

Company Value and a Capital Structure

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Abstract

In the article the process of planning of capital structure optimisation has been presented. For the process, the gradient in the area of search of tools which stimulate the financial decision-making or which create the optimal capital structure has been determined. The capital structure has been found a fundamental determinant for maximizing the value of a company.

Keywords: capital structure, company value, rules for financing

JEL Classifications: E22, G32

Introduction

The issues of capital structure in business belong to very important decision-making processes, since they significantly influence their financial situation both in a short and a long term. While making decision in this area, the business management must consider several factors, especially cost of capital, risk to the business activity and efficiency of use of the invested capital.

The importance of the problem is proved in the series of articles by Nobel Prize winners Franco Modigliani and Merton H. Miller which sparked the discussion on the consequences of financial management and the business unit's (or investment project) value which result from the assumed capital structure (Modigliani, 1958, 1963).

The essence of the capital structure analysed by the abovementioned authors comes down to the question of whether and how the company value or investment project value will change while maintaining its operation activity at the invariable level when the capital structure is modified. In other words, whether the financial managers are able to improve the company value by their decisions on relations between different forms of financing the company's business activity (Gajdka and Walińska, 1998, t. II, p. 171).

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The structure and the cost of capital significantly influence the company value. Maximizing of the company value is mainly the area of interest of their owners i.e. shareholders. This also means an important criterion for business management. In the management process the optimisation of the relation between capital structure and a company value is a very significant issue.

The aim of this paper is to develop a concept of optimisation of a capital structure related to the company value. Realization of the main objective had required consideration of issues connected with: fundamental problems of company value and its determinants (capital structure); this enabled to highlight possible mathematical solutions (points 1, 2). After consideration of rules for financing (point 3) the attempt was made to indicate stages in process of preparation the plan for capital structure optimisation; the algorithm highlights the use of suggested mathematical tools. Both suggested process of preparation the plan for capital structure optimisation and mathematical solutions are new elements of theory in this area; this plan is essential for maximization of a company value. The main objective of this study has been achieved.

1. Fundamental Problems of a Company Value

A key theoretical and practical issue for the financial decisions in the companies is to find an optimal capital structure related to their value. Many authors assumes that it is possible to find an optimal capital structure i.e. such a structure which minimizes weighted average cost of capital while maximizing the company value at the same time (Brigham, 1996, t. 2, p. 186).

Besides the financial decisions which influence the capital structure, the company management also make investment decisions, choosing those projects whose implementation is aimed towards maximization of the company value. Company management through maximization of its market value can not be only limited to the increase of capital invested in the company. Company value management should focus on maximization of net effects of investment so that the increase in the involved capital leads to higher than proportional increase in its value.

Since the company value can be understood ambiguously, a need for terminological classification of the described issues arises. In the literature concerning the concept of company value the following terms can be found (Mills, 1998; A. Cwynar and W. Cwynar, 2002, p. 120):

- business value or investment value (BV – Business Value)
- company value (CV)
- equity value or shareholder value (SHV – Shareholder Value, Strategic Value).

Business value is a value which relates to the result of current or future operational activity of a company. The company can, however, make the investments whose valuation, based on operational activity, is not able to identify and reflect the benefits derived from its current value.

The 'business value' increased by all investments which are not of an operational nature is a company value (CV). The benefactors of this value (this means, in appropriate proportion, all the entities which provided the company with capital necessary for its efficient operation) are therefore the shareholders (providers of equity E) as well as creditors (providers of loan capital i.e. debt D). Therefore the following holds true:

$$CV = D + E$$

In public limited companies, it is not the total company value which is considered, but the value of equity, especially equity per share. In order to present the value which is shared by the shareholders it is necessary to deduct, from the company value, a market debt value. On the basis of previous consideration, it is possible to determine the equity value (E) for a company:

$$E = SHV = CV - D$$

This means the shareholders value (SHV) which can be expressed 'per share' (dividing it by total number of ordinary shares being in turnover). Assuming P as a market value (price) of a share, and N as a number of ordinary shares, the value of equity per share can be determined as following:

$$P = SHV / N$$

The dependencies which occur between business value, company value and shareholders value are shown in the following Table 1:

Table 1

	Business Value (BV)
+	Marketable Securities
=	Company Value (CV)
-	Market Debt Value
=	Shareholders Value (SHV)
÷	Number of ordinary shares (N)
+	Shareholders' value per share ¹ (P)

Source: Mills (1998).

¹ During valuation of the considered company the residual value was neglected. This value, at short time prognoses, means prevailing part of a total business value. In the literature, while describing the residual value the terms of *terminal value*, *perpetual*, *continuing value*, *resale value* are also used.

T. Copeland, T. Koller, J. Murrin (1994, p. 42) claim that the owners' (shareholders') willingness to increase the company value is consistent with the interests of other involved parties. They present three arguments for accepting the maximization of company value as a strategic goal for its owners. These include:

- the value is the best measure of the results,
- shareholders (owners) are the only party for whom the maximization of their own demands is consistent with maximization of claims by other involved parties,
- the companies which do not achieve good financial results are doomed to outflow of capital to competitors.

J. Knight (1998, p. 45) also lists a number of reasons for which the company should be managed so that it multiplies its value. These include e.g. preventing undervaluation of the company's shares, improvement in allocation of the resources and planning.

There is a variety of the methods for valuation of the company value in the literature. Due to such a variety those methods have been presented only, which are representative for the groups distinguished according to the similarity of the concept.

There is a full and inseparable division between the property, income, mixed, market and breakeven point methods. The property method is based on the assumption that the company value is determined by the total recognised assets reduced by the borrowed capital. The income methods assume that the goodwill results from the business' ability to generate financial surplus. Currently in Poland the importance of the income methods is not bigger than the importance of the property methods. The mixed methods are the mixture of income and property valuation. The market methods employ well-known price determination for market transactions in companies to approximate the values of the other, similar businesses. The breakeven point methods consist in searching for the highest price which still enables the potential buyer of the company to maintain the ability to reach positive financial results of the company's exploitation.

In valuation of the company done by the discounted cash flows (DCF) method the free cash flows (FCF) are used, i.e. operational cash flows after taxation considering planned investments.

$$FCF = \text{earnings after taxation} + \text{amortization} - \text{total investment in fixed assets} \\ -/+ \text{increase/decrease in net working capital.}$$

The annual depreciation is used to finance the replacement investments.² If total investments in fixed assets are higher than the total of current capital allowances over the whole useful life, it means that a company undertakes net

² Note the difference in English terms *depreciation* and *amortisation*. *Depreciation* relates to capital allowances used for tangible assets while *amortisation* is used for periodical loss in value of intangible assets.

(development) investments. The above definition of free cash flows can therefore be presented as following:

$$FCF = EBIT (1 - T) - \text{net investments in fixed assets and current assets;} \\ (EBIT = \text{Earnings Before Interest and Taxes, } T = \text{Tax rate}).$$

The goodwill, understood as a value of the discounted cash flows in a period subject to prognosis is calculated from the following equation:

$$V = \sum_{t=1}^{t=n} \frac{FCF_t}{(1+k)^t} + \frac{RV_n}{(1+k)^n} + A_{NO}$$

Where: RV_n – residual value for the company at the end of the of the n -th period subject to prognosis i.e. after completion of the period $t = n$, n – number of periods subject to prognosis, k – weighted average cost of capital, A_{NO} – assets not involved in operational activity, such as amassed cash surplus or easily exchangeable (into cash) short-term securities (Duliniec, 1998, p. 134; Copeland, Koller, and Murrin, 1994).

Fundamental elements which determine the company value $W(t)$ in time $t[t_0, K]$ include: predicted capital structure $Q(t)$ and predicted operational profit $Z(t)$, i.e.

$$W(t) = F(Q(t), Z(t))$$

where F is a differentiable two-input-value function, determined for $Q(t)$ and $Z(t)$, when $t[t_0, K]$.

Generalizing this relation we can assume that:

$$W(t) = f(f_1(t), f_2(t), \dots, f_n(t))$$

where functions: f_1, f_2, \dots, f_n are also determined for $t[t_0, K]$ and f function is also known. The f function input values, i.e. functions f_1, f_2, \dots, f_n are successive elements which determine the company's value.

It seems to be logical to assume that the direction of the highest increase in the $W(t)$ value is represented by the following vector function:

$$S(t) = \left[\frac{\partial f}{\partial f_1}, \frac{\partial f}{\partial f_2}, \dots, \frac{\partial f}{\partial f_n} \right]$$

which the f function gradient cognate.

For the given function:

$$S(t) = \left[\frac{\partial F}{\partial Q}, \frac{\partial F}{\partial Z} \right]$$

For a moment $t^* [t_0, K]$, the $S(t^*)$ vector is:

$$S(t^*) = [a_1, a_2, \dots, a_n]$$

where: a_1, a_2, \dots, a_n are invariable and $a_i = \frac{\partial f}{\partial f_i}$ for $t = t^*$

If the maximal goodwill is needed, the elements $f_1(t^*), f_2(t^*), \dots, f_n(t^*)$, should be increased until t^* respectively proportional to a_1, a_2, \dots, a_n ; (a_1, a_2, \dots, a_n invariable).

The optimal capital structure $Q(t)$ for the company is such a value for which the highest value $W(t)$ is achieved.

If it results from the analysis of the function $W(t)$ that $[Q(t^*), Z(t^*)] = [A, B]$, the optimal $Q(t)$ plan value amounts $Q_{opt} = A$. The strategy of shaping the elements $d(t^*)$ and $e(t^*)$ can be used, determined by the equation: $d(t^*) = e(t^*) + A$. It means that the debt $d(t)$ at the time t^* should be higher by A value than the equity $e(t^*)$.

In order to maximize additionally created value, the management of company value requires identification of the factors which can influence increase of the company's goodwill. The most general overview of them was presented by T. Dudycz (2002, p. 28) and D. Walters (1999, p. 242). He assumes that if the basis for valuation of the company value is projection of the future free cash flows which then are discounted back to the moment of valuation, and the basis for valuation of the shares is the number of issued shares, the most important elements which determine the company value include: cash, invested capital and cost of capital.

A. Rappaport (1999), who is one of the first authors who attempted to identify the factors which determine a company value, quotes three main components which have effective impact on value: cash flow on operational activity, discount rate, capital structure.

2. The Capital Structure in Companies

The dilemma of financing a company and its capital structure, irrespective of intellectual progress in the last 50 years or new theoretical and practical solutions, still raises much controversy. Even the term of 'capital structure' is, in many cases, understood and interpreted differently.

There are several methods of qualifying capital structure which can generally be divided into two groups. The first includes the theory of net income (NI), net operating income and the traditional theory which was first presented before 1958. The second group includes the theory proposed after 1958 (encompassing the Modigliani-Miller and Miller models), and the static trade-off theory.

Capital structure in British literature is defined as 'gearing', whereas in American – 'leverage'. M. Sierpińska and T. Jachna (1994, p. 91) observe that the

two terms are used interchangeably in Polish literature and expressed as ‘lever’ or ‘financial support effect’.

Generally speaking, capital structure describes the total capital used to finance the operation of a company i.e. owner equity and borrowed funds. However, as T. Copeland and J. F. Weston (1998, p. 493) note, this rather defines financial structure, and capital structure should reflect the ratio of long-term liabilities to the total of owner equity. According to this concept, capital structure is part of financial structure, which represents total liabilities, hence equity, long-term and short-term liabilities (Jerzemowska, 1996, p. 14; Gajdka, 2002, p. 20; Cumming, 2005). Therefore, capital structure can be noted as follows:

$$CS = \frac{LTL}{LTL + E}$$

where

CS – capital structure,
LTL – long-term liability,
E – equity.

Financial structure is represented as (Petty, Keown, Scott, and Martin, 1993, p. 354):

$$FS = \frac{LTL + STL}{LTL + STL + E}$$

where

FS – financial structure,
STL – short term liability.

In conclusion, the financial structure relates to the total of liabilities in a balance and it encompasses the short-term and long-term debts and equity. The capitals, being the basis for determination of a capital structure, relate to the capitals invested within a company, i.e. the liabilities on which the interest is paid, and the equity. Therefore, in determining the capital amount, the delivery commitments, salary tax liabilities are not taken into consideration since no interest is paid on these liabilities. The capital can be also defined as the sources which finance the fixed and current assets minus non-interest bearing current liabilities. The invested capital is now lower than the balance-sheet amount.

The decisions on capital structure are therefore the decisions concerning the amount and proportions of the equity and borrowed capital in property financing and company’s operation.

The problem of separating such a capital structure out of the financial structure is not too complicated as long as the theoretical considerations are not accompanied with the empirical ones. It becomes more complicated if the theory of

capital structure is compared to the real conditions of Polish economy. Assuming the definition of current liabilities as the short-term liabilities with the maturity date up to one year, this theory would have limited use in analysis of methods of financing of Polish business units in nineties of past century. Contrary to the entities operating under conditions of highly developed economies, in the before mentioned period of time Polish companies insignificantly acquired borrowed capital in form of long-term debts. This means the situation where the entities did not present the long-term liabilities in their capital structure. However, it can be claimed that the capital structure of such entities contains only the equity; in most of cases they used the short-term renewable debts.

3. Rules for Financing of a Company at the Process of Capital Structure Creation

Creation of proper capital structure is ensured by the rules of financing the company. While analysing the risk with regard to capital, its structure and methods of financing company's resources, it should be mentioned that in business reality there is not only one model of financing the assets of the business unit. The company's balance-sheet presented by the Accounting Act in Poland, presents the capital divided into following fundamental groups:

- ownership capital, defined in the literature as the ownership funds,
- liabilities and reserves for the liabilities as borrowed capital.

General analysis of the fundamental balanced sources of financing shows the possibility to make decisions by the enterprises on different activities which ensure the rational management of the assets, assuming the existing liabilities structure. Rational management means maximization of the difference between the effects and the expenses and searching and choice of the most profitable proportion between such effects and expenses. In dynamic economy conditions where more and more important role is played by the qualitative aspect of the economic effects, reaching bigger effects while extending the expenses is becoming of the fundamental importance, however, with faster increase of effects rather than expenses. Amassing and disbursement of the resources for the business activity is defined as a company finance function whose management consists in controlling the acquisition of new sources of financing the activity and investing them in asset components in a way which enables the implementation of a strategic goal. This goal can be a maximization of the profits for the persons or business entities who invested their capital. Companies which employ the rule of profit maximization while minimizing the expenses, choose the most profitable, in their opinion, variants for their property. It should be mentioned that

maximization of profits is based not on the minimization of expenses but rather on maximization of difference between the revenues and expenses.

The method of financing the resources of the business entities is influenced both by external and internal factors. During the described consideration, the analysis of the external factors as a determinant of the choice of method of resources financing has been made. These usually include (Bień, 1996, p. 19; Giner, and Reverte, 2001):

- business communication,
- inflation rate,
- monetary policy,
- fiscal policy.

The method of financing the assets is significantly influenced, except the external environment, by the internal factors. The most important factors include (Altman, 1983, p. 40; Argenti, 1976, p. 123; Copeland, and Weston, 1998, p. 488; Emery, and Fennerty, 1991, p. 465; Hall, 1992; Levy, and Sarnat, 1986, p. 383):

- quality of the management processes,
- quality of the managerial staff,
- quality of the information system,
- control over the company by the owners,
- quality of the assets, especially the long-term assets,
- organizational culture.

Scale and the method of how the business activities are carried out dependent on the level and profitability of the undertaken enterprises. While diversifying the operational area of a company, the general level of the financial situation associated with the method of financing the assets is the resultant of the external and internal factors which determine the capital structure. While analysing the described strategies of financing of company's assets, it is possible to come to general conclusion that proper balance-sheet structure, with the possibly acceptable financial risk, consists in such an association of the assets with the liabilities that the flow of resources in assets corresponds with the liabilities paid on timely basis. What results from the following is that the time of use of the assets should be equal to the time of tied-up capital.³

Such an assumption was made for golden balance rule. Its idea consists in the assumption that the division of the assets into fixed and working assets corresponds, in liabilities, to the division into the tied-up long and short-term capital. According to this rule:

- 1) fixed assets should be, if possible, financed by the ownership capital,

³ This principle is valid for individual assets, see *Analiza ekonomiczna w przedsiębiorstwie* (1993, p. 105).

2) if it is not possible – the proper source of covering the fixed assets is a long-term borrowed capital, however, the total amount of fixed capital i.e. the ownership capital and long-term borrowed capital should exceed the value of the fixed assets (Krzemińska, 2000, p. 38; Leszczyński, and Skowronek-Mielczarek, 2004, p. 218; Sierpińska, and Jachna, 2004, p. 76).

Golden financing rule completes the abovementioned rule and consists in two inequalities:

$$1) \frac{\text{long-term assets}}{\text{long-term capital}} \leq 1$$

$$2) \frac{\text{short-term assets}}{\text{short term capital}} \geq 1$$

There is a conviction that in case of maintaining the relations resulting from the presented inequities the possibility to maintain the solvency i.e. the ability to settle liabilities should be reached.

The inequities presented by the golden financing rule reflect the fundamental concepts and can not be used for a comprehensive assessment of the method of financing the company's assets, however, they express in a precise way the general assumptions on the rules of covering the assets with the liabilities, with the existing internal and external conditions.

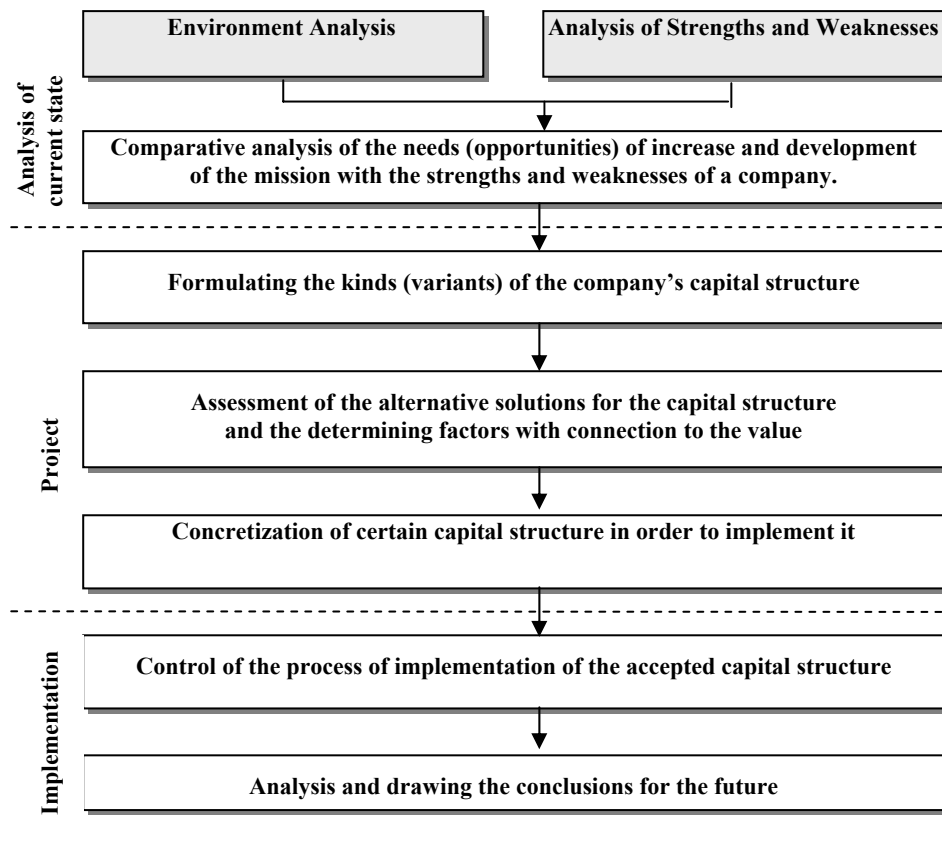
Such an inclusion of the rules for financing to considerations over the capital structure is a necessity which results mainly from the concern to present the essence of the capital structure as an instrument of the management of the company value, closely related to the economic conditions of its efficient functioning and development. The presented rules for financing are supposed to show that they are the tools for the financial policy of a company, influenced by many rules for rational management of the business units; they determine, together with the capital structure and the cost analyses, main areas of analysis of business financing. Hence, the rules for financing influence the increase in company value.

4. Process of Preparation of the Plan for Capital Structure Optimisation in a Company

In the conditions of market economy, the managers must consider the necessity to use the methods and instruments which aid the preparation of the capital structure in order to reach the strategic goals of their companies. One of the most important goals, as it results from the previous considerations, is to increase the company value. During strategic activities an important role is played by the suggested account for the optimisation of the capital structure, which is one of

the elements of the process of preparation of the plan for the capital structure optimisation. During process of preparation this plan its three main stages can be highlighted, namely: analysis, project and implementation (Fig. 1).

Figure 1
Process of Preparation the Plan for Capital Structure Optimisation in a Company Related to Company Value



Source: Own study.

The analysis of the process of planning the optimisation of the capital structure (I stage) consists of: analysis of the environment, analysis of strengths and weaknesses and comparative analysis. The starting point for planning the capital structure in a company is the analysis of its environment which consists of the circumstances, phenomena and processes which occur outside the company. Therefore they are the elements which make up the organization's environment including technical, economic, social, legal, political and ecological factors (Penc, 1999, p. 21).

The enterprises operate in a specific environment, i.e. in relation to other enterprises, in certain region. Such an environment interacts with the enterprises, gives them some chances and opportunities, requirements and limitations, but also the enterprises influence the external environment, bind them to each other, and more or less, determine its nature (character). There are many domains of the environment which influence the company, their complexity and changeability (turbulence) are increasing. The turbulence means that the variations (changes) in a company environment are faster and faster, multi-directional, resulting from different factors and more difficult to be predicted. Hence, the environment is becoming more and more (Bolesta-Kukulka, 1993, p. 79):

- *comprehensive* – due to the globalisation of markets and exchange of information;
- *differentiated* – due to the appearance of new groups of customers with special preferences or narrow market niches;
- *instable* – caused by the increase in competition, shortening of the lifetime for the products, political breakthroughs etc.;
- *complex* – which means that there is more and more intensive relation of the processes and phenomena.

Scope of the relation of the companies with the environment is currently not only limited to the technical and economic area, but it extends to the area of social, political and cultural problems.

J. Gościński (1989, p. 78), and J. Lichtarski (1995, p. 137) highlights such domains of the environment, which influence the company, as: government, economic conditions, raw materials and energy, market, social assets, technology, capital and culture. Identification of the environment enables the determination of the opportunities and threats from the external environment and such a choice of support where the enterprise will flexibly adjust to the changing conditions of the environment. The analysis of the external environment is led simultaneously to the internal analysis in a company which consists in determination of its strengths and weaknesses. SWOT analysis is therefore an important one; it exposes the problems of capital and company value. Usually such an analysis is performed by division the whole company into the individual segments, according to branches, markets etc. Such segmentation may be also performed in a vertical arrangement, both for the product and the company management; the method of division into elements depends mainly on the purpose of the analysis and its scope. The result of the analysis is the determination of the power of a company in terms of capital structure, sources, weaknesses and its causes, prospective opportunities and threats and the probability of its realization or appearance.

First stage of the analysis of the process of planning the capital structure optimisation is concluded by the comparative analysis of the appearing needs (opportunities) for the development (mission) with strengths and weaknesses of the previous capital structure. Proper formulation of the mission (vision) is not an easy task and requires consideration of many circumstances, including current and future demands from the environment. The mission is usually understood as declared goal of a company in relation to the environment. Such a goal influences meeting the expectations of the company's customers, region and society. According to W. Wawrzyniak the mission of a company means the subject of its aspirations i.e. continuous pursuance which determines the scope of its social activity (Wawrzyniak, 1986, p. 45). J. A. F. Stoner and C. Wankel (2001) define the missions as specific reasons for company's existence. This mission means an increase in company value.

Recognition of external and internal conditions for company's operation enables to make a quantitative and qualitative comparison of individual variants of capital structure currently available or for the future. At the stage of generating the capital structure variants the assessment of the factors which determine their types; these factors make up the network of key variables influencing the decisions on choice of certain capital structure supported by gradient cognate also takes place. The use of mathematical methods at this stage of preparation the plan for optimisation of a capital structure gives the opportunity to the management to consider higher number of alternative solutions significant for maximization of company value. After implementation of the postulated changes in capital structure the influence of the accepted solutions should be continuously monitored. In case of significant changes in environment, the reanalysis of capital structure variants should be performed on the basis of a feedback. The suggested plan of optimisation of capital structure is consistent with a dynamic perspective to a company's capital structure accepted in previous considerations.

In next stage the choice and realization of chosen capital structure takes place and it is subject to control. Such a control should not be limited only to comparison of the actual state to the planned one. The control should be understood as a phenomenon which accompanies the whole process of activities which enables creation of the optimal structure of capital. Creation of different options and choice of the leading capital structure requires systematic control in terms of assessment of the level of realization of the company's goal i.e. the increase in the company value.

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The final stage of the presented process is the analysis of achievements and drawing the conclusions for the future.

The described process of optimisation of the capital structure does not have a closed nature i.e. it depends on the nature of a company, differentiation of its assets or on the availability of the sources of financing. In the contemporary world the sources of financing of companies are made international thanks to the capital relations to the foreign entities from many different countries. This fact implies the necessity of further improvement in tools which optimise the capital structure, which, consequently, strives for the increase in the company value.

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