

# The impact of liquidity on the capital structure: a case study of Croatian firms

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## Abstract

**Background:** Previous studies have shown that in some countries, liquid assets increased leverage while in other countries liquid firms were more frequently financed by their own capital and therefore were less leveraged. **Objectives:** The aim of this paper is to investigate the impact of liquidity on the capital structure of Croatian firms. **Methods/Approach:** Pearson correlation coefficient is applied to the test on the relationship between liquidity ratios and debt ratios, the share of retained earnings to capital and liquidity ratios and the relationship between the structure of current assets and leverage. **Results:** A survey has been conducted on a sample of 1058 Croatian firms. There are statistically significant correlations between liquidity ratios and leverage ratios. Also, there are statistically significant correlations between leverage ratios and the structure of current assets. The relationship between liquidity ratios and the short-term leverage is stronger than between liquidity ratios and the long-term leverage. **Conclusions:** The more liquid assets firms have, the less they are leveraged. Long-term leveraged firms are more liquid. Increasing inventory levels leads to an increase in leverage. Furthermore, increasing the cash in current assets leads to a reduction in the short-term and the long-term leverage.

**Keywords:** liquidity, capital structure, leverage

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## Introduction

Capital structure refers to the way a firm is financing its assets through a combination of equity and debt (Titman and Wessels, 1988). It can be measured as the ratio between debt and total of equity and liabilities (Myers, 2001). The form of financing and types of funding sources will define the firms' capital structure. The process of financing takes a very important place in firms' management because it must ensure financial continuity necessary for growth and maintaining competitiveness in their environment.

Funding is the process of acquiring, using and returning funds to their sources. If income, derived from the use of debt, is greater than the cost of capital, then it can be said that using debt is a good financial decision. However, it still remains an open question whether it is better to use internal sources of financing (cash, dividends, unpaid taxes etc.) or to use external sources and pay for compensation in the form of interest rates. The issue of vertical financial structure remains open both for managers and for theorists, because it is relatively difficult to make a decision about the optimal mode of financing with regard to dynamic business changes, but also those of the institutional and legislative. Access to external funding is generally easier for liquid firms whose financial ratios correspond to the criteria of financial institutions.

Liquidity is a property of the assets to be converted into cash. Firms in their operations seek to maintain liquidity, or ability to timely perform its obligations. Liquidity ratios compare current liabilities with current

resources available to meet current liabilities. The capital structure is a form of leverage or debt ratio measures (Zingales and Rajan, 1995).

Leverage ratios show the ways in which a firm finances its assets. They represent a measure of the degree of investment risk in the firm, and determine the degree of use of borrowed funds. Firms with significantly high levels of debt are losing financial flexibility, may have problems in finding new investors, and are faced with the risk of bankruptcy. However, debt is not necessarily bad. If the level of debt is under control and regularly monitored through time, and borrowed funds are used properly, debt can result in increased return on investment. A liquid firm is one that promptly pays all its obligations and as such is desirable for funding sources.

### *Relationship between leverage and liquidity*

Williamson (1988) argued that the optimal level of debt of the firm is limited by the liquidity of the assets and it depends on the average usage of the debt in the particular industry. According to Morallec (2001) the importance of liquid assets is conditioned by the value of its assessment – whether the value of liquid assets is measured by the liquidation value of the firm's assets or by the selling price of assets over the entire life of the firm. Sibilkov (2004) in her study, which was based on a sample of U.S. public companies, came to the conclusion that liquid assets increased leverage and debt of the companies. According to this finding, it can be concluded that firms with more liquid and thus reversible assets, are more leveraged. If such firms are not able to repay its current liabilities, they are safe obligors because they have enough liquid assets that can cover the arrears. Lipson and Mortal (2009) in their research showed that more liquid firms are more financed by its internal resources and are therefore less leveraged. The sample for their research consisted of the U.S. companies listed on stock exchanges with the value of assets over \$ 1 million. Anderson (2002) has proved in his research on British companies the relationship between high leverage, high liquidity and slower growth of the firm.

Since such kind of research that would find relationship between leverage and liquidity hasn't been conducted in Croatia, our aim with this research is to fill the gap. Can it be expected that the liquid firms in Croatia borrow less and finance themselves more by using the internal funds or in Croatia, the trend is reversed, as the firm is more liquid, its access to financial markets is easier and therefore it is more leveraged?

Based on the discussion above, two hypotheses were stated: (i) there is a statistically significant relationship between the liquidity ratios and leverage ratios, (ii) there is a statistically significant relationship between the structure of current assets and leverage ratios.

### *Relationship between short-term and long-term leverage and liquidity*

According to Anderson (2002) firms with high liquid assets prefer high degree of long-term leverage without changing the structure of their liquid assets. Liquid assets is a guarantee that in times of lower earnings, or when it is difficult for a company to get financed on the capital market, or when the cost of capital is extremely high, can survive such situations. Such firms will avoid riskier projects that might bring them higher profit and for that reason growth of the company will be slower. Anderson (2002) has also showed the positive relationship between long-term debt and liquid assets of the company. It can be explained with the precautionary motive in holding the liquid assets for the company with high leverage long-term characteristics of its capital structure. He also demonstrated a negative relationship between short-term borrowings and liquid assets of the company, assuming that each other are substitute in times of lack of cash. When he tested the same relationships on the sample of Belgian companies, he got surprising results in comparison to the British one. 25% of Belgian companies hold at least 23% of their assets in liquid form, while the same percentage of assets in liquid form for the British companies is 14%. In the Belgian companies there is a positive relationship between short-term debt and liquid assets, while the relationship between long-term debt and liquid assets is negative. Akdal (2010) has demonstrated, on a sample of British companies listed on stock exchanges, through all five measures of leverage, negative relationship between liquidity and leverage of the firms.

All of the contrasts in the results showed in previous studies were the motivation for this research where the aim was also to examine the relationship between liquidity and short-term and long-term leverage. In order to derive conclusions about it, three additional hypotheses are tested on the sample of Croatian firms: (iii) there is a statistically significant relationship between liquidity and long-term and short-term leverage, (iv) there is a statistically significant relationship between the structures of current assets and long-term and short-term leverage: (v) there is a statistically significant relationship between liquidity and the ratio of retained earnings and equity in the capital.

After the introduction where the previous studies are described and the hypotheses are given, the remainder of this paper is the description of the methodology that includes a description of data and variables, and methods applied in the research, after which the results, discussion and conclusion are given.

## Methodology

For purposes of this research a data sample consisting of Croatian firms was selected. The sample contains small and medium-sized enterprises as defined in the Accounting Law. They are randomly selected from the database of Financial Agency. The sample is consisted of 1100 firms, and during the analysis 42 firms were removed from the sample due to missing data, outliers or errors in the input. There are 96,5% of small and 3,5% of medium-sized firms in the sample. Distribution of firms in the sample according to the industry sector is the following: 2,24% agriculture, 13,47% production industry, 9,76% construction, 37,28% trade, 4,62% hotels, 5,44% transport, 22,23% finance, 4,96% public administration.

For firms in the sample financial ratios for year 2009 were available. Descriptive statistics (mean, standard deviation) of the used ratios are given in Table 1. Numbers in 'mean' column represent mean values of each ratio calculated for all 1058 firms in the sample, and numbers in 'standard deviation' column represent standard deviation values of each ratio calculated for all 1058 firms in the sample. In order to examine the relationships between variables and to test the hypotheses set out in the study, Pearson correlation coefficient which determines the degree to which two variables covary, is used (Sheskin, 2004, pp. 945).

Table 1  
Descriptive Statistics of Financial Ratios Used in the Research

Ratio	Ratio calculation	Mean	Standard deviation
Liquidity ratios			
Current ratio	current assets/ current liabilities	1,026	0,545
Quick ratio	(current assets -inventory)/current liabilities	0,741	2,096
Cash ratio	cash/ current liabilities	0,079	0,089
Stucture of current assets			
Cash to current assets	cash/current assets	0,197	0,261
Inventory to current assets	inventory/current assets	0,215	0,276
Financial assets to current assets	financial assets/current assets	0,077	0,190
Leverage ratios			
Debt ratio	total debt/total assets	0,630	0,314
Debt to equity ratio	total debt/total equity	1,671	1,412
Debt factor	total debt/ (retained earnings+depreciation)	4,458	4,489
Long-term debt ratio	long-term debt/total assets	0,108	0,196
Short-term debt ratio	short-term debt/total assets	0,522	0,317
Retained earnings to capital	retained earnings/capital	0,651	1,244
Equity to capital	equity/capital	5,873	148,143

Source: Authors' calculation

## Results

### *The relationship between liquidity and leverage*

In order to examine the relationship between liquidity and leverage, correlation coefficients between the liquidity ratios and leverage ratios are calculated. The aim is to examine whether high liquidity means less leverage or vice versa. Results are presented in table 2.

Table 2  
The Correlation Coefficients between Liquidity Ratios and Leverage Ratios

	Debt ratio	Debt to equity ratio	Debt factor
<b>Current ratio</b>	-0,3865* (0,000)	-0,1082* (0,000)	-0,1957* (0,000)
<b>Quick ratio</b>	-0,3574* (0,000)	-0,093* (0,002)	-0,2205* (0,000)
<b>Cash ratio</b>	-0,2097* (0,000)	-0,0898* (0,003)	-0,1331* (0,000)

Note: Figures in parenthesis indicate statistical significance of the correlation coefficient

\* statistically significant at 5%

\*\* statistically significant at 10%

Source: Authors' calculation

From table 2, it can be concluded that there is a statistically significant negative correlation between the current ratio and debt ratios by which the first hypothesis is confirmed. As the ratio of current assets to current liabilities increases, debt ratio decreases. The more liquid the firm is, it is the less leveraged. There is also a statistically significant correlation between the current ratio and the debt to equity ratio, which implies that an increase in liquidity reduces the debt to equity ratio, or reduces the leverage of the firm. Debt factor in relation to the current ratio also showed a statistically significant correlation, and indicates that the higher the ratio of total liabilities to retained earnings and depreciation, the lower the liquidity of the firm. If the inventory is removed from the current assets, there will be no changes in the correlation between liquidity and the ratio of total liabilities to total assets, and liquidity of the company will not be distorted. However, with the increase of cash ratio, there is a reduction of indebtedness and the leverage is reduced. The increase of debt to equity ratio as well as the increase of debt factor will lead to reduced liquidity in the firm also in the case when the inventory is removed from the current assets. These figures show a negative relationship between liquidity and capital structure. The higher proportion of liquid assets in the firm, the firm is less leveraged.

### *The relationship between the current assets structure and leverage ratios*

To further investigate the relationship between liquidity and leverage, the research examines the correlation between the structure of current assets and debt ratios. The results are shown in table 3.

Table 3  
The Correlation Coefficients between the Structure of Current assets and Leverage ratios

	Debt ratio	Debt to equity ratio	Debt factor
<b>Cash to current assets</b>	-0,1879* (0,000)	-0,1574* (0,000)	-0,1278* (0,000)
<b>Inventory to current assets</b>	0,1552* (0,000)	0,1205* (0,000)	0,1457* (0,000)
<b>Financial assets to current assets</b>	-0,0332 (0,282)	-0,0201 (0,515)	-0,0150 (0,628)

Note: Figures in parenthesis indicate statistical significance of the correlation coefficient

\* statistically significant at 5%

\*\* statistically significant at 10%

Source: Authors' calculation

Results presented in table 3 show that there is a statistically significant correlation between the structure of current assets and leverage by which the second hypothesis is confirmed. When a firm increases the share of cash in current assets, it reduces its debt regardless of whether it is manifested through the ratio of total liabilities to total assets, total liabilities and capital, or the ratio of total liabilities and retained earnings plus depreciation. Increasing the share of cash in current assets results in decreasing of debt ratio which means that the more liquid assets the firm has, the less it is leveraged, regardless of whether leverage is measured by debt ratio, debt to equity ratio or debt factor. However, increasing the share of inventories

in current assets results in increasing of the firm leverage, no matter how you measure the leverage. There is a statistically significant positive correlation between the proportion of inventories in current assets and leverage of the firm. Since the inventory is illiquid assets, these indicators suggest that the increase in illiquid assets results in increase of firm leverage. Financial assets and debt ratios showed no statistically significant correlation.

### *The relationship between liquidity and long-term and short-term leverage*

Given that the results showed that there is a relationship between liquidity and leverage, the following research objective is to examine whether there is a correlation in the case when considering a long-term debt and short term. Results are shown in table 4.

Table 4  
The Correlation Coefficients between Liquidity and Long-term and Short-term Leverage

	Long-term debt ratio	Short-term debt ratio
<b>Current ratio</b>	0,0548** (0,075)	-0,4176* (0,000)
<b>Quick ratio</b>	0,0374 (0,225)	-0,3780* (0,000)
<b>Cash ratio</b>	-0,0137 (0,656)	-0,1997* (0,000)

Note: Figures in parenthesis indicate statistical significance of the correlation coefficient

\* statistically significant at 5%

\*\* statistically significant at 10%

Source: Authors' calculation

From table 4 can be concluded that there is a statistically significant correlation between the indicators of liquidity and short-term leverage. By increasing the ratio of current assets to current liabilities, short-term leverage will be decreased. This could mean that there is an increase of cash and receivables in relation to current liabilities. In such situation, there is no need for a short-term borrowing since a firm can pay its obligations from its current assets. If inventory is excluded from the current assets, the situation remains unchanged. Increasing the cash ratio also leads to reduced short-term leverage, and such a correlation is statistically significant and logical. The higher cash ratio also leads to lower long-term leverage, although it is not statistically significant. These results indicate that liquidity is more affected by the short-term debt than long-term debt. These results partly confirmed our third hypothesis because statistically significant correlation is found only between current ratio and long term debt while quick and cash ratio is not correlated to long-term debt.

### *The relationship between the current assets structure and long-term and short-term leverage*

In order to examine how the structure of current assets influence long-term as well as short-term leverage of the firm, the correlation coefficients are calculated and shown in table 5.

Table 5  
The Correlation Coefficients between the Current Assets Structure and Long-term and Short-term Leverage

	Long-term debt ratio	Short-term debt ratio
<b>Cash to current assets</b>	-0,0777* (0,012)	-0,1385* (0,000)
<b>Inventory to current assets</b>	0,0761* (0,014)	0,1070* (0,001)
<b>Financial asetes to current assets</b>	0,0217 (0,483)	-0,0466 (0,131)

Note: Figures in parenthesis indicate statistical significance of the correlation coefficient

\* statistically significant at 5%

\*\* statistically significant at 10%

Source: Authors' calculation

Results presented in table 5 show that there is a statistically significant correlation between the structure of current assets and long-term and short-term debt ratios by which our fourth hypothesis is confirmed. Increasing the share of cash in current assets leads to decreasing of long-term as well as short-term leverage. However, the increase of inventories in current assets leads to an increase in both types of leverage. These results indicate that the firms with more liquid assets are less leveraged.

### *The relationship between liquidity and retained earnings to capital*

In order to examine the relationship between liquidity and retained earnings to capital and also between liquidity and equity to capital, correlation coefficients are calculated and presented in table 6.

Table 6

The Correlation Coefficients between Liquidity and Retained Earning to Capital and Equity to Capital

	Retained earnings to capital	Equity to capital
<b>Current ratio</b>	-0,0219 (0,523)	-0,0152 (0,658)
<b>Quick ratio</b>	-0,0573** (0,095)	-0,0114 (0,739)
<b>Cash ratio</b>	-0,0549 (0,109)	-0,0049 (0,887)

Note: Figures in parenthesis indicate statistical significance of the correlation coefficient

\* statistically significant at 5%

\*\* statistically significant at 10%

Source: Authors' calculation

Share of retained earnings in capital is not significantly correlated with any indicator of liquidity. Also, neither the equity to capital is correlated with the liquidity of the firm. Although the correlation is not statistically significant, it can be noticed that increase in retained earnings in capital reduces the current ratio. The same applies if inventory is removed from the current assets. Increase of the cash ratio leads to reduction of retained earnings to capital which means that less amount of money will retain for the firm that reduces its obligation but in that case the firm will be more liquid. This means that liquid firms have less retained earnings to capital in order to maintain its liquidity by its future profit. These results show that our fifth hypothesis about significant correlation between liquidity and equity is not confirmed.

## Discussion and Conclusion

Previous studies that were investigating the impact of liquidity on the capital structure of the firms showed that in some countries liquid assets increases leverage of the firms while in some countries the more liquid firms are more financed with its own capital and therefore less leveraged as Lipson and Mortal (2009) showed in their research based on American companies.

The aim of this paper was to investigate the impact of liquidity on the capital structure of Croatian firms. The results of this research show that there is a negative relationship between liquidity and capital structure, which is in contrast with American companies from previous studies (Sibilkov, 2007), but supports Akdal's findings on a sample of British companies which demonstrated negative relationship between liquidity and leverage of the firms. These results confirmed our first and third hypotheses about statistically significant correlations between liquidity and leverage. There is also a negative relationship, between the ratio of money in current assets and short-term leverage. Money, as the most liquid form of assets has a significant role in financing. The greater the amount of money, the less is a firm's leverage. It uses its working capital to finance its obligations. In this way a firm maintains the liquidity and provides sources of financing in case of sudden need. This conclusion supports Anderson's research on British companies which demonstrated a negative relationship between short-term borrowings and liquid assets of the company. Long-term leveraged firms are more liquid, assuming that managers or business owners are not inclined to risky projects and short-term borrowing that will reduce liquidity of the firms. Increasing inventory levels leads to increase of leverage, assuming that firms borrow in order to increase supply, which means that the Croatian entrepreneurs borrow in order to buy raw materials or finished products for further reproduction. This can trigger a negative trend, as the increase in illiquid assets reduces liquidity. It is therefore important to make a smart decision about short-term leverage in order not to jeopardize the business operations

and liquidity and in the long term take care of the financial stability of the firm. For this reason finance maturity should be respected, short-term assets should be financed by short-term funds and fixed assets should be financed from long-term funds. These results confirmed our second and fourth hypotheses about statistically significant correlations between structure of the current assets and leverage. Concerning our fifth hypothesis where we tested for the correlation between liquidity and retained earnings to capital and equity to capital, the results showed that it couldn't be confirmed which means that the share of retained earnings as well as equity to capital is not correlated with liquidity.

The results of this research showed that the liquidity of the company, which is reflected in the ongoing ability to pay financial obligations, affects the firm's capital structure. The increase of liquidity of the firm leads to decrease of the leverage and vice versa. It is important to emphasize the importance and role of money in the liquidity. Money or its cash equivalent, which are used for paying obligations, seems to be the best indicator of liquidity for Croatian firms. In comparison to other current assets (inventories, receivables and short-term financial assets), money is a scarce resource. In order to maintain liquidity, and thereby influence on the capital, entrepreneurs must be aware of the importance of managing liquid assets. However, can the results from this research be applied to all industry sectors? Does the inventory in sectors such as financial or real estate influence to leverage in the same way as in the construction sector? Does the size of the firm matter? What is the influence of receivables on leverage? These are some questions that should be used as guidelines for further research.

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