalling theory states that the level of debt is interpreted by creditors as a performance signal, because a good enterprise is a company that has debts and has the capacity to repay each debt at maturity, otherwise, it would go bankrupt.

Thus, by contracting a loan, the manager sends a credibility message to the potential and active investors. The indebtedness increase should be perceived, on the one hand, as a bankruptcy risk increase factor, and on the other hand, as a signal indicating that the company has higher performance. According to this approach, indebtedness is positively correlated to the company value [7], [6], [5] and with the probability of bankruptcy [7]. Consequently, the financial structure can be a method of identifying the quality of the companies operating in the market and of classifying them based on their performance level.

The theories described above are based on the assumption that the interests of company financial managers and of shareholders are perfectly aligned and that financing decisions are always made in the best interest of the current shareholders. Nevertheless, Jensen and Meckling (1976) argued that these hypotheses are implausible from the theoretical point of view and impossible to test empirically. Analysing the company as a heterogeneous set of interests, they identified two types of conflicts: between shareholders and managers, and between shareholders and creditors, the source of conflicts being, in fact, the separation between property and control [2].

Authors held that between the managers and the shareholders there is a principal-agent relationship, according to which the managers, as main agents of the shareholders, have to work in the latter's interest. However, managers don't always act in the shareholders' interest, and pursue certain benefits such as: higher wages than the ones in the market, additional earnings, the security of their jobs and, in extreme cases, attracting assets or cash flows. Shareholders could discourage such value transfers by various monitoring and control mechanisms, including by supervising managers. Due to the fact that such mechanisms are costly and determine a decrease in the earnings of the company, the perfect monitoring of the managers remains an unachievable goal. Jensen and Meckling (1976) defined manager monitoring costs, costs related to the agent's obligations (bonding costs) and to the residual loss as agency costs. These agency costs actually

generated by conflicts of interests emerged at company level determine the company's equity structure and are explained by the agency theory.

The increase in the level of debt determines the emergence of the agency cost between shareholders and creditors: the increase in the level of debt leads to the shareholders' motivation to compel managers to complete risky projects. Only shareholders benefit from their favourable completion, while their unfavourable completion is mainly borne by creditors.

A more recent capital structure theory is the theory of the synchronisation with the market. The phrase synchronisation with the market, used in company finance, refers to the practice of companies to issue shares at a high price and to repurchase them at a low price. Due to the fact that the current shareholders are those who benefit from this practice at the expense of the new shareholders, managers have to synchronise the company financing to the market when they pursue the interests of the old shareholders [1]. In this context, Baker and Wurgler (2002) studied the determinants of the capital structure and the extent to which the synchronisation with the market influences the companies' capital structure. The authors used the market value/book value ratio to assess the opportunities of synchronisation to the market and concluded that unlevered companies are those who issue shares when such shares are evaluated by markets at high values. In other words, companies' tendency to issue more shares than loans when the market value of their shares is high has a durable influence on capital structure. Indebted companies are those who issue shares when such shares are evaluated in the market at a low price.

RESEARCH RESULTS

We showed below the various approaches of capital structure by a simulation, taking into account the profit tax and the cost of financial distress by including an insolvency risk premium in the cost of equity and debt.

We are considering a company that has invested 800,000 RON in installations, machinery and working capital. The investment generates annual earnings before interest and taxes (EBIT) amounting to 15,000 RON perpetually.

The annual depreciation is equal to the value of new investments, and the company distributes all its earnings as dividends. If the profit tax rate (t) is 16%, the free cash flow (FCF) is EBIT (1-t) namely 126,000 RON perpetually.

The calculations are based on the hypothesis that, initially, the company does not have debts and has a number of 5,000 outstanding shares, and in order to reach a certain leverage, the company issues debts and redeems shares with the proceeds from the debt issue.

The sequence of events is assumed to be the following:

- the company announces its intention to change its equity structure in the long term and the debt aspects
- the change in the price of shares, in order to reflect the new company value, and
- the company redeems shares at the new price.

In order to find the number of outstanding shares after redemption (NA):

- We first calculate the new share price after debt (P): $P = (E + D) / 5000$;
- Then we determine the number of shares that can be redeemed with the borrowed amount (n): $n=D/P$;
- NA will be obtained as a difference between the number of shares before debt and the number of shares that can be redeemed: $NA= 5000 – n$.

The profitability required by the shareholders or the equity cost (Ke) is correlated to the level of risk-free rate of return (Rr the interest rate for a risk-free asset, more

specifically, government bonds) to which it adds a company-specific risk premium, weighted by ß which represents the measure of risk in the market.

The assessment of the equity cost (as a calculation item for the weighted average cost of capital WACC) uses the calculation model of the profitability of an asset in the capital market (CAPM).

$$\text{Cost of Equity} = \text{Risk-free Rate} + ß * \text{Risk Premium}$$

The estimated value of the free-risk assets is 4% and represents the current market expectations.

The evaluation of the level of ß is made based on the comparison with similar companies in the sector, listed on the capital market.

As the leverage increases, creditors as well are exposed to a higher risk too.

The estimation of the debt cost (Kd) starts from the estimation of the interest for a risk-free asset to which a margin is added for the risk of default to which creditors are exposed:

$$\text{Cost Debt} = \text{Risk-free Rate} + \text{Default Spread}$$

and after tax

$$\text{Cost Debt} = (\text{Risk-free Rate} + \text{Default Spread})*(1-t)$$

Weighted average cost of the company's equity after tax represents the average of the costs specific to the financing sources of the company and can be viewed as an opportunity cost of the company's financing its investments. The notion of capital cost and that of opportunity cost recommend the use of market values.

$$WACC = Kequity * E/V + Kd * D *(1-t)/V$$

For the calculation of the market values, we used the method of discounting on an infinite horizon of time (the continuous obligations model).

The debt market value (D) is equal to the payments of annual interests divided to the yield required on debt (Interest / Kd).

Moreover, the market value of the equity (E) is equal to the dividends, divided to the yield expected for the equity (Dividends / Ke).

The market value of the entire company (V) is the sum of the market value of its debts and the market value of its equity.

The company market value, taking into account the perpetual nature of the cash flows, can also be determined by dividing the free cash flow (FCF) to the weighted average cost of the company's equity (WACC) used as discount rate.

As we can see from Table no. 1, the total company value (V) is higher than the value of the unlevered company and grows as the debt level grows up to a certain point, beyond which the risks associated to indebtedness, quantified using the risk premiums, can diminish or annul its positive effects.

By indebtedness, the company obtains tax savings by deducting the interest paid to creditors from the operating profit. Thus, for the same earnings before interest and taxes, the tax paid to the government (T) is inversely proportional to the increase in the debt, and the cash flow that remunerates the shareholders and the creditors (Interest & Dividends) is higher.

In the case of the simulation presented above, 40% is the optimal indebtedness level, because the company value reaches its peak value. At this level, WACC is minimal. At this level of indebtedness, the share price is also maximum. Thus,

- the maximal company value Vmax = 1,538,256 RON
- the minimal weighted average cost of capital WACC = 8.19%

– the maximal share price Pmax = 308 RON.

Tabel 1.

Variation of financial indicators depending on the company indebtedness

Book value debt ratio	0,00	0,10	0,20	0,30	0,40	0,50	0,60	0,70	0,80	0,90
Book value of the firm	800000	800000	800000	800000	800000	800000	800000	800000	800000	800000
Book value of debt	0	80000	160000	240000	320000	400000	480000	560000	640000	720000
Book value of equity	800000	720000	640000	560000	480000	400000	320000	240000	160000	80000
Earnings before taxes and interest (EBIT)	150000	150000	150000	150000	150000	150000	150000	150000	150000	150000
Interest	0	3480	7030	10650	14342	24000	28800	44800	64000	77040
Profit before taxes (PBT)	150000	146520	142970	139350	135658	126000	121200	105200	86000	72960
Taxes (16%) (T)	24000	23443	22875	22296	21705	20160	19392	16832	13760	11674
Profit after taxes (PAT)	126000	123077	120095	117054	113953	105840	101808	88368	72240	61286
Dividends	126000	123077	120095	117054	113953	105840	101808	88368	72240	61286
Interest + Dividends	126000	126557	127125	127704	128295	129840	130608	133168	136240	138326
Cost of debt (Kd)	0,0435	0,0435	0,0439	0,0444	0,0448	0,0600	0,0600	0,0800	0,1000	0,1070
Cost of Equity (Ke= Rr + ß * Risk Premium)	0,0914	0,0920	0,0925	0,0930	0,0935	0,1042	0,1235	0,1653	0,2530	0,4234
Market value of debt (D)	0	80000	160000	240000	320000	400000	480000	560000	640000	720000
Market value of equity (E)	1377822	1338327	1298567	1258543	1218256	1015298	824231	534662	285564	144765
Market value of firm (V)	1377822	1418327	1458567	1498543	1538256	1415298	1304231	1094662	925564	864765
Return on equity (Ke = PAT /E)	0,0914	0,0920	0,0925	0,0930	0,0935	0,1042	0,1235	0,1653	0,2530	0,4234
Number of shares outstanding (NA)	5000	4718	4452	4199	3960	3587	3160	2442	1543	837
Price per share (P)	276	284	292	300	308	283	261	219	185	173
Earnings per share (EPS)	25,20	26,09	26,98	27,88	28,78	29,51	32,22	36,18	46,83	73,22
Riskfree rate (Rr)	0,0400	0,0400	0,0400	0,0400	0,0400	0,0400	0,0400	0,0400	0,0400	0,0400
Measures market risk (ß)	1,0674	1,0781	1,0889	1,0997	1,1107	1,3329	1,7328	2,5991	4,4185	7,953
Market premium	0,0482	0,0482	0,0482	0,0482	0,0482	0,0482	0,0482	0,0482	0,0482	0,0482
Weighted average cost of capital after taxes (WACC)	0,0914	0,0888	0,0864	0,0841	0,0819	0,0890	0,0966	0,1151	0,1361	0,1457
Free cash flow FCF=EBIT*(1-t)	126000	126000	126000	126000	126000	126000	126000	126000	126000	126000
Market value of firm (V = FCF/WACC)	1377822	1418327	1458567	1498543	1538256	1415298	1304231	1094662	925564	864765

Source:Ccalculations and values proposed by the author

CONCLUSIONS

After the emergence of Modigliani and Miller's capital-structure irrelevance theory (1958), the research in this field aimed at developing theories and models whose main assumption is that, only if the existence of taxes, bankruptcy costs and information asymmetry are taken into account, capital structure is relevant for the company value.

A generally applicable theory of the optimal capital structure is not possible due to the multitude and complexity of factors that explain how companies are financed.

In the absence of bankruptcy costs, the profitability requested by shareholders grows linearly with indebtedness, as held by Modigliani and Miller in the study published in 1963. With the increase in the level of debt, the probability of default grows too, and the financial profitability is expected to grow faster than in the absence of bankruptcy costs beyond a certain point. In the beginning, there will be a low probability of default, and no penalties will be requested. If the indebtedness grows, investors will penalise the price of the shares of the indebted company.

The company must always take into account the financial theory when it makes a financing decision, because:

- an insufficient debt ratio in the capitals puts the company in a position where it does not benefit from financial resources cheaper than its equity, especially after tax;
- an excess debt increases the share risk, but also the cost of debts and of equity;
- there is an optimal financial structure between these contradictory factors.

The optimal capital structure will be determined in such a way as to ensure the maximization of the positive effects of indebtedness while minimizing associated risks.

The fiscal advantage is overtaken by the bankruptcy costs and the increase in the borrowing costs, as soon as the level of debt exceeds the optimal one, which, in real life, do not represent a fixed point, they would rather be indicated within a range.

This will vary from industry to industry and will depend, to a certain extent on the investment risk of that company. The interest of the company is to reach the optimum as soon as possible in order to increase its value. Between one optimized financial structure and another one, the difference between market capitalizations can be significant.

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