

The Relationship Between CS and Profitability: Evidence on Chinese List Firms

Xiyao Chen^{1,a,*}

¹Nanjing Audit University, No. 77, Beiweit Road, Fenghuang Street, Gulou District, Nanjing City, Jiangsu Province, China

a. 1982696559@qq.com

*corresponding author

Abstract: One of the central questions that continues to be discussed in the financial sector is how a company's capital structure (CS) impacts its profitability. In China, with the gradual improvement of the market economic system and capital market's development, this relationship is particularly concerned. This study analyses the correlation between metrics such as long- and short-term debt ratio (LSDR), gearing ratio (GR), total assets (TA), current ratio (CR), and return on total assets (ROA) to understand how a company's financial performance is affected by the allocation of its CS. In this regard, many studies are based on a particular industry, and the results differ. This experiment examines the data of 100 companies from different industries from 2010-2021 and provides strategic recommendations for firms to optimize their CS by providing data analysis and regression models. Multicollinearity Problem was also tested with VIF value, together with self-related issue was examined by Durbin Watson values. This research will help managers to optimize the current assets and debt structure, balance financing methods, and monitor financial indicators to enhance debt repayment and profitability.

Keywords: Capital Structure Impact, Profitability, Data Analysis and Model, Financial Indicator Optimization

1. Introduction

Scholars studying management and finance have long focused on capital structure (CS) optimization in the complicated realm of contemporary corporate financial management [1]. It is widely accepted that an organization's CS, or the proportion of debt to equity funding, has a significant influence on both its potential for growth and financial stability. A rational CS affects a company's long-term competitiveness in the market by lowering financing costs and raising the firm's value [2]. The aim of this research is to gain a deeper understanding of the relationship between CS and firm performance, enabling organizations to adopt more effective financial management strategies. Corporate performance can be measured in a variety of ways. One such method is the ROA, which is used to show the entire efficiency of a company's asset uses [3]. The LSDR, which represents the maturity structure of corporate debt and is a key indication of corporate financial risk, is typically used by Long-Term to measure CS. Furthermore, the CR and the GR. CR are crucial markers of a company's financial health [4]. One of the goals is to better understand the relationship between these financial variables. To that end, 100 companies with financial data spanning from 2010 to 2021 were chosen

as examples. Using regression analysis and SPSS software, this study will look into the relationship between ROA, the LSDR, GR, total asset, and CR.

The study's findings will be a valuable resource for financial decision-making in corporations, particularly in the complex and dynamic economic climate of today. The primary subjects of discussion in this paper will be increasing an organization's profitability and financial stability as well as altering its corporate strategy to accommodate shifting market conditions. Analyze how much of an impact computer science has on business performance. Analyze the substantial impact that computer science has on company success. This study aims to offer insightful analysis and recommendations to investors, policymakers, and corporate management. A framework for balancing debt and equity to maximize corporate value is provided by CS theory [5]. Modern finance theory is improved by having a better understanding of these linkages [6]. In order to create profitable and competitive financial strategies, firms must understand how various CSs affect their performance. An increase in debt in the CS boosts firm profitability since interest payments on debt are tax deductible. Management and investors can utilize these insights to make better financial decisions about debt financing, equity issuance, and dividend policy [7]. These studies provide governments and regulators with knowledge about how CS affects economic stability, enabling them to create laws that support sound business development.

2. Literature review

Using a meta-analytical approach, Binh Thi Thanh Dao aims to clarify the correlation between a company's CS and performance [8]. It draws on the work of Hedges et al. to conduct both quantitative and descriptive analyses, concluding with the verification of a negative relationship between corporate and non-corporate CS. Hedges et al. conducted both quantitative and descriptive analyses, concluding with the verification of a negative relationship between corporate performance and financial decisions that support the trade-offs. It makes use of Hedges et al.'s work from 1985 and 1988 to do quantitative and descriptive analyses, determining that agency costs and the pecking order theory—two financial decisions that underpin the trade-off model—have a detrimental relationship with the success of businesses.

Mihaela Brîndușa uses theoretical, conceptual, and empirical analysis to look at the connection between CS and company performance [9]. It was discovered that whilst certain research indicates a positive connection between CS and company performance, other research points to a negative relationship, and still other research yields conflicting or ambiguous findings. This deepens the scholarly conversation and encourages the creation of analytical tools to better comprehend the dynamic relationship between the two.

Rametulla Ferati makes use of the 150 companies' financial reports that were gathered over the previous ten years [10]. To examine how the CS of Macedonian enterprises affects factor profitability, Ordinary Least Squares (OLS) are used to estimate return on equity (ROE) as a function of LSDR measures and total owner's equity. It has been discovered that selecting the optimal debt to equity ratio can have an impact on the value of the business by balancing a number of conflicting aspects, including risk and profitability.

Abdul Ghafoor Khan examined the connection between Pakistani engineering businesses' 2003–2009 performance and CS [11]. He pointed out that there was an inverse relationship between the company's performance indicators and both its short-term and total debt. Tobin's Q, also, has a negative association with asset size. The study revealed that Pakistani engineering firms heavily depend on short-term debt (SD). This can be linked to market failures and asymmetric information that leads to financing. As a result, internal funds should be prioritized before debt and equity, which highlights the significance of CS optimization and market efficiency.

Rametulla Ferati investigates how CS affects Macedonia's SMEs' profitability [12]. "Based on the financial reports of 150 smes over the past dec-ade, this study uses least squares (OLS) to explore the interrelationship between short - and long-term debt and shareholders' equity and ROE. Contrary to earlier hypotheses by Modigliani and Miller, the study indicated that low debt levels are associated with high profitability, even though there is no theoretically optimal CS. The study's findings provide light on the CS decisions made by SMEs in Macedonia and indicate that, during periods of economic instability, SD and equity financing might be a better option.

According to Herciu Mihaela, CS significantly affects a company's profitability [13]. The research discovered a significant positive relationship between debt-to-equity ratios in the telecom, healthcare, and technology sectors and ROE. Although not as strong, there is a good association between the energy and automotive and parts industries. A lower or greater debt-to-equity ratio may lead to a higher ROE, according to the results when utilizing the debt-to-equity ratio and ROE as the cut-off point. Therefore, figuring out the ideal CS at any level is challenging. To increase their profitability, businesses must combine their sources of finance to identify the best CS.

The research's hypothesis, derived from previous literature, is as follows: ROA is favorably correlated with gearing and CRs and adversely correlated with LSDRs.

3. Methodology

This study uses ROA to represent corporate performance and LSDR to represent CS. It uses SPSS software to regress the correlation between ROA, LSDR, GR, TA, and CR of 100 companies in 2010-2021 to investigate how CS affects business performance.

3.1. Data

The chosen companies are A-share companies that exclude ST and PT stocks due to consecutive losses in ST and PT stocks and ensure that all stock price data from 2010 to 2022 are available. The study covers the period 2010-2022, and the reason for limiting it to this time is that these 13 years contain multiple market cycles, with the A-share market experiencing financial crises, stimulus packages, monetary policy adjustments, and other events, making the conclusions more valuable.

3.2. Research Variables and Models

Based on the prior research and the hypothesis developed in Section 2, the regression model is presented as follows in Equation (1).

$$ROA = \beta_0 + \beta_1 \frac{LDA}{SDA} + \beta_2 GearingRatio + \beta_3 \ln(TotalAsset) + \beta_4 CurrentRatio \quad (1)$$

Where $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4$ are the intercept of the equation. The dependent variabler is ROA, which is calculated by revenue devided by average equity. $\frac{LDA}{SDA}$ and GearingRatio are independent variable, while $\frac{LDA}{SDA}$ is calculated with ST debt and LT debt and GR equals to total debt/owners' equity.

4. Analysis and results

4.1. Regression Analysis Result

Table 1 provides summary describing the statistical properties of the dependent and independent variables in the firm sample.

Table 1: Descriptive measures.

	ROA	LDA/SDA	GR	TA	CR
Mean	0.03	0.54	2.45	36242886063.04	1.54
Median	0.03	0.26	1.53	10432380701.37	1.26
Std.Deviation	0.11	1.11	6.37	121285775302.57	1.50
Minimum	-0.89	0.00	-22.92	76059874.47	0.15
Maximum	2.93	25.34	147.25	1938638128699.07	26.64

During 2010-2021, the global economy experienced several fluctuations, ranging from the recovery from the global financial crisis to a period of growth before the COVID-19 pandemic to a recession triggered by the epidemic. During periods of economic expansion, companies are typically able to realize higher returns on assets because of increased demand, easy credit conditions, and relatively high returns on investment. Conversely, during recessions, demand falls and return on assets tends to be lower. Nonetheless, ROA is still respectable, and most companies' ROA is reasonably steady, as evidenced by the closeness of the mean and median. The 0.11 standard deviation suggests that there are significant differences in return on assets amongst companies.

The 26% long-term debt ratio suggests that these organizations' debt is primarily composed of SD, maybe to preserve a high degree of flexibility and liquidity. The higher proportion of ST debt may be because ST debt is usually less costly and more readily available, but it also means that companies need to refinance more frequently. Long-term debt (LD) helps companies lock in financing costs over the long term and reduces interest rate risk. The COVID-19 outbreak may have caused companies to become cash-flow constrained, thus increasing their reliance on SD to maintain operations. The mean is lower than the median, indicating that a few companies in the dataset have much lower LD ratios than others, which may have pulled down the overall average. For example, capital-intensive industries may prefer LD to finance large capital expenditures, while service industries may rely more on SD. Also, fiscal and monetary policies during the epidemic may have influenced companies' debt financing costs and structuring choices. Of course, companies in different industries may have different capital needs and debt structure preferences.

A leverage ratio 1.53 implies that the company has good solvency and financial stability. Such a leverage level can give the company room for debt financing without excessively increasing financial risk. The median of 2.45 indicates that when ranking these companies in order of magnitude, half have leverage ratios higher than 2.45. This may indicate that most companies rely on higher levels of debt financing, which may be to expand their business, make capital investments, or optimize their CS. Companies in different industries may have different CS preferences. For example, capital-intensive industries may be more inclined to use debt financing, while service industries may rely more on shareholders' equity. The average CR of the 100 companies for the period 2010-2021 is 1.26, while the median is 1.54, which suggests that the short-term solvency of these companies may be less than average and that lower CRs may indicate that the companies have challenges managing their current assets and current liabilities, and may need to improve their liquidity management strategies. During periods of economic expansion, a company may increase its inventories and accounts receivable, thereby increasing its current assets. However, during economic downturns, companies may face inventory buildups and difficulties collecting accounts receivable, lowering the CR. The Pearson correlation coefficients for the variables in our regression analysis are displayed in Table 2. The relationship between CS and profitability is shown via the Pearson correlation test. A company's CR and profitability (as determined by ROA) have a positive relationship. It suggests that companies can increase their profitability by using more current assets, such as cash on hand and accounts receivable.

The variance inflation factor (VIF) analysis reveals that while there is some correlation between the debt ratio and TA, the CR, and the LSDA (LDA/SDA) and the CR, there isn't any multicollinearity among the factors.

Table 2: Correlation analysis

	LDA/SDA	GR	Total Asset	CR
ROA	-0.022	-0.026	-0.003	.058*
LDA/SDA		-0.006	0.009	.542**
GR			.082**	-.101**
Total Asset				-0.049

* Correlation is significant at the 0.05 level.

** Correlation is significant at the 0.01 level.

4.2. Multicollinearity Problem

A serious multicollinearity problem is thought to exist when the Variance Inflation Factor (VIF value) is less than five; a moderate degree of multicollinearity may exist when the VIF value is between five and ten; and a serious multicollinearity problem is thought to exist when the VIF value is greater than ten [14]. Table 3 shows no more than five data points, and there isn't any significant multicollinearity among the variables.

Table 3: VIF

Regression Model	ViF factor
$ROA = \beta_0 + \beta_1 \frac{LDA}{SDA} + \beta_2 GearingRatio + \beta_3 \ln(TotalAsset) + \beta_4 CurrentRatio$	-
LDA/SDA	1.454
GR	1.015
ln(Total Asset)	1.066
CR	1.524

4.3. Self-Related Issues

According to the range of Durbin Watson values, i.e. from 0 to 4, 2 means there is no autocorrelation, less than 2 indicates positive autocorrelation, and more than 2 indicates negative autocorrelation." [15]. In the table, less than two means there is a positive correlation in the residuals. (Table 4)

Table 4: Self-Related Issues

Regression Model	Durbin-Waston factor
$ROA = \beta_0 + \beta_1 \frac{LDA}{SDA} + \beta_2 GR + \beta_3 \ln(Total Asset) + \beta_4 CR$	1.841

4.4. F-test

With a p-value less than 0.05 and an F-Test value of 2.690 in the regression analysis, the model as a whole passed the significance test, and the regression coefficients of the two variables $\frac{LDA}{SDA}$ and CR passed the significance test.

Table 5: F-test

Variable	Return on Equity (ROE)
LDA/SDA	-0.008 (-2.315)*
GR	0.000 (-0.631)
ln(Total Asset)	0.003 (1.287)
CR	0.008 (3.004)*
F-test	(2.690)*
Adjust R ²	0.006

The significant positive correlation between CRs and ROA suggests that companies with Higher CRs might have enough liquid assets on hand to cover their SD obligations, have more efficient inventory and accounts receivable management to increase the turnover of their assets, which gives the company more flexibility to increase the ROA by funding successful ventures. $\frac{LDA}{SDA}$ has a minor adverse effect on ROA, and this may be because LD may involve a higher cost of capital, and the return on these investments may take longer to materialize. In certain market and economic environments, long-term (LD) may increase a company's financial risk, especially during recessions and epidemics, resulting in a lower ROA. Higher LD may also make it more difficult for a business to modify its CS quickly in reaction to market developments, which could have an impact on its profitability and liquidity.

5. Conclusion

5.1. Conclusions

The analysis's findings demonstrate a strong positive correlation between CR and ROA, indicating that an organization's asset profitability increases with how well it can use its current assets to pay down its SD. Furthermore, there is a marginal negative correlation between LSDA and ROA, suggesting that a higher proportion of LD in comparison to SD could potentially harm the company's profitability.

5.2. Recommendation and Contribution

From this analysis, the following recommendations can be provided to firms. First, enterprises should emphasize liquid asset management to ensure sufficient liquidity to cover short-term liabilities and improve their solvency and profitability. Second, even though LD can be a reliable source of funding, an excessive reliance on it could raise financial risk and have a detrimental effect on the profitability of the business. This is because the ratio of long to SD slightly lowers ROA. Businesses should carefully consider how best to employ LD in order to prevent an excessive debt load from negatively affecting overall performance. Thirdly, businesses ought to aim for the best possible ratio of debt to equity financing. By optimizing the CS, the financial stability and profitability of the enterprise can be improved while reducing the cost of financing. Fourth, enterprises should establish a sound financial risk management system, regularly assess the debt structure's impact on the enterprise's performance, and promptly adjust their strategies to cope with market changes. Besides, enterprises should closely monitor their liquidity position to respond quickly during short-term financial stress. And when using financial leverage, companies should consider its impact on ROA and use it

moderately to avoid damaging the company's financial health through excessive borrowing. What's more, companies should continuously monitor financial metrics, including the CR and LSDA, and how they relate to ROA to identify problems and take action promptly.

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