Optimizing of the Capital Structure of the Concrete Firm in the Theory and Practice of the Temporary Corporate Finance

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Abstract: - The aim of this article is to analyze the theoretical and practical problems concerning optimizing of the capital structure of the concrete firm and to answer the question if it is possible to prepare the recommended process for this optimizing. The most important problem in a theoretical way is to identify the theory which best fit. The firm has to decide firstly if to start the process of active optimizing or if it is satisfied with the following of branch standards or it is satisfied with complying with the pecking order theory. In case of active optimizing process firm could use theories stipulating the concrete empirical value, the traditional theory and the theory of spouses Neumaiers’. In case of using the traditional theory it is necessary to cope with the problems of identifying the cost of equity and debt in dependency on the indebtedness. The optimal capital structure is not possible to identify, but only to estimate because of the different approaches to the solution of the application problems of single theories. The optimal capital structure will also vary because of the subjective approach to the process of optimizing. Nevertheless the wider manual how to cope with the process of the optimizing of the capital structure of the concrete firm is possible to prepare.

Key-Words: Capital structure; Optimizing; Firms; Theories; Application; Instructions;

1 Introduction
Optimizing of the capital structure of the concrete firm represents eternal topic inviting for the very large discussion and the very large researches which plays a very important role in the sphere of the financial management. The way of financing of the concrete firm could very strongly influence its prosperity and the fulfilment of the key target of the financial management of the concrete firm, maximizing of its market value. Although this influence is not so important, as for example the right investment decision or the restructuring of the firm, it is necessary to dedicate the attention to this problem. The optimizing of the capital structure of the concrete firm is also important because the discounting rate for the process of discounting of the future cash flow of investments or the free cash flows in case of income valuation of firms is often derived from the value of the average weighted costs of capital of the firm. It is supposed the same risk and the same capital structure as in existing business. The weighted costs of capital are also important in case of the identification of the optimal amount of business capital where this figure is compared with internal rate of return of accepting projects. If the weighted cost of capital are underestimated, the bad projects could be accepted and vice versa. There is no doubt that the optimizing of the capital structure of the concrete firm plays a very important role. But it is necessary to consider if there is some theoretical potential for doing optimizing in some concrete firm and if this potential is possible to apply in practice. The aim of this contribution is to analyze if it possible to identify some theoretical manual for optimizing of the capital structure of the concrete firm and if this manual would be applicable without great problems in practice by overcoming the application problems which could emerge. It is possible to express the hypothesis that it is not possible to identify the right unique procedure of optimizing of the capital structure of the concrete firm including the determination of the optimal indebtedness because of the different theoretical approaches and because of the only very difficult surmountable application problems. Even if the hypothesis would be proved, the acquired knowledge would be summarized into some recommended manual how to cope with the process of optimizing of the capital structure of the concrete firm including the recommendations how to overcome the application problems. The basic method used will be the evaluative description and
the analysis with the use of theoretical and practical knowledge. Concrete findings could be then summarized by the synthesis into relevant conclusions including the recommended procedure.

2 Single Theories in Practice
There it is a few theories concerning the process of optimizing of the capital structure of the concrete firm. Because the most theories are very good analysed in professional literature it could be useful to present only the concise survey of selective theories for the purpose of the identification of their usage in the practical process of valuation. There are mainly the following theories:

1. Traditional Theory.
2. Pecking Order Theory.
5. Brealey and Myers Theory About Four Dimensions of Capital Structure.

Traditional theory is based on the average costs of capital and considers as the optimal capital structure the point where the weighted average costs of capital are on a minimum level. This point is possible to fall in with the maximum value of the firm assuming the stable expected incomes [10]. This assumption is derived from the basic economic theory which states that the market value of some economic subject equals the present value of the future incomes which are expected.

The pecking order theory is not the right theory, but rather the result of the empirical research of the behaviour of the firms mainly in the USA. It was find out that more 80 % of the firms in the USA [10] are using firstly internal finance and then external finance, mainly debt and then the capital acquired by issuing the new shares. This approach is very easy, but not low-cost. It could be discussed if this approach is the result of the comfort or the wisdom of managers because if the firm is trying to acquire external capital it must prove in a very complicated way a good financial health of the firm and the attractiveness for the potential investors.

Modigliani and Miller published two propositions. The first states that the market value of the firm does not depend on the structure of the capital. According to the approach the process of the optimizing of the capital structure of the concrete firm does not have matter. It was supposed in a simplified way the tax free environment and the perfect capital markets. In a second proposition the existence of taxes was admitted and the maximum debt was recommended. But the existence of the financial distress costs wasn’t considered. Despite some inconsistence this theory is still alive and the extensive discussions mainly in connection with 50.anniversary of this theory are held.

Compromising theory identifies the point of the optimal capital structure as the result of the equalizing of the effect of the interest tax shield and the cost of financial distress. Also the stability of the firm’s profit and the role of long-term assets is emphasised. It is recommended that the higher indebtedness is useful for the firms with the stable expected profit and with the higher share of tangible long-term assets.

Brealey and Myers theory about four dimensions of the capital structure takes into consideration the following dimensions [1]:

1. Taxes.
2. Risk.
3. Asset Type.
4. Financial Slack.

The theory of Spouses Neumaiers’ is a special theory published in the Czech Republic [9] which states that the optimal indebtedness is in the point where the profitability of equity is the highest. This point is possible to identify with the point of the maximum market value of the firm. The model is based on the earnings before interests and taxes (EBIT) and was identified in a following way (1):

\[ y = \frac{a}{x^2} \times \left[ x^2 \times g'(x) - b - (x \times g'(x) - g(x)) \times (1 - d) \right] \]

where \( y = \) net profit/equity, 
\( x = \) equity/assets, 
\( a = \) net profit/EBIT, 
\( b = \) EBIT/assets, 
\( d = \) not interest’s liabilities/assets, 
\( g(x) = \) interets/credits as a function of indebtedness.

The identification of the optimal indebtedness is than derived by computation of the first derivation of above mentioned function and its comparison with zero (2):

\[ [x^2 \times g'(x) - b - (x \times g'(x) - g(x)) \times (1 - d)] = 0 \]

The authors of this theory [9] become aware of some limitations of this model mainly because the ratio EBIT/assets and other invariables can change in time and because the influence of so called operation lever was neglect.
3 Determinants of Capital Structure and Branch Standards

Besides the different theories so called branch standards and the determinants of the capital structure play an important role. Every theory takes into account the different determinants. The most important determinants are the following [6]:

- Profitability and stability of the firm.
- Structure of assets of the firm.
- Branch of business.
- Management of the firm and its risk policy.
- Structure of the ownership and the control over the firm.
- Financial Slack.
- The amount of investments.
- The firm’s size.
- Good name and history of the firm.
- Requirements of the rating agencies.
- Legislation.
- Economy policy and economic cycle.

It is beyond all disputes that the individual determinants penetrate in higher or lesser extension into the single theories. The very important role plays mainly so called branch standards which very strongly influence the process of optimizing of the capital structure of the concrete firm.

4 Theoretical Analysis of Optimizing of Capital Structure

Optimizing of the capital structure is beyond all disputes the possible thing in a theoretical level, but not at all by the only way generally accepted, but only on the basis of the choice among different approaches and possibilities. Firstly it is necessary to realize if does the debt policy matter, or if it is better to be satisfied with the first proposition of the Modigliani-Miller theory. In the latter the process of the optimizing is finished. Then it is necessary to identify if it is better to respect the average cost of capital or to respect the pecking order theory and to use firstly the internal finance. The pecking order theory could be recommended for the small and medium firms where the process of calculation of average cost of capital could be considered as useless.

The other problem of optimizing of the capital structure of the concrete firm in a theoretical way is to consider the calculation of the concrete amount of the indebtedness of the firm. In this case it is possible to eliminate some theories which don’t offer the possibility of this calculation, for example the theory of Brealey and Myers about four dimension of the capital structure or compromising theory. So there are three theories available, the traditional theory, the theory of spouses Neumaiers and the pecking order theory. In case of pecking order theory the optimal indebtedness emerges from the process of gradual financing. In case of traditional theory it is necessary to calculate the cost of equity and the cost of debt. In case of the theory of spouses Neumaiers’ is necessary to identify the point of maximum profitability of equity. The choice of the theory which best fit, could depend also on the intricacy of the application of different theories in practice. The theoretical possibilities of optimizing of the capital structure of the concrete firm could be summarized into the following points of the recommended procedure [2]:

1. The decision concerning the signification of optimizing. In case of negative answer - using of the first proposition of Modigliani and Miller’s theory.
2. In case of positive decision - the choice between the pecking order theory and the calculation of the concrete amount of indebtedness. In case of choosing the pecking order theory the optimal indebtedness emerges from the chosen way of financing.
3. The decision about using theories enabling the explicit identification of the optimal indebtedness.
4. The choice of the relevant theory of optimizing in dependency on its feasibility in practice.

5 Practical Optimizing of the Capital Structure of the Concrete Firm

5.1 Practical Results of Optimizing of the Capital Structure of the Concrete Firm

Before the practical analysis of the possibility of optimizing of the capital structure of the concrete firm started, it would be useful to mention some practical knowledge from empirical researches in Czech Republic and abroad. As was mentioned in previous text about more than 80 % of firms, mainly in the USA, use firstly the internal financing and then external financial with the priority of debt to equity [10]. Some results of practical research in the Czech Republic [3,4] present that more than one
half of firms (55.6 %) pursue the active optimizing of their capital structure where they consider mainly the cost of capital, but they don’t pay attention to the long-term optimizing. Only 20 % of the firms pay attention to the long-term optimizing of the capital structure, where these firms are trying to minimize the debt and maximizing of the profit. More than 20 % of the firms do not consider their capital structure. The firms know only the traditional theory or pecking order theory. The other theories are unknown. The reason of this situation could be in underestimation of the importance of the process of optimizing of the capital structure of the concrete firm.

5.2 Application Problems of Chosen Theories

The usage of the different theories will very strongly depend on the ability of these theories to cope with the application problems which arise in the process of optimizing in the concrete firm.

The traditional theory is based on the minimum of the average cost of capital. For the identification of the point of minimum for different options, it is necessary to identify the average cost of capital for the different levels of indebtedness. It is evident that the cost of equity and debt will grow. But is this growth linear, parabolic or irregular? This application problem very strongly limits the usage of this in other respects very good theory. The very important tool for the solution of this problem could be so called fictional analysis and evaluation of financial health of the firm according to the methods using in banking and financial sector for the evaluation of the solvency of the client. The costs of the credit are usually adjusted just according to this procedure. According to the authors view if the size of indebtedness of the firm does not endanger its financial health, the cost of capital will grow very slowly in a linear way. The great change could happen if the indebtedness will be so high that it could threaten the financial health of the firm.

In case of using CAPM for identifying of the equity cost, also the calculation of β coefficient will be important. There it is possible to use the procedure for deriving indebted β from β of the firm with no indebtedness. The other possibilities concerning the identification of the coefficient β are stated in the professional literature [8]. Some solutions also offer the other publications [5] which come out from so called the contemporary indebtedness and the maximum possible indebtedness. The maximum indebtedness is defined as the indebtedness on a maximum level unless the results of the financial analysis of the firm evince some financial problems. Then it is supposed that in the range of the contemporary indebtedness and the maximum possible indebtedness the cost of equity and the cost of debt will grow slowly to the usually required value of 6 % over the inflation in case of equity and of 3 % in case of debt [5]. But would be the shape of curve between contemporary and maximum possible indebtedness parabolic or linear? Hrdý [5] recommended the parabolic shape on the basis of the function y = x²/k + a, where k and a are the invariables which are possible to identify by applying the values of x and y for the contemporary indebtedness and for maximum possible indebtedness. But according to the temporary authors’ view the linear shape could be more rational because there is no fundamental and justifying reason for the parabolic shape. But the problem than could emerge if there is some possible hint of the financial distress. Than the cost of equity or the cost of debt grow in an unforeseeable direction. It is possible to sum up that the point of the optimum indebtedness is possible to identify without problems only if the firm is in a zone of prosperity.

In case of the application of the theory of spouses Neumaiers it is necessary to cope with the problem of the identification of the size of interests in dependency on the indebtedness or vice versa with the problem of the identification of the proportion of equity and assets. It is the problem of the identification of the function g(x). There it is possible to recommend to use the function y = k/x [5] where the invariable k is possible to identify on the basis of the values of x and y for the temporary indebtedness.

The analysis of the practical use of the compromising theory depends on the ability of the identification of the present value of the interest tax shield and the cost of the financial distress. There is no problem concerning the present value of the interest tax shield, but the great problem with the identification of the cost of the financial distress exists. The financial theory [7] recommends calculate the cost of the financial distress on the basis of the fictitious insurance paid against the bankruptcy of the firm. The question is how to identify the insurance amounts. The identification of the negative cash flow of the firm for the different amount of the indebtedness is one possibility offered by the authors. It is supposed that the insurance agency covers this negative cash flow. This negative cash flow could be than increased by the commission of the insurance agency and this value could be compared with the present value of the interest tax shield. These calculations are considered as a very complicated because a very
good knowledge of the concrete methods of the insurance agencies concerning the identification of the insurance payments is necessary. Moreover the calculations would be done not in the sphere of the prosperity of the firm, but in the so called grey sphere where the identification of the future development is very complicated. For that reason the using of this theory in the practice is not recommended.

The pecking order theory doesn’t hide any application problems because the firm’s managers act according to the clearly defined procedure. If the internal financing is covered, they use the debt and finally could acquire external finance by issuing new shares.

The theory of Brealey and Myers about four dimensions of the capital structure doesn’t offer the possibility of the explicit identification of the optimal indebtedness. But it can be used also in practice, mainly if there are different results by using the Traditional theory and the Theory of spouses Neumaiers. According to these four dimensions (profit, risk, assets and financial slack) the firm can choose the higher or lesser value.

5.3 The Practical Optimizing and the Recommended Procedure of Optimizing

The first question deals with the problem if to do the process of optimizing or not. If the answer is negative, the firm has one possibility not yet deeply analyzed in this contribution, which represent the so called branch standards. The branch standards state usually indebtedness in the single branches. This indebtedness don’t need to be optimal, but in case the firm differs from this amount very strongly, it could be suspicious. And this could cause the incredulity of the potential investors. So the solution for the firm could be the simple acceptance of these branch standards.

It the firm decide to carry out the process of optimizing of the capital structure, it must decide if to be satisfied with the pecking order theory or if to identify some concrete optimal indebtedness. In another case the firm must decide between the traditional theory and the theory of spouses Neumaiers. Because the application problems of both theories are approximately the same, it could be proposed to use both theories which enable to create some range where it is possible to find the optimal indebtedness. For the final decision it is possible to use above mentioned four dimensions of Brealey and Myers theory or to do the final adjustment according to the branch standards.

In connection with the practical procedure of optimizing of the capital structure of the concrete firm is necessary to take into account the practical results of some above mentioned researches. The knowledge of the theoretical approaches is among managers on a very poor level which limits the possibilities of optimizing. Also some bad habit occurs among firm’s managers when the firm without debt is consider as a good firm and this situation is very often regarded as a proof of the prosperity and good name of the firm. But just the rich and successful firms could contemplate taking the debt into capital structure because of the possibility of the use of the interest tax shield and because of the reduction of the costs of firm’s capital. It is also a great challenge for universities and firm’s theorists to present their knowledge in the form of different articles or the training courses.

6 Conclusion

The aim of this contribution was to analyze if it possible to identify some theoretical manual for optimizing the capital structure of the concrete firm and if this manual would be applicable without great problems in practice by overcoming the application problems which could emerged. The hypothesis that it is not possible to identify the right unique procedure of optimizing of the capital structure of the concrete firm including the determination of the optimal indebtedness was expressed. It was proved that the identification of the unequivocal manual for optimizing of the capital structure isn’t possible and the hypothesis was confirmed. Even if the unequivocal manual is not possible to identify because of the different approaches in the theory and because of the very complicated application problems, it is possible to identify some manual in a broader sense where some recommendations for the firm’s managers could be offered. This manual can be prepared in the form of the decision tree where they are offered some possible options in dependency on the subjective manager’s ideas concerning the process of the optimizing of the capital structure. The single theories offer the passive or active approach to the process of optimizing. If the traditional theory is chosen it is necessary to cope with the problem of identification of the cost of equity and the cost of debt in dependency of the amount of indebtedness. This problem is essential and very strongly limits the use of this in a different way very good theory. One solution offered by the authors is to carry out the financial analysis of the firm and to assess the
credibility of the firm for the different size of indebtedness as it is usually used in banking sector. The other possibility is to identify the linear function \( y = k \times x + a \) (3) for the cost of equity and the cost of debt in dependency of the size of the indebtedness. The invariables \( k \) and \( a \) are identified for the temporary indebtedness and for so called maximum indebtedness. In case of the identification of the cost of equity it is possible to use CAPM where the coefficient \( \beta \) can be derived from \( \beta \) of the company without debt by calculation so called indebted \( \beta \). These recommended steps could be summarized in the following points:

1. The decision if to deal with the optimization of the capital structure or not.
2. The use of Modigliani Miller proposition I in case of negative answer to the first point. The process of optimizing is finished.
3. The use of the pecking order theory, branch standards or the active approach to the process of optimizing in case of the positive answer to the first point.
4. The indebtedness adjusted according to the branch standards – the process of optimizing finished.
5. The use of the pecking order theory with the preference of internal finance – the process of optimizing finished.
6. The decision of the usage of the traditional theory and the theory of spouses Neumaiers or the decision to use both theories.
7. In case of choice of the traditional theory - the determination of the method of the identification of the costs of equity and the costs of debt in dependency on the level of indebtedness. The process of optimizing is finished.
8. In case of choice of the theory of spouses Neumaiers - the identification of the function \( g(x) \) for different levels of indebtedness. The process of optimizing is finished.
9. In case of using both theories mentioned in the point 6 - the decision of the identification of the optimal indebtedness with the use of four dimensions of Brealey and Myers theory and the branch standards.
10. The choice of the lesser value – the process of optimizing finished.
11. The choice of the higher value – the process of optimizing finished.

The above mentioned options are fully available for the firm’s managers and their choice. There is no recommendations which way is the best, otherwise it could be recommended to deal with the process of optimizing because it is one of the most important long-term financial decision processes. It is possible to recommend for the smaller firms to choose the passive way of optimizing and to use the pecking order theory because the process of obtaining of external finance could be very complicated and expensive for these firms. On the other hand in case of larger companies the active way of optimizing including the identification of the concrete optimal indebtedness is recommended only with the exception of the firms where the indebtedness is done by the decision of the mother company on a multinational or holding base. This article was prepared in the frame of the institutional support of the Faculty of Finance and Accounting University of Economics Prague IP 100040.

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