Optimal Indebtedness of the Concrete Firm in the Passive Way of Optimizing

MILAN HRDÝ
Department: Corporate Finance and Valuation
University: University of Economics, Prague
CZECH REPUBLIC

Abstract: The aim of this article is to analyze the problem of optimizing of the capital structure of the concrete firm in the passive way of optimizing and to find some possible branch standards in the chosen branches. The most important problem in the theory of optimizing is to identify the theory which best fit and in practice it is necessary to cope with some application problems which results from the use of the concrete theory. The firm in fact has to decide firstly if to start the process of active optimizing or if it is satisfied with the passive way of optimizing by respecting the branch standards or by respecting the Pecking Order Theory. In case of branch standards the firm is trying to come near the average indebtedness in some concrete branch and in case of the Pecking Order Theory the firm follows the recommendations of this theory and use firstly the internal financial sources, then debt and finally the equity. The most important application problem in case of using the branch standards is the identification of the average indebtedness in some concrete branch and to judge if this average indebtedness is possible to use as this standard or if it is necessary to adjust this amount according to the other factors. In case of using the Pecking Order Theory it is necessary for the firm to have all financial sources available otherwise the process of optimizing means only findings actually any kind of financial source. The concrete branches were chosen and some concrete data were analyzed. It was found out that the branch standards are relatively complicated way of optimizing of the capital structure of the firm, but relatively feasible. The branch standards on the level of 50 % of indebtedness were recommended for the branch of Beverages and Construction Supplies, on the level of 45 % for the branch of Railroads, on the level of 40 % for the branch of Electrical Equipment and on the level of 35 % for the branch of Machinery.

Key-words: Optimizing - Capital Structure - Concrete Firm – Branch Standards – Passive Way

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. There are a lot of theories available, but the final process of optimizing of the capital structure of the concrete enterprise is very complicated. It is necessary firstly identify the theory which best fits and then copes with the application problems linked with single theories. The practical optimizing also depends on the choice of active or passive way of optimizing of the capital structure of the concrete firm [5]. The optimizing of the capital structure of the concrete firm is also important because the final average cost of capital is used not only for the identification of the optimal capital structure, but also for the identification of the optimal amount of business capital and for the identification of the discount interest rate in the process of the investment decision. It is supposed that the investment has the same risk and the same capital structure as in existing business. If the weighted cost of capital are underestimated, the bad projects could be accepted and vice versa [4].

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 this optimizing and if this potential is possible to apply in practice.

The aim of this article is to analyze the problem of optimizing of the capital structure of the concrete firm in the passive way and to prepare some concrete recommended branch standards in the chosen branches which the firms could follow.

The aim realization requires firstly the description of the different ways of optimizing of the capital structure of the concrete firm and then to concentrate on the passive way of optimizing.

Secondly it is necessary to try to describe the application problems of the passive way of optimizing and to specify some concrete recommendations for the practice and try to identify the average indebtedness in some concrete branch and to judge if this average indebtedness is possible to use as this standard or if it is necessary to adjust this amount according to the other factors.

The methods used for the realization of this aim are the analysis of the theoretical basis and the practical experience, the methods of comparison and finally the synthesis of the acquired information.

2. Literature Review and Problem Formulation

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 optimization. There are mainly the following theories [4]:

1. Traditional Theory.
2. Pecking Order Theory.
3. Theory of Modigliani-Miller.
4. Compromising Theory.
5. Brealey and Myers Theory About Four Dimensions of the Capital Structure.

Traditional theory is based on the average costs of capital and considers as t he 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.

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

Modigliani and Miller [8] published two propositions. The first states that the market value of the enterprise does not depend on the structure on the capital. According to the approach the process of the optimizing of the capital structure of the concrete enterprise does not have matter. They in a simplified way supposed tax free environment and perfect capital markets. In a second proposition the existence of taxes was admitted and the maximum debt was recommended. But they don´t consider the existence of the financial distress costs. This approach was corrected [8]. Despite some inconsistence this theory is still live and they are extensive discussions mainly in connection with 50^{th} anniversary of this theory.

Compromising theory considers the optimum of the capital structure as t he point where the interest tax shield exceeds the cost of financial distress on a maximum level. Also the stability of the firm´s profit and the structure of the long-term assets are important. The higher share of long-termed tangible assets and the stability of the expected profit support the possibility of the higher indebtedness.

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

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

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 – see later.

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 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 [3]. The great change could happen if the indebtedness will be so high that it could threaten the financial health of the firm.

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. Levy, Sarnat [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. According to the author´s view 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 practice is not recommended.

The second proposition of the Modigliani-Miller theory cannot be used because it does not consider the cost of the financial distress. Also Brealey and Myers theory about four dimensions of the capital structure could be eliminated because it does not offer some concrete amount of indebtedness.

So there is a lot of theories, but 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 [5]. Then it is necessary to judge if to realize the active or passive way of optimizing of the capital structure.

The active way of optimizing represents the afford of the firm to find the optimal indebtedness by the identification of the average weighted cost of capital or by using the Compromising Theory or Theory of Brealey and Myers about Four Dimensions of the Capital Structure.

The passive way of optimizing means that the firm respects the branch standards or follow the Pecking Order Theory and then the final indebtedness is the result of its financing.

This article is concentrated on the passive way of financing so it is necessary to solve if the Pecking Order Theory is possible to use and if it is possible to identify the average indebtedness in some concrete branch and if this indebtedness is possible to use as this branch standard.

3 Problem Solution in Case of Pecking Order Theory

Pecking Order Theory is seemingly without application problems because the firm´s managers act according to the clearly defined procedure [4]. They use the internal financial sources as long as they are available. Then the managers use the debt and finally could acquire external finance by issuing new shares. But in reality it is a bit complicated.

If there are enough internal financial sources there is no problem and the optimal capital structure is represented by zero indebtedness. This approach could be recommended to the small and medium

firms where it is not necessary to solve the active way of the optimizing of the capital structure.

If there are not enough internal financial sources for the business activities, it is necessary to use the debt and the final indebtedness depends on t he amount of debt. If this amount is the same as it is the amount of the internal financial sources the indebtedness is 50 % etc. So this amount of indebtedness is the result of the amount of debt. The problem is if the firm is not able to obtain the required debt. Then it is not possible to realize this passive way of optimizing of the capital structure and as the optimum is considered the possibility to obtain any kind of financial sources.

The specific situation occurs if the firm could obtain some grant which is considered as the external, but own financial source. In this case this state financial subsidy support the internal financial sources and the final indebtedness is then the ratio of debt over internal and external own financial sources. Also in case of this grant the firm usually could obtain easily some loan.

Otherwise the passive way by using the Pecking Order Theory is relatively acceptable, this approach very often merge into the process of findings of any kind of financial source and for that reason could be more acceptable to use the passive way of optimizing of the capital structure by accepting the branch standards.

4 Problem Solution in Case of 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 acceptation of these branch standards. Talberg et al. [9] also demonstrates significant difference in the capital structure depending on the industry.

But the problem lies in the identification of these branch standards. It should be the average indebtedness in some concrete state or it is necessary to adjust these figures according to the indebtedness in some different states or areas, as for example Europe, USA etc? So it was made some small analysis concerning some chosen areas and there was some trial to identify some branch standards for the Czech Republic.

Data for the research were obtained from the database Albertina at the University of Economics in Prague for the period 2008 – 2013. This data was adjusted by elimination of the indebtedness over 100 % and of the negative indebtedness. The only problem of the sources of information is the reality is that not all the firms fulfil their obligation to publish the financial statement. In other respects are the data relatively very credible with its information value. The objects of the research were the following branches: branch Beverages, branch Machinery, branch Electrical Equipment and branch Railroads. The figures are shown in the following tables:

Table 1 The average indebtedness – branch „Beverages“

Year	Number of Firms	Average Indebtedness
2008	231	52,63 %
2009	242	52,25 %
2010	241	47,63 %
2011	236	47,58 %
2012	225	48,44 %
2013	142	50,09 %

Source: Albertina Data, University of Economics in Prague, 2015

The table shows the initial decrease in the first free years and then the stabilized position in three years and finally the moderate decrease in the last year. So it could be the average indebtedness and the branch standard stabilized on the position of 50 %.

Table 2 The average indebtedness – branch „Machinery“

Year	Number of Firms	Average Indebtedness
2008	1 575	48,40 %
2009	1 649	45,40 %
2010	1 668	46,00 %
2011	1 654	45,67 %
2012	1 522	44,40 %
2013	1 010	43,50 %

Source: Albertina Data, University of Economics in Prague, 2015

The table shows the decrease of the average indebtedness in the years with the changes in the speed of this decrease. But the final decrease continues permanently and it is very complicated to identify the frontier where the decrease could stop. So the average indebtedness as the branch standard

is very complicated to identify. It is also very complicated to identify the reason of this decrease maybe it could be because of the termination of the firms with relatively higher amount of debt or because of the increase of the share of firms own financial sources.

Table 3 The average indebtedness – branch „Railroad“

Year	Number of Firms	Average Indebtedness
2008	81	48,40 %
2009	87	46,40 %
2010	93	44,80 %
2011	94	44,80 %
2012	97	47,20 %
2013	68	48,40 %

Source: Albertina Data, University of Economics in Prague, 2015

The table shows that the development of the indebtedness has the shape of so called U-curve, because after the initial decrease follows increase approximately to the same position. The situation could be caused by the entry of the new subjects into this industry which leads to the repeated increase of the indebtedness. To identify the average indebtedness is here very complicated, but the extent on the frontier 45 % - 50 % could be acceptable.

Table 4 The average indebtedness – branch „Electrical Equipment“

Year	Number of Firms	Average Indebtedness
2008	1 039	45,20 %
2009	1 159	43,90 %
2010	1 218	43,20 %
2011	1 204	42,30 %
2012	1 127	40,90 %
2013	753	38,70 %

Source: Albertina Data, University of Economics in Prague, 2015

The table shows that as in case of the branch Machinery there is the decrease of the indebtedness and this decrease in this branch is relatively steady. Again it is very complicated to identify the boundary of this decrease and so the average indebtedness and the branch standard is not possible to reasonable identified.

Table 5 The average indebtedness – branch „Construction Supplies“

Year	Number of Firms	Average Indebtedness
2008	4 573	58,40 %
2009	4 890	55,60 %
2010	4 936	54,60 %
2011	4 874	53,70 %
2012	4 448	52,40 %
2013	2 735	52,23 %

Source: Albertina Data, University of Economics in Prague, 2015

The table shows in contrast to the previous branches the decrease with reducing tendency and this decrease could stop at the frontier of 50 % and this figure could be the average indebtedness and the branch standard for Construction Supplies.

As it was stated in previous text the branch standards represent some average indebtedness the enterprises are trying to follow. But to identify this average indebtedness and so the branch standards, is very complicated. They are different trends in the development of the indebtedness in the different areas and these trends are very complicated to predict and to justify. For example the development of the indebtedness is very often decreasing with the problem of the identification of the boundary where this trend stops or there are relatively great fluctuations. How to cope with this situation? Some solution could lie in the help of the average indebtedness in Europe because there is relatively similar debt politics based mainly on t he bank credits.

The average indebtedness and the branch standard for the branch Beverages were recommended on the position of 50 %. This figure could be compared to the European value which is 46 % [2]. So the valuation standard on the position of 50 % could be confirmed.

The average indebtedness and the branch standard for the branch Machinery were not recommended because it is not known when the trend stops. So this point could be identified on the level of European values about 35 % [2].

The average indebtedness and the branch standard for the branch Railroads were recommended between 45 % - 50 % which is very strongly higher than in Europe, where the indebtedness is on the level of 39 %. So again the branch standard could be recommended rather on the position of lesser value of 45 %. It is possible that after the stabilization of the railroad market in

the Czech Republic the indebtedness will fall to the value about 40 %.

The average indebtedness and the branch standard for the branch Electrical Equipment were not recommended in previous because it was not possible to identify the boundary of the permanent decrease of the indebtedness. So the European value about 40 % [2] could be recommended.

The average indebtedness and the branch standard for the branch of Construction Supplies were recommended on the position of 50 % if the trend will be continuing and this is in reality the convergence to the European value of 50 % [2].

5 Conclusions

The aim of this article was to analyze the problem of optimizing of the capital structure of the concrete firm in the passive way and to prepare some concrete recommended branch standards in the chosen branches which the firms could follow.

The identification of the concrete optimal indebtedness is very complicated to identify because it depends on t he approach of the concrete firm to the process of the optimizing. There are the passive way of optimizing and the active way for optimizing. Passive way is better for the small enterprises whereas the active way is suitable for the larger companies. There are also problems with a lot of application problems if some concrete theory is chosen.

For the above mentioned reason it could be more acceptable to use the passive way of optimizing of the capital structure by accepting the branch standards. But also the acceptation of the branch standards is not without problems.

The branch standards represent some average indebtedness in some concrete branch which the firm is trying to follow. But the problem lies in the identification of these branch standards. It is not possible to identify these standards according to the indebtedness in single year, but it is necessary to analyse some longer time series. The problem is if these time series are permanently decreasing and it is not possible to identify where they stop. So the European figures could be used for help.

The average indebtedness and the branch standard for the branch Beverages were recommended on the position of 50 %. This figure could be compared to the European value which is 46 % [2]. So the valuation standard on the position of 50 % could be confirmed.

The average indebtedness and the branch standard for the branch Machinery were not recommended because it is not known when the trend stops. So this point could be identified on the level of European values about 35 % [2].

The average indebtedness and the branch standard for the branch Railroads were recommended between 45 % - 50 % which is very strongly higher than in Europe, where the indebtedness is on the level of 39 % [2]. So again the branch standard could be recommended rather on the position of lesser value of 45 %. It is possible that after the stabilization of the railroad market in the Czech Republic the indebtedness will fall to the value about 40 %.

The average indebtedness and the branch standard for the branch Electrical Equipment were not recommended in previous because it was not possible to identify the boundary of the permanent decrease of the indebtedness. So the European value about 40 % [2] could be recommended.

The average indebtedness and the branch standard for the branch of Construction Supplies were recommended on t he position of 50 % if the trend will be continuing and this is in reality the convergence to the European value of 50 % [2].

This article was prepared in the frame of the institutional support of the Faculty of Finance and Accounting University of Economics in Prague IP 100040.

References:

[1] Brealey, R.A., Myers., S.C. *Principles of Corporate Finance.* Fourth edition. New York: McGraw-Hill, Inc, 1991.

[2] DAMODARAN, ASWATH. 2015. Damodaran on Line – The Data Page. [cit. 2015.03.06]. Available on: <http:// pages.stern.nyu.edu/~adamodar/>

[3] Hrdý, M., Marek, P. Does Optimizing of the Capital Structure of the Concrete Firm Matter in the Practice of Corporate Finance? Melbourne 19.11.2012 – 21.11.2012. *In: Proceedings of 19th International Business Research Conference*. [online] Melbourne : SSRN, 2012. 9 s. ISBN 978-1-922069-13-9. URL: http://ssrn.com/abstract=2174472

[4] Hrdý, M.; Marek, P. Optimizing of the Capital Structure of the Concrete Firm in the Theory and Practice of the Temporary Corporate Finance, 2012: *In Conference Proceedings of*

the 4th WSEAS World Multiconference on Applied Business and Development (AEBD'12). Porto - Portugal: WSEAS Press, 2012, pp. 77-82

[5] Hrdý, M. Optimazing of the capital structure of the concrete firm and branch standards. *Czech Financial and Accounting Journal*, 2013, volume 8, N. 2, pp. 74-83;

[6] Křivská, R., 2009. *Determinants of the Capital Structure and their Optimizing* – Doctoral Dissertation Work. Praha: VŠE, 2009.

[7] Levy, H.,Sarnat, M.: *Capital Investment and Financial Decision*. Praha: Grada Publishing, 1999.

[8] Modiglani, F, & Miller, M. H. Corporate Income Taxes and the Cost of Capital: A Correction.*The American Economic Review*. Vol. 53, 1963, Iss. 3, pp. 433-443.

[9] Talberg, M. , Winge, C., Frydenberg S. et al. *Capital Structure across Industries*. International Journal of the Economics of Business, Vol. 15, No. 2, pp. 181-200.

[10] Valach, J et al. *Investment Decision and Long-Termed Financing.* 3. Ed., Praha: Ekopress, s.r.o., 2011.