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Scientific Methodological Basis of the Risk Management Implementation for Companies' Capital Structure Optimization

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ABSTRACT

The relevance of studying the issues related to the risk management implementation for companies' financial management system advancement is explained with the research among scientific methodological studies and commercial enterprises' practical activities of some ways to optimize the capital structure taking into account various factors that impact on this structure. There are no methodological and practical guidelines for solving the given problems. Basing on the employment of the theory-empiric methods of investigation a unifying model of commercial enterprises' risks evaluation and management has been developed. The novelty of the investigation results consists in working out a matrix of the main reasons for analyzed risks arising and of a relationship model "risk-reason" that helps to estimate the most important causes for each basic risk and to evaluate the probability of every cause occurrence. Moreover, the authors have proposed and described a relationship matrix "risk-reason": find out a critical cause having the greatest impact on the company's activity riskiness, put the causes in order of occurrence frequency, set a rating for the essentiality of the cause impact on company's activity risk. Applying the methodological approaches of the risk management implementation for companies' capital structure optimization for real business would let to improve the financial management efficiency leading to the raise of enterprise business performance results.

KEYWORDS
Capital structure; cost of capital; risk management; financial management; leverage; capitalizationitalization

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Introduction

Under the nonstationary economy's conditions the procedures, that can help to simulate the capital structure, evaluate the link between its changes and commercial enterprises' financial performance results, become more and more important. At the same time, it is essential to understand exactly which risks could impact the capital structure and in what way and how this process could be controlled using the risk management principles.

According to A.N. Zadorozhna (2015), doing this requires to highlight the main criteria that should define the company's capital management effectiveness. First of all, it is the capability of economic entities to perform an affective financial and business activity. A. Levy (2007) takes the view that it is also essential to take into consideration the higher risks going along with goods' and services' creation and promotion, new control process implementation, well-timed creation of information and legal environment for high-risk activities. Moreover, A. Damodaran (2004) draws attention to the role of the financial resources cost in financial and business activities under the nonstationary economy's conditions.

On the back of the main concepts of financial management, S. Bhamra, L. Kuehn & I. Strebulaev (2010) has proved that such guidelines as maximization of the cost of capital and economic entities' competitiveness are going to provide their successful performance.

In the authors' opinion, the moat important task under the nonstationary economy's conditions is the target criteria optimization of the company's capital (target function). Optimal capital structure for each specified period should be based on the factors of internal and external environment. Optimization process is discrete but continuous in strategic prospect. Optimal capital structure is the debt-to-equity ratio at which the required balance between financial sustainability and return of capital employed is achieved.

This means that researching the factors affecting the capital structure, developing viable ways of accounting these factors in commercial companies' financial performance, including the risk management principles application, will contribute not only improving financial results of companies' activities, but also increasing their competitiveness. All the above-mentioned facts prove the importance of the research issue reflected in the article title.

Methodological Framework

Methodological basis of this study comprises the works of the following scientists: S. Bhamra, L. Kuehn & I. Strebulaev, (2010), Z. Bodie, A. Kane & A. Marcus (2002), R. Braley & S. Myers (2008), A. Damodaran (2004) and others who studied the scientific basis and the essence of the companies' capital structure management process. In their works much attention is given to the issues of risk factors influence on the companies' capital structure optimization process.

To analyze the exist capital structure of Russian and foreign companies the authors have applied the methods of economic and statistical analysis, economic and mathematical simulating.

Besides, basing on theoretical and empirical research methods, a unifying risk control model (risk management) has been worked out. It is aimed to decrease the risk level in the company's financial activity and to optimize the capital structure.

Literature review

The most common theories to ground the capital structure optimization within the life cycles, macroeconomic cycles are the next ones: the theory of financial sources hierarchy and the compromise theory.

The theory of financial sources hierarchy holds that the risk – a key integral optimization factor – necessitates to put financial sources in the following order: undistributed profit, debt-based sources, owned capital tools. The advancement of this theory proves its applicability (Malysheva et al., 2016).

Expanding this line of research A. Zoppa (2002) proposed the modification of this theory for small and medium businesses. The priority of financial resources employment has been allocated in the following way: reinvestment of profits, short-term debt financing, long-term financing, new stock capital, "business angel" venture capital financing.

The compromise model focuses on the two factors allowing to optimize the capital of a finance dependent company: "tax shield" (changes of loan and tax rates affect the tax shield changes) and "bankrupcy cost" (direct and indirect costs).

Among the main external factors, that have impact on the capital structure nowadays, A. Miglo (2016) points out the following ones:

— legislative regulation of the capital amount;

— tax burden on the cost of capital;

— necessity to account "net assets" amount;

— maturity level of financial market's sectors (banking sector, securities market);

— interest rates;

— macroeconomic cycles.

The capital structure control activations are inherent in the next stages of the optimization process (Lubnina et al., 2016):

— capital evaluation;

— evaluation of the main factors affecting the structure formation;

— selection of the level of financial efficiency, cost escalation, financial risks criteria;

— selection of the tools of the capital structure formation and/or transformation;

— achieving the target structure under the current conditions.

Empirical studies concerning the issues related to the dependence between capital leverage and life cycle phases, as well as macroeconomic cycles have been conducted. According to the results of the built regression functions, it is possible to infer about the negative relation between these indices. The two investigation groups can be divided (leverage variation in companies by the example of two types of enterprises): more financially limited and less exposed to financial risks. Enterprises of the second type have a higher leverage value during the recession period, relative to the economic growth period. The leverage of these companies is counter-cyclical. According to A. Levy's (2007) estimations, enterprises of the first type have procyclical leverage.

Russian surveys figures that the most successful Russian companies are those that follow the conservative debt policy and the leverage value of 30 % among other management measures represents a certain optimal weighted value (Kokoreva, 2012).

Results

Taking into account the factors, which affect the capital structure formation, in the frames of the capital cost estimation models.

The most illustratory factors affecting the capital structure formation are cost parameters. Practically, for listed companies the cost amount is often fixed with accordance to the on-exchange evaluations, and the EV index is used as the sum of market capitalization and net debts (net debt is equal to the rental sources of finance reduced by monetary means in the assets side of the balance sheet) (Rajan & Gopalan, 2015).

The following models of the company's capital cost estimation and of the diagnostics of its growth are familiar (Arnoud, 2011, Porras, 2011, Elsas, Flannery & Garfinkel, 2014):

1) discounted cash flow (DCF);

2) parameters for the project estimation: NPV, IRR;

3) economic profit model with the modification of residual profits or economic value added;

4) Holt company's cash flow return on investment (CFROI) model;

5) cash value added (CVA) model.

The fundamental differences of the factors included into calculations are summarized in table 1.

Table 1. Comparative analysis of the capital cost estimation models with the different factors included into calculations.

Model / Factor	EBIT, EBITDA	OCF, FCF	ROA, ROE, ROCE	RI^{MV}	NPV, IRR	EVA	CVA, SVA, EM	CFROI
Performance time consideration	-	-	-	-	+	-	+	+
WACC consideration	-	-	-	+	-	+	+	-
Cash flow consideration	-	+	-	-	+	-	-	+

The table is drawn up by the authors on the ground of The Cost of Capital, E. Porras (2011).

Recommendations on risk management principles application into organization's capital structure optimization

To reduce the amount of organization's aggregate loss it is essential to develop complex risk management model aimed at decreasing risk level in the company's financial activities and at optimizing capital structure. Such program must include

a complex of interdependent subsystems that allow to conduct such processes as: forecasting; rational organization and providing the necessary resources; control of these resources; identification of basic factors modification causes that influence the company's performance; monetary estimation of these factors influence on resources management quality; development of focused reasonable steps to eliminate and to lower company's losses caused by the adverse impact of these factors.

The aim of this program is to provide an appropriate margin of market reliability and of capital protect ability from the adverse impact of business environment factors. The program efficiency severely depends on the company's managers' ability to forecast risk-related spectrum of activities and the amount of emergency funds necessary to eliminate adverse consequences. The managers also should make efficient use of existing risk management frameworks as well as of the modified one of its basis methods taking into account certain company's specific features.

In the authors' opinion the most efficient way to calculate risk factors is to form the matrix of main reasons of the analyzed risks' appearance. One basic reason may influence various basic risks changes. Thus, it is advisable to form the matrix of main reasons of the analyzed risks' appearance that will include K- basic risks, and P- basic appearance reasons: MR= MR…, k=1,K, p=1, B where MR… is an element laying at the intersection of K-line and b- column. The element equals 1 if the p-reason is the basis for the k-risk appearance and it equals 0 if p-reason doesn't result in k-risk appearance.

The matrix of the main reasons of risk spectrum activities is presented in the table 2..

Table 2. Matrix of main reasons of the basic risks' appearance

Basic risk	Reasons of basic risk appearance			
	R1	R2	…	p-R
BR1	0	1	0	1
BR2	1	0	0	0
…				
k-BR	0	1	0	1

Thereafter it is advisable to apply the relationship model "risk-reason".

On the ground of the MR matrix the relationship model "risk-reason"(table 3) is formed. This model represents the matrix of the main non-recurrent reasons for risk appearance within the company. Basic risk factors are pointed out in lines, expert estimation of risk appearance reasons are indicated in columns. Expert estimation value can be set using the basic concepts: 0-no impact, 1- slight impact of a reason, 2- lower than average impact, 3- average impact, 4- impact above the average, 5- great impact.

Table 3. "Risk-reason» Relationship matrix (MRR)

Basic risk	Basic risk appearance reason				Score in line	
	R1	R2	…	p-R		
BR1	1	3	1	4	X1	
BR2	5	4	2	3	X2	
…					…	
k-BR	2	3	4	1	k-X	
Score in column					ΣXcr	=

	У1		У2		…	УВ	∑Уcr
Reason appearance probability	P(R11) = У1/∑Уp	=	P(R2) = У2/∑Уp	=	…	P(Rp)= УВ/∑Уp	1

Such matrix allows to:

1. Indicate major reasons for each basic risk appearance and appearance probability of each p-reason for a basic risk: P(Rcr) = BRcr / ∑BRcr, P(Rcr) ≥ 0, к = 1,К, p = 1,P

2. Identify the expert score of total reasons for each k-basic risk (∑Xcr) and this score correspondence for the greatest possible score:

УРcr = (∑Xp) / (5×P), (1/(5×P)) ≤УРcr ≤ 1, к = 1, К, p = 1,P

The closer УРк value to 1 is, the more substantial the influence of the analyzed reason on the k-basic risk.

3. Identify the expert score of each p-risk appearance reason (∑Уp), its correspondence for the greatest possible amount (5 x К), and the appearance probability of k-risk appearance reason in the company's activities:

Pp = Уp/∑Уp, 0 ≤ Pp ≤ 1

УР(Rp) = ∑Ук/ (5 × К), P(Rpp) = Уp/ (∑ Уp), к = 1, К

The closer УР(Rp) value to 1 is, the more substantial the influence of the p-reason on the company's activity risk appearance probability.

The example of the "risk-reason" matrix is represented in table 4.

Table 4. "Risk-reason" Relationship matrix

Basic risk	Basic risk appearance reason				Score in line
	R1	R2	R3	R4	
BR1	1	3	1	4	9
Reason appearance probability for BR1	0,11	0,33	0,11	0,44	1
BR2	5	4	2	3	14
Reason appearance probability for BR2	0,36	0,29	0,14	0,21	1
BR3	4	4	1	2	11
Reason appearance probability for BR3	0,36	0,36	0,09	0,18	1
BR4	2	3	4	1	10
Reason appearance probability for BR4	0,2	0,3	0,4	0,1	1
Score for reasons (for column)	12	14	8	10	44
Reason appearance probability	0,2727	0,3182	0,1818	0,2273	1
Correspondence for the maximum - 20	0,6	0,7	0,4	0,5	2,2
Reason appearance probability with regard do maximum	0,2727	0,3182	0,1818	0,2273	1
Reason degree of impact towards the most crucial reason по GI(R), %	85,70	100	57,13	71,43	
Reason rating in order of	2	1	4	3	

impact, r(R)

On the ground of the relationship model "risk- reason" it is possible to:

1. Identify the crucial reason that has the biggest impact on company's activities riskiness (Rcr): Rcr(Rz) = max(R(Rк))

2. Calculate the degree of impact of each analyzed reason towards the crucial reason: CT (Rcr) = P(Rк) / P(Rz) x 100 %

3. Put the reasons in order of frequency of occurrence, to set a rating of risk influence relevance r(R) on the company's activities' risk. The less the r(R) value is, the more relevant the risk influence relevance on risk appearance is. In the matrix in Table 3 the rating is given by R1, R2, R3, R4.

4. Present the total of all the reasons of company's activities risk spectrum appearance (R) in the form of numerous subcollections that are aligned with certain band of risk spectrum each. The rule of dividing reasons into subcollections is set on the basis of the calculated probability value by company's managers guided by the requirements for risk appearance level detailing. Given the minimum and maximum probability variation of [0, 1] reason, it is possible to set the risk spectrum scale dividing the interval into equal segments. For example, if we divide into 4 intervals with 0,25 pace. Each interval will be aligned to the corresponding risk level. The characteristics of each level are presented in the Table 5. The received value of risk reason appearance probability is compared with the mentioned activities risk spectrum area.

Table 5. Estimated scale of company's activities risk areas

Risk magnitude probability	Risk reason area name
0	Risk free area
(0,01- 0,25)	Minimum risk area
(0,251 - 0,50)	Increased risk area
(0,51 - 0,75)	Crucial risk area
(0,751 - 1,00)	Unacceptable risk area

To estimate the membership degree of risk influence probability calculated value to the company's activities risk the following formula is used:

$$YCp = (Esp - Gmin) / (Gmax - Gmin)$$

Where YCp – impact compliance degree of p -reason on activities risk, Esp – estimated impact probability of p –reason on the risk , Gmin – minimum value of risk area, Gmax – maximum value of risk area.

The approbation of the model suggested by the authors of this article has shown that the YCp-index practical use allows to rank reason impact probability within the certain area on the risk level.

Discussions

Scientists from different countries pursue the issues of capital structure research, of the structure optimization and of recording of various factors influencing this structure. The works of E.O. Fischer, R. Heinkel & J. Zechner (1989), R.A. Damodaran (2004), R. Braley & S. Myers (2008), and also M.Z. Frank, & V.K. Goyal (2009) are the most famous in this sphere. In addition, these works are

focused on the estimation of the connection between the capital structure and cost of business. However, the research of the risk level estimation and of risk management implementation for company's capital structure optimization hasn't been made.

Some of the authors have already published results of the research related to the development of methodological approaches to identify risk levels due to capital structure formation in terms of instable economy (Petrovskaya et al., 2016). Another research is related to the applied aspect in respect to financial risk management strategic problems while building hotels (Dzhandzhugazova et al., 2015).

At the same time, the majority of questions related to estimation techniques development of various company's activities risks as well as to risk management based on risk reason identification and their impact on the capital structure are still underdeveloped.

Methodological approaches suggested by the authors to risk management implementation in order to optimize the company's capital structure contain certain novelty aspects and may cause scholarly dispute that may end up in research widening in this sphere.

Conclusion

Therefore, in conclusion it may be noted that despite the relevance of company's economical activity risk reason identification issues, relevance of the risk estimation level and its impact on the capital structure this line of research haven't been studied well yet.

Methodological approaches suggested by the authors to risk management implementation in order to optimize the company's capital structure will contribute to solution of this problem.

The authors have proved that one and the same basic reason may influence various basis risk changes. Therefore, the formation of the analyzed risks basic reasons appearance matrix was suggested to estimate such influence.

The described relationship model "risk-reason" allows to identify the most considerable each basic risk reason appearance and to estimate the appearance probability of each reason: "risk-reason" relationship matrix allows to identify a crucial reason that has the greatest influence on company's activities riskiness as well as to put the reasons in order of frequency of occurrence, and to set a rating of risk influence relevance on the company's activities' risk.

Utilization of methodological approaches to risk management implementation in order to optimize the company's capital structure permits to improve financial management quality that will inevitably influence the economic performance and competitiveness of the company.

Disclosure statement

No potential conflict of interest was reported by the authors.

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