

LIQUIDITY AND CAPITAL STRUCTURE: SPECIAL REFERENCE TO MANUFACTURING SECTOR IN THE COLOMBO STOCK MARKET

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Abstract

The aim of the research is to investigate the association between capital structure and liquidity of listed manufacturing sector in Sri Lanka. Data was gathered from annual reports of 37 manufacturing companies listed in the Colombo stock exchange during 2009 to 2016. It was analysed using panel data fixed effect models. The results show that all liquidity ratios namely: Current, Cash and Quick are significantly negatively associated with capital structure and liquidity ratio is also insignificantly negatively associated with capital structure. Therefore, we could conclude that there is a negative relationship between liquidity and capital structure among the manufacturing companies in Sri Lanka. Further, it was found that size of the firms is significantly negatively associated with capital structure while Profit and Non-Debt Tax Shield are significantly positively associated with capital structure. There is no any significant relationship between tangibility and capital structure.

Keywords: Capital structure, Liquidity, Profit, Tangibility, Size, Non-Debt Tax Shield
JEL classification: G12; G32

Introduction

In the corporate finance, the decision on the capital structure and its components are viewed as one of the most extensively researched area. Capital structure consists of the methods by which the companies finance their assets via a combination of debt and equity (Titman & Wessels, 1988). Capital structure refers to the way a firm is financing its assets through a combination of equity and debt. It can be measured as the ratio between debt and total of equity and liabilities. (Kajanathan, 2012; Sarlija and Harc, 2012). Capital structure policies have the underlying purpose of maximizing the worth of a company (Ross, 1977). Any occurrences that could accumulate needless costs (such as liquidation) compel firms to deviate from achieving the aforementioned purpose (Bradley, Jarrell, & Kim, 1984).

On the other hand, Liquidity management is vital for firms, where a major part of the assets is composed of current assets. It directly affects the profitability of the firms.

Lipson and Mortal (2009) examine the relation between equity market liquidity and capital structure. They found that firms with more liquid equity have lower leverage and prefer equity financing when raising capital. Also profitability liquidity tradeoff is important because if working capital management is not given due consideration then firms are likely to fail and face bankruptcy (Raheman, Afza, Qayyum and Ahmed bodla, 2010; Raheman and Nasr, 2007). Liquidity is a trait of the company's assets to be quickly converted into cash. Companies in their operations try to sustain liquidity, or capability to timely do their obligations (Sarlija & Harc, 2012). Therefore, management of liquidity is very essential for every company to pay existing obligations on business, the obligations of payment consist of financial and operating expenses that are short-term (ST) debt maturity (Saleem & Rehman, 2011).

The decision on the capital structure is the complex. It means, on what basis, the debt

and equity should be utilized to get the profit in terms of the return on assets or equity. Meantime, survival is also depending on the capital structure decision. Further, in the income perspective, 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 or to use external sources and pay for compensation in the form of interest rates (Sarlija and Hanc, 2012). Based on the above arguments, the question is, what extent the liquidity influences on capital structure of manufacturing firms in Sri Lanka?

Therefore, the objective of this research is to examine how liquidity effects on the selected company's leverage. It has become one of major research area due to the people attraction on it. People want to aware the market structure, market leaders and the predictions of future market trends. So the results of this study are given more benefits to investors, shareholders and external users. This awareness makes a successful financial performance and increases the positive expectations throughout the field. The empirical findings from this research would provide insight into the liquidity management practices in the listed firms in Sri Lanka.

The rest of paper is organized as follows: Section 2 summaries the literature review. Section 3 describes the data and methodology. Section 4 presents empirical evidence of the study. Section 5 concludes the research.

Literature Review

Capital structure refers to the way a firm is financing its assets through a combination of equity and debt. It can be measured as the ratio between debt and total of equity and liabilities. Knowledge about capital structure is important, and a wrong decision about capital structure may cause financial distress and eventually bankruptcy. Moreover, Sarlija and Hanc (2012) express that firms that have too high degree of debt may lose its flexibility

and create problems in attracting investors. 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.

Liquidity is cash or other short-term assets that easily can be transformed into cash without partly losing the value in the assets in form of conversion costs. Money is the most liquid form of assets and cash has a prominent role in financing. 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.

Prem Prasad Silwal (2016) Asset Liquidity and Capital Structure: Empirical Evidence from Nepal has been carried out on asset liquidity and capital structure in the Nepalese non-financial listed firms from 2005 to 2014. The study is based on pooled cross-sectional data of 18 firms whose securities are traded in Nepal Stock exchanges. Multivariate regression analysis is employed to answer the research question as to what extent liquidity influences on capital structure. Out of the six examined independent variables – liquidity,

firm size, market to book, asset tangibility, profitability and non-debt tax shield – four of them- liquidity, firm size, market to book, and profitability are economically and statistically significant determinants of capital structure. The result shows that liquidity index is positively associated with leverage.

Based on the Liquidity and Capital Structure: The Case of Thailand (Udomsirikul et.al., 2011) states that firms who are possessing with more liquid equity experience a lower cost of equity and may be more edge on to adopt more equity and less debt in their capital structure and further the empirical evidence of this research has exhibited that an inverse relationship between liquidity and leverage. The results of this research were more interesting since it has focused on Thai firms where with more liquid equity and are significantly less leveraged than comparing with U.S market.

Based on some prior studies have demonstrated that in some countries, asset liquidity increased debt level while in other countries liquid companies were less leveraged and more regularly financed by their own capital. The study of Liquidity on the capital structure among 300 listed companies in the main market of Bursa Malaysia from 2005 to 2013 all the measures of liquidity have significant impact on all the proxies of leverage. Based on the results, Quick ratio has a positive effect on leverage; although current ratio is negatively related to leverage. Moreover, short term debt is more influenced by liquidity compared to long-term debt.

Sarlija and Harc (2012) argues that by concerning with previous studies it has shown that some countries liquidity assets increased leverage while in other countries liquid firms were more frequently financed by their own capital and therefore were less leveraged. The survey has been conducted on a sample of 1058 Croatian firms to investigate the impact of liquidity on the

capital structure. The findings have stated that more liquid assets firms were less leveraged and long term leveraged firms were more liquid. Increasing of inventory levels leads to an increase in leverage and further, increasing the cash in current assets leads to a reduction in the short term and long-term leverage.

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) concluded that liquid assets increased leverage and debt of the companies. According to this finding 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. 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.

The starting point in the modern theory of capital structure is the publication by Modigliani and Miller in the year 1958. The main conclusion from this paper was that the value of a company is independent on its capital structure, also known as the "capital structure irrelevance". This conclusion was however based on the assumption that firms act in a perfect market, in which Modigliani and Miller assume that "individuals can borrow and lend at the risk-free rate and there are only two types of finance which is risk-free debt and risky equity". Silwal (2016) investigated the Asset Liquidity and Capital Structure: Empirical Evidence from Nepal. This study has been carried out on asset liquidity and capital structure in the Nepalese

non-financial listed firms from 2005 to 2014. The results of this study show that liquidity index is positively associated with leverage. Jahfer (2009) found that profitability and growth are negatively related with capital structure and also longer-term debt is relatively lower than equity finance in the Colombo stock market.

From the above literature survey, it is clear that there is a relationship between liquidity and capital structure which encourages us to examine the relationship between liquidity and capital structure among manufacturing firms in Sri Lanka.

Data and Methodology

Data Collection

Data for this study was extracted from annual reports of 37 Manufacturing companies listed in the Colombo Stock Exchange over the period 2010-2016. Manufacturing sector is the largest sector among the 20 sectors listed in the Colombo stock exchange. Therefore, manufacturing sector was taken into consideration as it plays the key role in the economy.

In order to examine the relationship, the relationship total debt to total assets (DTA) is used as a proxy for determining the capital structure of the firms which is the depended variable. Liquidity of the firm as independent variable of the research has been calculated by using of ratios namely; current ratio (CR), quick ratio (QR), liquidity ratio (LR) and cash ratio (CASH). Current ratio is defined as current assets to current liabilities. Quick ratio is calculated as current assets minus inventory to current liabilities. Liquidity ratio is calculated as sum of cash in hand and short-term assets divided by current liabilities. Cash ratio is defined as cash in hand to current liabilities. In addition to these the moderating variables namely size, profit, tangibility and non-debt tax shield are used Size is defined as the natural logarithm of total assets. Profit is the ratio of earnings before interest and tax to total assets.

Tangibility has been calculated by dividing property plant and equipment over total assets. Non-debt tax shield (NDTS) is calculated as depreciation to total assets. Gibson Hosea Munisi (2017) find that capital structure is negatively associated with profitability and tangible assets, which is supported by the pecking-order theory and the trade-off theory while capital structure is positively associated with free cash and firms' growth in consistent with the agency theory and the pecking-order theory. Naseem and Nitya (2016) studied the variables influencing capital structure of firms suggest that profitability, non-debt tax shield, growth opportunity, liquidity and age of firm are negative and significant whereas size, assets tangibility is positive significant impact on the capital structure of firms

Conceptual Framework

Conceptualization is the process of giving clear idea and precise meaning and accepted definition to various concepts and variables used in the area of research undertaken. Figure 1 presents conceptual framework.

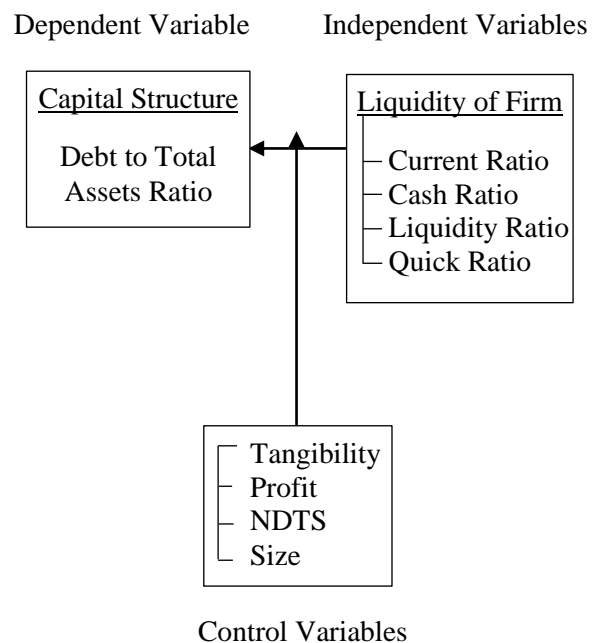


Figure.1

Models

The Following models are regressed:

$$\text{Lev}_{it} = \beta_0 + \beta_1 \text{CR}_{it} + \beta_2 \text{LSIZE}_{it} + \beta_3 \text{NDTS}_{it} + \beta_4 \text{PROFIT}_{it} + \beta_5 \text{TANG}_{it} + \varepsilon_{it} \dots\dots\dots (1)$$

$$\text{Lev}_{it} = \beta_0 + \beta_1 \text{QR}_{it} + \beta_2 \text{LSIZE}_{it} + \beta_3 \text{NDTS}_{it} + \beta_4 \text{PROFIT}_{it} + \beta_5 \text{TANG}_{it} + \varepsilon_{it} \dots\dots\dots (2)$$

$$\text{Lev}_{it} = \beta_0 + \beta_1 \text{LR}_{it} + \beta_2 \text{LSIZE}_{it} + \beta_3 \text{NDTS}_{it} + \beta_4 \text{PROFIT}_{it} + \beta_5 \text{TANG}_{it} + \varepsilon_{it} \dots\dots\dots (3)$$

$$\text{Lev}_{it} = \beta_0 + \beta_1 \text{CASH}_{it} + \beta_2 \text{LSIZE}_{it} + \beta_3 \text{NDTS}_{it} + \beta_4 \text{PROFIT}_{it} + \beta_5 \text{TANG}_{it} + \varepsilon_{it} \dots\dots\dots (4)$$

Where;

- Lev = Total Debt / Total Assets.
- CR = Current Assets / Current Liabilities
- QR = Current Assets-Inventory/Current Liabilities
- LR = Sum of cash in hand and short-term Liabilities/ Current Liabilities
- CASH = Cash in hand / Current Liabilities
- Size = Natural logarithm of total assets.
- PROFIT = Earnings before interest and tax/ total assets.
- TANG = Property Plant and Equipment / Total Assets.
- NDTS = Depreciation/Total Assets
- ε_{it} = Error

Empirical Results

Descriptive Analysis

Table 1 presents the summary statistics of selected ratios of the variables employed in this study. The mean (median) value of leverage of sample firms is 0.48 (0.41) whereas its minimum and maximum values are 0.00 and 7.24 respectively. It indicates

that Sri Lankan Manufacturing firms have 48% debt employed in their total assets. The minimum value of Current ratio is 0.13 and maximum value is 33.02. Mean value is 2.20 and standard deviation is 2.76. Mean value of current ratio represent the average value of current assets available for settle the current liabilities in Sri Lankan manufacturing firms. Quick ratio of manufacturing firms expand from minimum value of 0.087 to maximum value of 33.02. Its mean value is 1.377 and standard deviation is 2.34. Minimum and maximum figures for CR are relatively close to that of QR which reveals selected firms did not have a large amount of inventory. In Table 1, the peak of QR (33.02) indicates that a firm with a lot of cash (high QR) has tied up likely in non-productive asset condition. Nevertheless, high CR (33.02) is not constantly good as it indicates the excess amount of inventory or marketable securities or cash. The minimum liquidity ratio is 0.00 and maximum is 19.19 have been observed in the manufacturing firms and on an average these firms have 0.53 liquidity ratio. Minimum value of cash ratio is 0.00 and maximum value is 7.03. Average cash ratio is 0.37 and standard deviation is 0.86.

The Profitability of the sample firm ranges from minimum -0.80 per cent to maximum 1.47 per cent with average 7.87 per cent. The

Table 1. Descriptive Statistics

	Number of Observations	Mean	Median	Maximum	Minimum	Std. Dev.
Leverage (LEV)	234	0.48	0.41	7.24	0.00	0.58
Current Ratio (CR)	234	2.21	1.57	33.03	0.13	2.77
Quick Ratio (QR)	234	1.38	0.92	33.03	0.09	2.34
Liquidity Ratio (LR)	234	0.53	0.12	19.19	0.00	1.57
Cash Ratio (CASH)	234	0.37	0.08	7.03	0.00	0.86
Size (LSIZE)	234	9.21	9.12	10.34	7.56	0.49
Non-Debt Tax Shield (NDTS)	234	0.24	0.14	3.21	0.00	0.3
Profit	234	0.08	0.07	1.47	-0.80	0.81
Tangibility (TANG)	234	0.34	0.3	2.05	0.00	0.31

Notes: Debt/Total Assets Ratio is measured by Total Debt/Total Assets. Current Ratio is defined as (Current Assets/Current Liabilities). Quick Ratio is (Current Assets-Inventory/Current Liabilities) Liquidity Ratio is sum of cash in hand and short- term Liabilities divided by Current Liabilities. Cash ratio is defined as (Cash in hand/Current Liabilities). Size is defined as the natural logarithm of Total Assets. Profit is the ratio of earnings before interest and tax to total assets. Tangibility has been calculated by dividing Property Plant and Equipment Over Total Assets. Non-Debt Tax Shield is defined as (Depreciation/Total Assets)

table 1 also reveals that the range of log of assets from 7.56 to 10.33 with average of 9.20 million and standard deviation of 0.49 million. The tangibility of the sample firm ranges from minimum 0.00 per cent to maximum 2.05 per cent with average of 34.0 per cent. Similarly, non-debt tax shield has mean value of 23.53 per cent and standard deviation of 30.36 per cent with minimum to maximum range of 0.00 per cent to 3.21 per cent.

Correlation Analysis

Correlation measures the strength and the direct relationship of the variables in this study. Table 2 presents coefficient of correlation between variables included in the study. Based on the correlation analysis results of debt to total assets ratio is negatively correlated with current ratio (-0.199), quick ratio (-0.149), liquidity ratio (-0.092) and cash ratio (-0.153). So, it can be stated that liquidity ratios have significantly negative effect on the debt to total asset ratio. Once the current ratio decreases debt ratio increase. The more liquid firm is less leveraged. If the inventory is removed from

the current assets there will be no changes in the correlation between liquidity and leverage and liquidity of the company will not be distorted. When increasing the cash ratio, it has again decreased the leverage of firms. So based on the results it can be concluded that the higher proportion of liquid assets in the firm is less leveraged in consistent with Sarlija and Martina (2012).

Other than liquidity, the literature has identified a number of factors that influence leverage. In this study we have concerned four variables; Firm Size (LSIZE), Non-Debt Tax Field (NDTS), Profitability (Profit), Tangibility (TANG). Based on the correlation results, Profitability (0.168), Non-Debt Tax Shield (0.554), Tangibility (0.087) have positively correlated with capital structure while the firm size (-0.104) is negatively correlated.

Regression Analysis

In order to see the relationship between capital structure and liquidity, it was regressed using panel ordinary least squares method and fixed affect model in line with

Table 2. Pearson Correlation Coefficient

	LEV	CR	QR	LR	CASH	LSIZE	NDTS	PROFIT	TANG
LEV	1								
CR	-0.199 (0.002)	1.000 -----							
QR	-0.149 (0.023)	0.923 (0.000)	1.000 -----						
LR	-0.092 (0.160)	0.291 (0.000)	0.204 (0.002)	1.000 -----					
CASH	-0.153 (0.019)	0.556 (0.000)	0.372 (0.000)	0.511 (0.000)	1.000 -----				
LSIZE	-0.104 (0.114)	-0.197 (0.003)	-0.141 (0.003)	-0.051 (0.439)	-0.240 (0.000)	1.000 -----			
NDTS	0.554 (0.000)	0.028 (0.672)	-0.033 (0.617)	-0.001 (0.984)	0.058 (0.381)	-0.075 (0.252)	1.000 -----		
PROFIT	0.168 (0.010)	0.012 (0.850)	0.016 (0.808)	-0.037 (0.576)	-0.046 (0.486)	0.308 (0.000)	0.172 (0.008)	1.000 -----	
TANG	0.087 (0.183)	-0.140 (0.033)	-0.136 (0.037)	-0.114 (0.081)	-0.120 (0.067)	-0.014 (0.835)	0.071 (0.279)	-0.049 (0.456)	1.000 -----

Note: The p-values are in parenthesis

previous studies on capital structure and liquidity (Udomsirikula, Jumreornvong, Jiraporn, 2011). However, this paper mainly discusses based on the results estimated with the fixed effect model. Table 3 shows the regressed results between capital structure and liquidity.

According to the fixed effect model, liquidity ratios under all models 1 to 4 shows negative coefficient (CR -3.2%, QR -3.4%, LR -1.3%, CASH -7.6%) which are significant. So, it proves that the more liquid firms are less leveraged. Coefficient of control variables available in the models from 1 to 4 are exhibiting significant effect to capital

structure. Profit and Non-Debt Tax Shield show significantly positive relationship with capital structure while firm size is negatively associated with capital structure. There is no any significant relationship between tangibility and capital structure.

It is notable that R squared of the fixed effect models are ranges from 70% to 73% but in the case of ordinary least square method the R squared value ranges between 31% to 38%. However, all regression's statistics are highly significant in both models. Durbin Watson statistics are approximately close to 2 in fixed effect model.

Table 3. Regression Analysis

<i>Dependent Variable</i>	<i>Total Debt to Total Assets</i>								
	<i>Regression Models</i>	<i>Fixed Effect Model</i>				<i>OLS- regression</i>			
		<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>
C	9.064* (0.000)	9.077* (0.000)	8.649* (0.000)	7.991* (0.000)	1.945* (0.000)	1.567* (0.013)	1.301* (0.038)	1.859* (0.003)	
CR	-0.032* (0.002)	-	-	-	-0.051* (0.000)	-	-	-	
QR	-	-0.034* (0.001)	-	-	-	-0.036* (0.008)	-	-	
LR	-	-	-0.013 (0.487)	-	-	-	-0.032 (0.110)	-	
CASH	-	-	-	-0.076** (0.077)	-	-	-	-0.143* (0.000)	
LSIZE	-0.955* (0.000)	-0.959* (0.000)	-0.919* (0.000)	-0.845* (0.000)	-0.177* (0.000)	-0.144* (0.035)	-0.032 (0.110)	-0.175* (0.010)	
PROFIT	0.769* (0.000)	0.762* (0.000)	0.694* (0.001)	0.732* (0.000)	0.402* (0.024)	0.379* (0.039)	0.338* (0.066)	0.357* (0.047)	
NDTS	0.951* (0.000)	0.953* (0.000)	0.987* (0.000)	0.984* (0.000)	1.006* (0.000)	0.988* (0.000)	1.003* (0.000)	1.020* (0.000)	
TANG	-0.002 (0.984)	-0.009 (0.951)	-0.043 (0.777)	-0.034 (0.821)	0.0382 (0.703)	0.659 (0.522)	0.830 (0.423)	0.0521 (0.606)	
R-squared	0.722	0.722	0.708	0.712	0.378	0.344	0.331	0.365	
Adjusted R-Squared	0.664	0.664	0.648	0.653	0.365	0.329	0.316	0.351	
F-Statistic	12.540	12.54	11.73	11.96	27.82	23.940	22.60	26.23	
Prob (F-Statistic)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Durbin-Watson stat	1.549	1.555	1.540	1.549	0.919	0.878	0.884	0.889	

Note: The p-values are in parenthesis; *1% significance and **5% significance.

Conclusion

The objective of this paper is to investigate the relationship between liquidity and capital structure of manufacturing firms in Sri Lanka as the previous studies indicate an inconsistent relationship between liquidity and capital structure. This research tries to contribute to corporate finance through the study of the relationship between capital structure and liquidity of manufacturing firms. Data were gathered from annual reports of 37 manufacturing companies listed in the Colombo stock exchange during 2009 to 2016. The relationship between capital structure and liquidity was analysed using panel least square and fixed effect models. The results show that all liquidity ratios namely: Current, Cash and Quick are significantly negatively associated with capital structure and Liquidity Ratio is also insignificantly negatively associated with capital structure. Therefore, we could conclude that there is a negative relationship between liquidity and capital structure among the manufacturing companies in Sri Lanka. The results of this study consistent with previous studies that demonstrated negative relationship between liquidity and leverage of the firms.

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 manufacturing 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. Further, it was found that size of the firms is significantly negatively associated with

capital structure and Profit and Non-Debt Tax Shield are significantly positively associated with capital structure. There is no any significant relationship between tangibility and capital structure.

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