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**Article**

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UTMS Journal of Economics

**Provided in Cooperation with:**

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*Suggested Citation:* Orsag, Silvije; Mitar, Josip (2014) : Application of cost of capital for capital structuring in Croatian firms, UTMS Journal of Economics, ISSN 1857-6982, University of Tourism and Management, Skopje, Vol. 5, Iss. 2, pp. 151-158

This Version is available at:

<https://hdl.handle.net/10419/105264>

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# APPLICATION OF COST OF CAPITAL FOR CAPITAL STRUCTURING IN CROATIAN FIRMS

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## Abstract

This paper show result of empirical analysis application of cost of capital for capital structuring in Croatian firms. Intensity of this applications is highly unrespectable because Croatian firms usually calculated cost of capital in their capital budgeting process. Analysis also show low inconsistency of Croatian firm's capital structures with peaking order theory. The paper shows that Croatian firm's employ debt in their capital structure close to the debt equity ratio 1:1, with the significant portion of trade credit and short term bank credits. This short term liabilities are greater than 60% of total used debt in analyzing firms. Finally, paper shows that with degree of using the cost of capital in capital structuring rise profitability of analyzing firms.

**Keywords:** cost of capital, capital structure, profitability, leverage.

*Jel Classification:* G32

## INTRODUCTION

Capital structure puzzle is one of the most controversial topics in finance. First theoretical discussion dated from the beginning of 1950s (Durand 1952) was upgraded with more realistic assumptions by Solomon (1963). Neoclassical theoretical approach on capital structure theory was brought by Nobel laureates Modigliani and Miller (1958, 1963 and 1969) whose approach was often called MM revolution. One of two main capital structure theories was developed based on MM approach to capital structure, the trade-off theory (Kraus and Litzenberger 1973). There are many other theoretical approaches to capital structure, as Miller (1977) extension of MM approach with taxes, agency problem approach based on Jensen and Mackling (1976) theory of the firm, information asymmetry approach (Orsag 2011), signaling theory (Akerlof 1970). Classical order of capital structure theory finished with second main theory, Myers (1984) and his peaking order theory, originally developed by Donaldson (1961)

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and popularized by Myers and Majluf (1984), based on managerial preferences according to sources of financing.

Although the trade-off theory is the empirical relevance, such as every other classical theory, it has often been questioned, when and where the management should take the cost of capital into account when establishing capital structure for own company. The trade-off is incorporated in the cost of capital between long-term investments and their financing in the companies and limitation of investment horizon of companies through marginal concept and their practical version, incremental cost of capita (Orsag and Dedi 2011). The cost of capital is main tool for capital budgeting decision and therefore is closely connected to the structure of financing companies of new and existing investment projects.

In the beginning of 1970s the capital budgeting, especially net present value and other techniques for project ranking came into focus of Croatian academic discussion in the field of business finances. As Croatian firms operated in a quasi-market environment this techniques were discussed without possibilities of the cost of capital establishment. Therefore the discount rate used for discounted net cash flows was determined with the interest rate with or without premium. It can be said that eliminating the cost of capital is the problem of practicing capital budgeting in Croatian companies during long period before transition process which is relatively highly developed (Orsag and Dedi 2008). After transition of Croatian economy and society which occurred in the early 1990s, Croatian companies began assessing the cost of capital as a discount rate for discounting net cash flows in their capital budgeting processes. In the first half of 1990s 76 of 100 surveyed shareholding firms calculated the cost of capital for their capital budgeting decisions, mostly as required rate of return (40) and by using CAPM (40) (Dedi and Orsag 2007). Although the possibilities for calculating the cost of capital as a required rate of return in emerging capital markets such as Croatian may be questionable, the fact is that high percentage of Croatian shareholding companies is calculating the cost of capital.

Starting from frequently used cost of capital in Croatian shareholding companies we shall try to investigate how much the Croatian managers take the cost of capital into account in capital structuring process and how much this practices help to improve performances of their companies. For the first question we expected frequently uses. For the second question we have much more reserve for helpfulness of this practice.

## **METHODOLOGY AND DATA SOURCES**

We investigated the intensity of using the cost of capital for capital structuring in Croatian shareholding companies with the questionnaire sent to 100 of 254 Croatian public shareholding companies. The sample of 100 firms was chosen randomly. The respond rate was 73%. This respond rate was unexpected, because the reject rate in Croatia is usually 62 to 73% (Bagic 2004). The sample of 73 companies with a positive response includes all Croatian regions and has representatives from all non-financial industries. This sample can be treated as representative one. For the purpose of this research we used just one of 15 questions in the above-mentioned questionnaire: how often do you use the cost of capital in your capital structuring process; with answers

ranging on Likert scale from 1 to 5, never (1), few (2), medium (3), mostly (4) and always (5).

For the purpose of more thorough testing of using the cost of capital in capital structuring we collected financial data for every of 73 companies in the sample. The source of data was FINA (Financijska agencija – Financial agency), with collection of legally financial statements structured according to the legal range and ZASE (Zagrebačka burza – Zagreb Stock Exchange), with collection of standard set of financial statements of publicly held companies. For the purpose of assessing quality of financial performances for all 73 companies in the sample we used two groups of financial ratios: profitability ratios and leverage ratios. Profitability ratios were chosen for assessing business efficiency of sampled companies and for assessment opportunity of employing leverage. For this purpose we used return on total asset (ROA) and return on equity (ROE). Leverage ratios were chosen for assessing intensity of employing leverage according to intensity of using the cost of capital in determining capital structure.

For the purpose of developing conclusion to this research, we used the statistical test, that is, the analyses of variance (ANOVA), using which we wanted to research the existence of connection between different levels of using cost of capital along with indicators of profitability and indebtedness in structuring of capital of Croatian companies. Based on such data, we shall deduce on correlation of said variances from the perspective of Croatian companies' success.

## **EMPIRICAL RESULTS**

The unexpected result of the research emerged from the questionnaire answers when asked about Croatian managers and their use of the cost of capital in their businesses, as the research showed that a very few of the companies from the sample use the cost of capital when deciding during capital structuring process. That is, 48% of the companies pointed out that they do not perform the cost of capital calculation at all when making financial decisions. Employing of the cost of capital when making financial decisions is as follows: 24, 66% of the companies pointed out a few (1), 8,22% medium (2), 9,59% mostly (4) and 9,59% always (5). Only companies with grades (4) and (5) use the cost of capital significantly in defining the structure of capital. The reliability of their answers was tested by a statistical measure named Cronbach's Alpha. Statistical testing was conducted by F test of 12,315 what is statistically significant with the Cronbach's Alpha of 0,96 of all descriptive data from the questionnaire. Arithmetic mean connected to calculation and use of calculated cost of capital is  $M=1,60$ , with standard deviation  $STDV=1,770$ . Low grade connected to using of the cost of capital indicates problems of capital structuring of the sampled companies. The questionnaire answers revealed the less satisfaction with achieved results in relation to the level of usage of cost of capital, indicating the relevance of knowledge emerging from the questionnaire in the further course of the analyses and in making final conclusions in capital structuring process in Croatian companies.

The analysis of using the cost of capital in capital structuring of Croatian companies we list the following: preferences of using the capital components through peaking order theory, the cost of capital effect on financial success and indebtedness of

companies and also the connection of different levels of use of the cost of capital and success indicators.

*Preferences of the capital use.* Analysis of financial reports showed that Croatian companies financed their businesses from: retained earnings, long-term and short-term liabilities (loans) and short-term liabilities toward suppliers, that is, trade loans as it is shown in Table 1 – Financial reports taken from FINA web pages (sample of 73 large of JDD of the Republic of Croatia).

**Table 1.** An average share of used components in %

Liability structure	Never (1)	Few (2)	Medium (3)	Mostly (4)	Always (5)	Rank
Retained earnings (non-reduced for transferred loss)	2,57	6,52	13,20	19,51	19,52	2
Long-term financial liabilities	14,82	12,68	12,62	11,33	13,61	1
Short-term financial liabilities	9,62	6,96	5,93	11,75	9,31	4
Long-term suppliers credits	0,00	0,00	0,00	0,00	0,00	5
Account payable (up to 360 days)	8,06	13,18	14,4	11,76	10,72	3
Total:	35,06	39,52	46,19	54,34	53,17	

According to the peaking order theory, the companies need to finance their businesses in this order: by retained earnings, low-risk indebtedness and high-risk debts. It is visible from Table 1 that Croatian companies do not finance their businesses in accordance with the peaking order theory because they employ much more riskier short term liabilities with high opportunity cost associated with account payable. Data from Table 1 also showed stability in capital structure firms from sample during analyzing period.

*Profitability ratios analysis.* The efficacy of sampled companies, based on degree of the cost of capital use when making financial decision, is shown with financial indicators in Table 2 (processed by the author using financial data provided by FINA).

**Table 2.** Average value of profitability ratios from the perspective of levels of using the cost of capital of JDD of the Republic of Croatia for the period from 2007–2011.

Financial indicators	all companies in the sample	newer (1)	few (2)	medium (3)	mostly (4)	always (5)
Profitability of own capital - ROE	2,66	-4,60	2,42	8,98	16,80	19,99
Profitability of total assets - ROA	1,40	-1,23	1,36	4,64	5,15	8,11

Average profitability ratios of the complete sample in the above-mentioned period are very low. As 48% of the companies do not found their capital structures on the cost of capital, in the most cases they realize negative profitability ratios, what is significantly reflected to the average value of profitability indicators of the complete sample. Researched companies, classified according to the level of their use of the cost of capital in capital structuring, do not always realize positive value of ROE and ROA indicators. Companies which do not base their capital structure on the cost of capital show negative value of the researched indicators. The highest value of profitability ratios is shown with the companies mostly relying on the cost of capital value. Companies' success increases with the higher level of using the cost of capital. According to data of ROE and ROA indicators we can say that the cost of capital value

and growing consistency of its use when accepting and rejecting the investment projects is the important tool in creating the success of the company.

*Leverage ratio analysis.* Degree of using debt according to the total of assets from the perspective of using the cost of capital is shown in table 3 (processed by the author using financial data provided by FINA).

**Table 3.** Average value of debt to total assets from the perspective of using the cost of capital of JDD of the Republic of Croatia for the period from 2007–2010.

Financial indicators	all companies in the sample	newer (1)	few (2)	medium (3)	mostly (4)	always (5)
Debt to total assets ratio	48,37	54,27	46,22	48,94	50,88	54,04

It can be seen in Table 3 that the complete sample shows for average use of equity to be for 3,26 percent points higher compared to the debt. Looking at the levels of using the cost of capital it appears that business subjects not leaning to the cost of capital use debt more than those companies which use the cost of capital. Indebtedness increases with the higher level of relying on the cost of capital, what is according to Table 2 reflecting to the profitability growth of the company, and vice versa. Indebtedness of those companies always relying on the cost of capital is almost identical to use of own capital by those companies not relying to the cost of capital.

An empirical analysis of the sample of Croatian companies indicates the advantages of employing financial leverage. Indicators of indebtedness (in the Table 4 — authors analysis of statistical data) were used to show the relation between the total debt and total assets. As in Croatian companies the short-term liabilities present significant source of financing, the short-term liabilities along with the long-term ones were used in calculation of said indicators.

**Table 4.** Average use of financial leverage from the perspective of level of using the cost of capital of JDD of the Republic of Croatia for period from 2007–2010.

Financial indicators	all companies in the sample	newer (1)	few (2)	medium (3)	mostly (4)	always (5)
Short-term debt / Total assets	30,73	27,48	30,75	33,91	40,21	40,52
Total debt / Total assets	48,37	45,73	46,22	48,94	60,88	63,05

Looking at the Table 4 we see that with the higher level of using the cost of capital the value of total debt and short-term debt increases constantly with regard to the total assets. Short-term indebtedness of the company through trade credits and bank loans (Croatian National Bank Bulletin) is especially high. Credit share in indebtedness is 97,74% in 2007, 99,56% in 2008, 99,83% in 2009, 100% in 2010 and 99,77% in 2011. It can be concluded from the above-stated that Croatian companies use high total leverage, especially the short-term one.

The aim of the empirical work is also to determine the connection of levels of using the cost of capital, that is, its' taking into account in doing businesses with success indicators for the complete sample during the above- mentioned time period.

Derived from statistical data (arithmetic means) the average use of the cost of capital in businesses of Croatian companies is 1,60 on Likert scale, with standard deviation ( $\delta$ ) of 1,770. This low level of taking the cost of capital into account in

decision making in Croatian companies is followed by low rates of ROE with  $(\delta) = 11,146$  and ROA with  $(\delta) = 3,867$ . Connection of the levels of use of the cost of capital with ROE and ROA indicators is shown by the table of correlation, that is, the bi-directional test with significance of 0,01.

Correlations				
		use the cost of capital	ROE	ROA
Pearson Correlation	use the cost of capital	1,000	0,768	0,806
	signif.	0,000	0,000	0,000
	covariance	3,132	15,151	5,514
Pearson Correlation	ROE	0,768	1,000	0,734
	signif.	0,000	0,000	0,000
	covariance	15,151	124,238	31,658
Pearson Correlation	ROA	0,806	0,734	1,000
	signif.	0,000	0,000	0,000
	covariance	5,514	31,658	14,956
St.Dev.		1,770	11,147	3,867
N		73	73	73

Correlation is significant at the 0.01 level (2-tailed)

Zero significance indicates extremely high importance of the above-stated data. These are positive correlation between stated variables, where increase of one variable follows the increase of the other. Looking at the table it can be seen that there exists a very good connection between using the cost of capital and ROE (0,768) and ROA (0,806) indicators of appropriate levels of use, and vice versa (Colton 1964). It can be said that average use of taking the cost of capital into account in 76,8% of cases follows the value of ROE and in 80,6% the value of ROA. In other words, higher level of using the cost of capital when making financial decisions is followed by higher realized values of ROE and ROA indicators.

**Table 5.** Connection of ROE and ROA with the cost of capital

	Direction correlations	Intensity correlations (%)
Cost of capital	0	100,0
ROE	+	76,8
ROA	+	80,6

It can be seen from the Table 5 (authors analysis of statistical data) that there is an average positive connection of strong intensity of profitability indicators (ROE and ROA) in relation to the level of using the cost of capital in performance of the sampled companies. In other words, realization of profitability is connected to the level of using the cost of capital to the maximum extent (constant variable) when making decisions and accepting or rejecting investment projects.

## CONCLUSION

Although the cost of capital is useful factor in creating the company value by realized success indicators, this research did not prove the extensive use of relying to the cost of capital in the Republic of Croatia for the analysed period of time. In capital structuring process for the period of time from 2007 to 2011 for the sampled JDD, we noticed the following:

- It is surprising that 48% of the companies do not take the cost of capital into account at all, while only 19,59 do it mostly and usually use the cost of capital when making decisions.
- Although are use of cost of capital in capital structuring is pure, Croatian company do not structuring their capital according peaking order theory, which result with using too much risky debt.
- Profitability of the complete sample is very low. That was significantly resulted by lower rate of using the cost of capital, because profitability ratios rise with rise of using cost of capital.
- Looking at the complete sample, the debt to equity ratio close to 1:1. Ineptness increase as increase the use of the cost of capital.
- Using financial leverage with any level of employing the cost of capital in making decisions has a tendency of progressive growth. It should be pointed out the significant representation of short-term loans.
- Statistical testing showed high level of connection between the using of the cost of capital and the ROE (76,8%) and ROA (80,6%) indicators. In this way the statistical method also showed the significant importance of relying to the cost of capital for the profitability of the company.

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