Impact of Working Capital Management & Capital Structure on Profitability: A Study on Shipbuilding Companies in India

An Internship Report for

MGF-651: Internship and Summer Training

Credits: 16

Submitted in partial fulfilment of Master's degree

MBA in Financial Services

by

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DECLARATION BY STUDENT

I hereby declare that the data presented in this Internship report entitled, "Impact of Working Capital Management & Capital Structure on Profitability: A Study on Shipbuilding Companies in India" is based on the results of investigations carried out by me in the Masters in Business Administration in Financial Services at the Goa Business School, Goa University, under the mentorship of Assistant Prof. Jick Castanha and the same has not been submitted elsewhere for the award of a degree or diploma by me. Further, I understand that Goa University or its authorities will not be responsible for the correctness of observations / experimental or other findings given the internship report/work.

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COMPLETION CERTIFICATE

This is to certify that the internship report "Impact of Working Capital Management & Capital Structure on Profitability: A Study on Shipbuilding Companies in India" is a bonafide work carried out by Ms. Fathma Zohra Khan under my mentorship in partial fulfillment of the requirements for the award of the degree of Master of Business Administration (MBA) in the Discipline Financial Services at the Goa Business School, Goa University.

Jick Castanha – Assistant Professor

Date: 29th April 2024

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TO WHOM-SO-EVER IT MAY CONCERN

This is to certify that Ms. Fathma Zohra Khan, a Student of Final Year Master of Business Administration in Financial Services of Goa Business School, Goa University, Goa has undergone **Internship** from 20.02.2024 to 12.04.2024 in GSL.

The details of training undergone by her during her internship in Finance Department are as follows:

1. Introduction to Finance Department.
2. Funding, Financing, Investment Management and Cash Management.
3. Analysis & Verification of various documents related to Finance.

Her Internship Assessment Report is attached as Annexure-I.

We wish her all the success in her further endeavors.

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For **GOA SHIPYARD LIMITED**

12/04/2024

(Shaik Abdur Rahman)
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ABSTRACT

The purpose of this study is to investigate how Indian shipbuilding companies' profitability is impacted by their capital structure and working capital management. For this study, a sample of five shipbuilding companies in India owned by the Central Government is used. For the five-year (2019–2023) study period, financial statements from the sample companies' annual reports were the source of secondary data. The necessary ratios that determined working capital and capital structure were then computed using the gathered data. To characterize profitability, ROA and ROE were selected as the dependent variables. The working capital was determined by the following independent variables: firm size, cash conversion cycle, debt ratio, current ratio, and quick ratio. Additionally, the debt to equity ratio, firm size, interest coverage ratio, long-term and short-term debt, and debt to equity ratio are the independent variables for capital structure. Regression analysis is performed by the research using EViews software on the gathered data. Numerous regression techniques, including pooled least squares and fixed effects, are used to analyze the data. The purpose of the model selection process was to choose the best model amongst the random, fixed, and pooled least squares effects. EViews is a suitable tool for examining dataset correlations and patterns because of its strong statistical analysis capabilities. Working capital and capital structure relationships with ROE were modeled using the pooled OLS approach. The working capital relationship with ROA was likewise chosen using the pooled OLS technique. The capital structure association with ROA was modeled using a fixed effect. The results show that none of the working capital variables—firm size, cash conversion cycle, debt ratio, current ratio, and quick ratio—proved to be significant in connection to ROA. The profitability is impacted by debt structure. Debt that is longer term seems to be more harmful to ROE than debt that is shorter term. Opportunities and possible trade-offs in terms of return on equity are presented by liquidity management.

Keywords: Working Capital, Capital Structure, Profitability and Shipbuilding Companies

1 PROFILE OF THE ORGANIZATION - GOA SHIPYARD LIMITED (GSL)

1.1 Introduction

Under the Ministry of Defence's administrative jurisdiction, Goa Shipyard Limited (GSL) is a Central Public Sector Enterprise. GSL is situated on the southern side of the Zuari River in Vasco-da Gama, Goa. The Portuguese founded the Shipyard on November 26, 1957, under the name "Estaleiros Navais de Goa Limitada." It began operations on September 26, 1967, under the direction of its own Board of Directors. GSL is a certified company with Miniratna, Category-I, ISO 9001:2015 (QMS), 14001:2015 (EMS), and 45001:2018 (OHSMS).

GSL has had exponential growth in several areas related to ship design and building over the past 6 decades. From its modest beginnings of constructing and maintaining small barges, it has developed into one of the Indian subcontinent's top shipbuilders, designing and constructing cutting-edge, highly technological, and sophisticated vessels in-house for the Indian Coast Guard and Navy to meet national maritime security requirements as well as those of other clients, including friendly foreign nations.

1.2 Services & Offerings

GSL is involved in Shipbuilding, General Engineering Services and Ship Repair for defence and commercial sector as listed below:

- Shipbuilding includes Missile Frigate, Advanced Offshore Patrol Vessel, Naval Offshore Patrol Vessel, Offshore Patrol Vessel, Pollution Control Vessel, Fast Patrol Vessel, Missile Craft, Sail Training Ship, Fast Attack Craft, Hydrographic Survey Vessel and Torpedo Recovery Vessel.

- General Engineering Services include Shore Based Test Facility, Damage Control Simulator & Training Facility, Fuel Barge, FRP/GRP Boat, Floating Dock etc

- Ship Repairs include Coast Guard Vessels, Indian Navy Vessels, Commercial Vessels, Sail Training Ships, Vessels of Fishery Survey of India.

In the past six decades GSL has built and delivered over 231 ships and 157 GRP boats. This comprises of sophisticated vessels with a variety of uses in the defense and commercial sectors, and the company has a particular focus on creating contemporary patrol vessels with steel, aluminum, and composite hull structures.

1.3 Internship Description

As an MBA student majoring in Financial Services, I got the opportunity to be appointed for an internship in the Finance department of Goa Shipyard Limited to carry out my internship-based research project efficiently. Through this chance, I was able to learn a great deal about the complex financial operations of a reputable public sector company such as Goa Shipyard Limited, which is regulated and well-established. The internship allowed me to apply academically acquired theoretical principles to practical situations. Building a strong foundation for my future professional aspirations, this internship had been an essential milestone in comprehending the special dynamics and difficulties of financial management in the public sector.

My internship in the finance department provided me with an understanding of the range of duties, including supporting daily financial transactions and reconciliations, as well as helping with budget development, financial analysis, and reporting. Additionally, it entailed working together and interacting with seasoned professionals to obtain real-world knowledge about risk management, financial planning, and regulatory compliance that is unique to the public sector.

1.4 Tasks Handled

Working in the Finance department of Goa Shipyard Limited, I got the chance to work with and assist various section / sub-departments of the Finance department such as Treasury Function, Sales, Insurance, Sub-contracting, Internal Audit etc. The sub-department I worked the most with during my internship is the ‘Treasury Function’. The reason for devoting maximum time in this sub-department was that it dealt with some important aspects like Funding & Financing, Investment Management, Risk Management, Cash Management, Working Capital Management and Relationship Management which were closely in line with my MBA in Financial Services degree and also gave me enough exposure to identify & work on my research project.

The sub-department known as the "Treasury Function" is responsible for managing the financial assets and liabilities of a company, maintaining optimal liquidity, and reducing financial risks. One of its main responsibilities is cash management, which involves careful cash flow monitoring, forecasting liquidity needs, and planning to reduce idle cash while optimizing investment returns.

In a shipbuilding company, the Treasury department is critical to proper working capital management. It ensures that the company has enough liquidity to carry out day-to-day operations such as purchasing raw materials, paying suppliers, and covering operating expenses. Treasury is in charge of cash flow management, which entails optimizing the timing of cash inputs and withdrawals in order to reduce financing costs and maximize idle cash returns. Furthermore, it oversees and manages short-term investments and financing arrangements to meet the company's liquidity requirements while balancing risk and return. The Treasury department contributes to the company's long-term financial health and growth goals by effectively managing working capital.

Additionally, Treasury actively participates in the organization's financial planning and forecasting initiatives by providing information on funding requirements and cash flow estimates to aid in strategic decision-making.

In order to streamline financing arrangements and keep up with market changes, its function also includes relationship management, which involves cultivating links with banks, financial institutions, and external stakeholders. To put it simply, the Treasury department acts as a watchdog over the organization's finances, maximizing its capital structure and fostering strategic expansion via careful cash handling, wise financing choices, and close risk management.

2 INTRODUCTION OF THE RESEARCH AREA

The topic of "working capital management and capital structure impact on profitability in shipyard companies in India" was chosen while working in the Treasury section of the Finance Department of Goa Shipyard Limited, indicating a strategic focus on improving financial performance and sustainability. Decisions pertaining to the finance of the organization fall into three categories. The first decision concerns the overall capital structure of the business; the second is about capital budgeting; and the third is about WCM. Given that it impacts the firm's profitability and liquidity, this is an extremely important decision. *(Bagh et al., 2016)*

Given the nature of shipbuilding operations, which can involve high upfront costs and lengthy production cycles, effective working capital management is critical to ensuring smooth operations and cash flow stability. By studying the influence of working capital management on profitability, we hope to discover areas for improvement and apply solutions to optimize cash conversion cycles, streamline inventory management, and improve receivables and payables.

In addition to working capital management, a shipbuilding company's capital structure, which comprises the balance of equity and debt financing, has a substantial impact on its financial stability and profit. To control risk and cut expenses, the ideal ratio of debt to equity must be determined. Businesses can improve cash flow, fortify their resilience, and maintain long-term success in the cutthroat shipbuilding sector by managing both working capital and capital structure.

2.1 Overview of the Shipbuilding Industry

The shipbuilding industry involves the design, construction, and maintenance of ships and other maritime vessels. It is critical to international trade, transportation, and military. Shipbuilding encompasses a wide range of activities, including the construction of commercial cargo and passenger ships, as well as navy vessels and offshore structures like oil rigs. Shipyards, naval architects, marine engineers, and equipment suppliers are all major industry actors. This sector is cyclical in nature, with demand driven by economic conditions, trade patterns, and government policies relating to maritime infrastructure and defense.

The shipbuilding industry is a highly competitive and open sector worldwide. The shipbuilding sector contributes to national security, industrial development, employment growth, and foreign currency influx. Shipbuilding is a potential business that can help a country achieve rapid economic development if it continues to grow. *(Shaikh & Habib, 2017)*

The shipbuilding sector is vital in India due to the country's wide coastline and expanding marine trade. Historically, Indian shipyards have focused on commercial vessel construction, such as bulk carriers, tankers, and offshore support ships. The government has implemented steps to boost domestic shipbuilding, such as the 'Make in India' program and legislation that encourage local military industry. Despite problems such as competition from international businesses and swings in global demand, India's shipbuilding sector has demonstrated

resilience and growth potential, with chances appearing in areas like as defense shipbuilding, repair, and offshore engineering.

The Ministry of Ports, Shipping, and Waterways is the primary ministry for developing policy measures to promote the Indian shipbuilding and repair industry. There are 43 shipyards in the country, including 8 in the central public sector, 2 in state governments, and 33 in the private sector. The breakdown of the government-owned and controlled shipyards is as follows:

a) Ministry of Ports, Shipping & Waterways

i. Cochin Shipyard Limited (CSL), Kochi

Cochin Shipyard is centrally placed on the worldwide marine route that connects Europe, West Asia, and the Pacific Rim. It has grown into a major shipbuilder in India, serving both the Merchant Navy and the Indian Navy. This shipyard was established in 1972 through technological partnership with MHI, Japan.

ii. Hooghly Cochin Shipyard Limited (HCSL), Nazirgunge – a wholly owned subsidiary of CSL.

iii. Udupi Cochin Shipyard Limited (UCSL), Malpe – a wholly owned subsidiary of CSL

iv. Hooghly Dock and Port Engineers Limited, Kolkata (Under closure)

b) Ministry of Defence

i. Mazagaon Dock Limited, Mumbai

Mazagon Dock Shipbuilders Limited (MDL) is a renowned shipyard based in Mumbai, India. MDL, founded in 1934, has a rich history of building a variety of boats, including battleships, submarines, and commercial ships. It is a major player in India's defense shipbuilding industry, with a reputation for producing high-quality vessels for the Indian Navy and Coast Guard. MDL's ship construction, repair, and maintenance facilities are sophisticated and equipped with cutting-edge technology. The shipyard's skill in indigenous shipbuilding has greatly aided India's maritime capabilities and self-reliance in defense manufacture.

ii. Garden Reach Shipbuilders and Engineers Limited, Kolkata

GRSE is India's largest defense shipyard, with facilities spanning seven units and 176.15 acres. GRSE is a Defence Public Sector Undertaking (DPSU) with shipbuilding as its major activity, as well as the country's only DPSU shipyard engaged in

engineering and engine business. The DPSU has been profitable and pays dividends for the past 28 years. It was listed on the BSE and NSE on October 10, 2018, with the Government of India controlling 74.5% of the shares.

iii. Goa Shipyard Limited, Goa

Goa Shipyard Ltd (GSL) is a renowned shipyard that builds medium-sized advanced vessels for the Indian Navy and Coast Guard, among others. Goa Shipyard Limited is located in Vasco do Gama, Goa, on the southern bank of the Zuari river. GSL is a CPSE controlled by the Ministry of Defence, Department of Defence Production, with the Government of India owning 98.3% of its shares.

iv. Hindustan Shipyard Limited, Visakhapatnam

Hindustan Shipyard Ltd (HSL), located in Visakhapatnam, Andhra Pradesh, is India's leading shipbuilding organization. They specialize in shipbuilding, ship repairs, submarine construction, refits, and design and construction of advanced offshore and onshore structures. HSL's direct sea access, excellent infrastructure, skilled workforce, and expertise in building 200 vessels (including 11 wellhead platforms), repairing 2000 vessels, and refitting 5 submarines make it a reliable service provider for the defense, maritime, and oil sectors.

c) State Governments

i. Alocock Ashdown Co.Ltd (Operations closed)
ii. Shalimar Works Limited, Kolkata

The shipbuilding industry frequently faces severe financial problems. Shipbuilders require significant working capital to construct their ships. This cannot be covered by the company's capital or client down payments. Banks are hesitant to provide a large loan to a single firm due to the high risk involved and lack of credible guarantees. If they do, they will charge hefty interest rates. (Shaikh & Habib, 2017). Shipbuilding requires a significant amount of cash, often 35-40% of the ship's cost, during the construction process. Banks in the country offer an average interest rate of 10.5% for working capital loans, which is higher than China, Japan, and South Korea. Shipbuilding in India has challenges such as technological advancements, shipyard layout, project delays, debt issues, funding gaps, and a lack of educational institutions and R&D centers. *(Mourougane Associate Professor, n.d.)*

In terms of capital structure, Shipyard projects often require major capital investments, and the financing instruments and debt-equity mix used can have a significant impact on profitability, risk exposure, and capital cost. Analyzing the appropriate capital structure allows you to uncover possibilities to reduce financing costs, optimize leverage levels, and increase shareholder value.

3 LITERATURE REVIEW

The purpose of this literature review is to look into empirical research and theoretical frameworks that explain the impact of working capital management and capital structure decisions on the profitability. By combining available evidence, this review aims to provide insights into the elements that influence financial performance in this specialized sector.

3.1 Theory of Working Capital Management

An organization uses its fixed assets to increase production, while its current assets are used to use the fixed assets for day-to-day operations. As a result, current assets, also known as working capital, can be thought of as a company's vitality. It alludes to the portion of the company's capital needed for immediate funding. Working capital management is the process of overseeing this working capital. Maintaining a sufficient level of working capital is the primary goal of working capital management, which involves managing a company's current assets and current obligations. Just enough money should be set aside for working capital—neither more nor less. *(Phuong Dong & Su, 2010)*

Effective working capital management positively impacts both profitability and liquidity in a company's financial operations. Liquidity and profitability are not mutually exclusive concepts. A healthy amount of liquidity ensures a company's ability to meet short-term debts and manage cash flow effectively. Liquidity demonstrates the company's capacity to meet short-term obligations. When running a business, it's important to prioritize liquidity and profitability.*(Agha, 2014a)*

Numerous studies have been conducted to examine the relationship between working capital factors and the operational success of different kinds of businesses, according to a review of the literature. Scholars who have investigated this relationship include A. & A.O., 2022; Arunkumar & Ramanan, 2013; Bagchi et al., 2012; Bagh et al., 2016; Charitou et al., 2010; Dong & Su, 2010; Jana, 2018; K. Chalmers et al., 2020; Mathuva, n.d.; Muhammad et al.,

2016; Nabi, 2018; Oladimeji & Aladejebi, 2020; Raheman & Nasr, 2007; S et al., 2017; Sensini, 2020; Tsagem et al., 2016; Vural et al., 2012 and Zariyawati et al., 2009. Their work has provided important new insights into the variables affecting working capital dynamics and how they affect the sustainability and profitability of businesses in a variety of industries.

(S et al., 2017) The goal of this analysis was to look at the relationship between working capital management and business profitability for 164 manufacturing firms listed on Bursa Malaysia from 2007 to 2011. The specific objectives of this study were to empirically investigate whether there is a significant relationship between working capital management and firm profitability and to determine which theory would best explain the relationship between working capital management and firm profitability. The study demonstrated a substantial positive correlation between exogenous variables (average collecting period, inventory conversion period, and business size) and endogenous variables (profitability). The study found a substantial inverse association between debt ratio (leverage) and business profitability. However, the firm's ability to quickly convert working capital into cash, as measured by the log cash conversion cycle, has no effect on profitability.

(Kenneth Chalmers et al., 2020) This study examined the relationship between working capital and firm success, delving deeper into each of the components that comprise working capital. The SMEs evaluated are those listed in the Bombay Stock Exchange's IPO index. 42 SMEs were examined. The findings revealed a negative and significant link between net working capital (NWC), accounts receivable (AR), and profitability. In contrast, accounts payable (AP) and inventory (INV) have a positive relationship with profitability. The robustness assessments proved the correctness of our results.

(Charitou, 2010) In this paper, an empirical investigation of the impact of working capital management on a firm's financial performance in a developing market was conducted. We hypothesize that effective working capital management leads to increased profitability. The dataset included enterprises listed on the Cyprus Stock Exchange. A total of 43 firms matched all the criteria and were included in the sample. All data were acquired by hand from each firm's annual reports. Results show that the cash conversion cycle, including days in inventory, days sales outstanding, and creditors payment period, is linked to the firm's profitability.

(Agha, 2014) This study aimed to evaluate how working capital management affects profitability. Secondary statistics were taken from Glaxo Smith Kline, a pharmaceutical

business listed on the Karachi Stock Exchange. The research findings indicated that working capital management has a substantial impact on a company's profitability. As a result, managers can improve their firms' profitability by reducing inventory turnover, account receivables ratios, and creditors turnover ratios, but increasing or decreasing the current ratio has no major impact on profitability.

(Hassan Aftab Qazi, 2011) The goal of this research was to determine the link between working capital and profitability (PRT) using statistical analysis of a sample of publicly traded companies, examine the impact of traditional working capital policies (WCP) on firm profitability (PRT), determine whether Working Capital Policies (WCP) can become stable over time, and draw conclusions about the impact of working capital on company profitability. In this study, networking capital, inventory turnover in days, average account receivable, and financial asset to total assets (FATA) were considered independent factors. The sample size was divided across two sectors: automobiles and oil & gas. In this work, panel data regression analysis and time series data were used. The regression analysis makes use of pooled data. In this pooled data, all variables were aggregated at the same level, and certain variables were classified as independent and dependent. Following that, every variable was chosen for regression and correlation analysis. In this study, networking capital, inventory turnover in days, average account receivable, and financial asset to total assets (FATA) are considered independent factors. The study found a beneficial impact of working capital (WC) on firm profitability. The model's fitness (R) was 49.95%. The independent variables account for 49.95% of the model.

(Oladimeji & Aladejebi, 2020) The primary goal of the study was to investigate the impact of working capital management on the profitability of chosen SMEs in the Lagos metropolis. The quantitative research method was used with appropriate secondary data from the annual financial reports of 30 SMEs. Regression analysis was used to determine if the working capital (WC) variables were a significant predictor of the SMEs' profitability. The study found no association between WCM and SME profitability from 2014 to 2018. The report suggests that government policy be directed toward supporting the growth of SMEs, and that SMEs adopt sensible WC policies and strategic strategies aimed at improving WC structure and, ultimately, SMEs' profitability in Nigeria.

(Phuong Dong & Su, 2010) The study was based on secondary data acquired from listed firms in the Vietnam stock market in an attempt to analyze the link existing between profitability, the cash conversion cycle, and its components for listed firms in the Vietnam stock market. The sample is based on the financial statements of 130 enterprises registered on the Vietnam stock exchange. With 130 firms from 2006 to 2008, the study had 390 observations in all. The findings indicate that there is a considerable negative link between profitability (measured by gross operating profit) and the cash conversion cycle. This means that as the cash conversion cycle grows, the firm's profitability will decrease.

(Thuvarakan, n.d.) This research aimed to examine the impact of working capital management, debt, and firm size on profitability over a 5-year period for 60 UK manufacturing firms, 20 construction firms, and 17 telecommunications firms listed on the London stock exchange.60 manufacturing firms, 20 construction firms, and 17 telecommunications firms were observed on the London stock exchange. The technique employed was multiple regression. There is no substantial link between the independent variable and gross operating income in the manufacturing sector. The independent variable had no meaningful link with gross operating income in the telecommunications business. The independent variable had no meaningful link with gross operating income in the construction business.

(Quayyum, 2011) This study attempted to determine whether there is a link between working capital management and the profitability of manufacturing businesses. It emphasized the importance of optimizing working capital management efficiency and taking productive actions to maximize profitability. The data used in this study were obtained from secondary sources, including the company's audited annual reports. The samples were chosen from Dhaka Stock Exchange-listed enterprises. To collect data, first the industries were chosen. Four industries and 28 companies. The findings of this study clearly reveal that, with the exception of the food business, all other selected industries have a substantial association between the Profitability Indices and various Working Capital Components. This paper also demonstrated how the significance degree of the link changes by industry.

3.2 Theory of Capital Structure

Furthermore, this study also focuses on the capital structure impact on profitability of shipbuilding companies. Investigating the relationship between capital structure and

profitability leads to a better understanding of how financing decisions affect the company's overall financial health and performance.

Any company organization must make a critical decision regarding its capital structure. The choice has a significant impact on a firm's capacity to navigate its competitive environment, in addition to being driven by the imperative to optimize returns to diverse organizational constituents. A company's capital structure is essentially a combination of various instruments. A company often has a wide range of options for capital structures. It has the ability to issue either very little or very much debt. It can execute forward contracts, utilize warrants, issue convertible bonds, arrange lease financing, and execute bond swaps. It can issue many different securities in an infinite number of combinations; it just looks for the one that will maximize its total market value. *(Abor, 2005)*

A review of literature shows that many studies have been conducted to study the relationship of determinants of capital structure on profitability of different types of companies (Abor, 2005; Assad & Nasimi, 2016; Chen et al., n.d.; Mihaela & Claudia, 2017; Panda, 2020; Shubita et al., 2012; Singh, 2019; Sofat, 2017; Tailab, 2014; W, 2020). Since a company's long-term survival depends on its ability to increase profitability, the relationship between capital structure and profitability cannot be disregarded. Since interest on debt is tax deductible, the company will be more profitable when it has more debt in its capital structure. Making wise decisions on capital structure requires understanding the connection between the firm's profitability and its capital structure**.** *(Assad & Nasimi, 2016)*

(Abor, 2005) This research investigated the relationship between capital structure and profitability of Ghana Stock Exchange (GSE) listed enterprises over a five-year period. Twenty-two companies were eligible to be included in the study sample. Regression analysis was used to estimate functions that relate return on equity (ROE) to measurements of capital structure. The findings showed a substantial positive relationship between the ratio of short-term debt to total assets and ROE. However, a negative association was discovered between the long-term debt-to-total assets ratio and return on equity. In terms of the relationship between total debt and return rates, the findings demonstrated that the ratio of total debt to total assets is considerably positive and correlates with return on equity.

(Sofat, 2017) The purpose of this paper was to investigate the most significant determinants of capital structure of manufacturing firms in India, as well as to see if capital structure models

derived from foreign research provide convincing explanations for capital structure decisions made by Indian firms using a multiple regression model. The dependent variable is the firm's debt equity ratio, which influences the amount of debt and equity funding. Many factors influence the firm's debt equity mix, including its size, asset composition, profitability, growth, taxation, and business risk. In this study analysis, five variables were chosen : firm size, asset composition, debt service capacity, business risk, and return on assets. These variables have been treated as independent variables. Capitaline Database provided the data set. This database offered a list of the top one hundred manufacturing companies listed in the BSE 500 based on their biggest sales turnover as of 1.2.2011, from a universe of 500 manufacturing enterprises. Only 91 out of 100 companies could be analyzed due to 9 companies' non-availability of data for 10 years. The findings indicated that characteristics such as asset composition, business risk, and return on assets are favorably connected to debt ratio, while firm size and debt payment capability are adversely related. Capital structure appeared to be significantly influenced by asset composition, business risk, and return on assets, whereas firm size

(Mihaela & Claudia, 2017) The main goal of this study was to assess the structure of the balance sheet and suggest some suitable values for increasing firm profitability. The company's profitability was measured by DuPont returns such as ROA and ROE, while the debt-to-equity ratio was indicated by its capital structure. All variables were estimated based on balance sheet figures from fiscal year 2016. The samples include of the most profitable non-financial corporations in the Fortune Global 500. The enterprises will be organized into clusters (depending on industry or debt-to-equity ratio) to determine the significance of the association between earnings and balance sheet structure. The paper's main results recommend the possible increase in firm profitability by implementing an adequate liability and equity structure.

(Assad & Nasimi, 2016) The study aimed to determine the nature of the relationship between capital structure and business performance, as well as investigated the impact of capital structure on firm performance. A sample of 30 enterprises was drawn from the London Stock Exchange's FTSE-100 index between 2005 and 2014. The multiple regression analysis method was utilized to investigate the effect of capital structure on company performance. The findings showed that Interest Coverage had a positive significant influence on ROA, ROE, and ROIC, whereas DE had a positive significant impact on ROE but a negative significant impact on ROA and ROIC. The study indicated that an ideal level of capital structure, effective utilization, and allocation of resources must be used to attain the specified level of efficiency.

(Shubita et al., 2012) This study used Jordanian data to provide worldwide evidence on different capital structure options. The management of capital structure will have a substantial impact on a firm's profitability. The data showed a considerable negative relationship between debt and profitability. This shows that profitable businesses rely increasingly on stock as their primary financing source. However, recommendations based on findings are made to enhance certain characteristics, such as the firm's use of an optimal capital structure, and future research should look into generalizations of the findings outside the industrial sector.

4 RESEARCH PROBLEMS

Even though shipbuilding firms in India contribute significantly to the country's economy, there is still a study gap concerning the relationship between working capital management, capital structure, and profitability in this industry. Although there is a wealth of research on these issues across many industries worldwide, very few empirical studies have focused on Indian shipbuilding companies particularly. Therefore, it is imperative to close this knowledge gap in order to improve comprehension and decision-making in the Indian maritime sector.

Lack of study in this area makes it difficult to understand the particular dynamics, opportunities, and problems faced by Indian shipbuilding enterprises. This makes it difficult to develop customized strategies that maximize profitability and maintain competitive advantage. This study attempts to close this knowledge gap and offer insightful information to industry stakeholders, policymakers, and scholars by examining the relationship between working capital management, capital structure, and profitability in the context of Indian shipbuilding enterprises.

Given the significance of profitability, this study aims to explore the capital structure and working capital management of Indian shipbuilding enterprises. This should make use of models or variables used in earlier research, as well as prior research done in other countries. In light of this, the study's research questions are as follows: Are working capital and profitability in relation to Indian shipbuilding enterprises significantly correlated? Does the profitability of Indian shipbuilding enterprises depend on capital structure?

5 RESEARCH OBJECTIVES

The primary goal of this research is to investigate the impact of working capital & capital structure on the profitability of the shipbuilding companies in India. This study attempts to

uncover the relationship between financing decisions and the profitability of shipbuilding companies in India. In this study, the researcher aimed:

1. To examine the impact of working capital management on profitability of Indian shipbuilding companies
2. To examine the impact of capital structure on profitability of Indian shipbuilding companies.

6 CONCEPTUAL FRAMEWORK

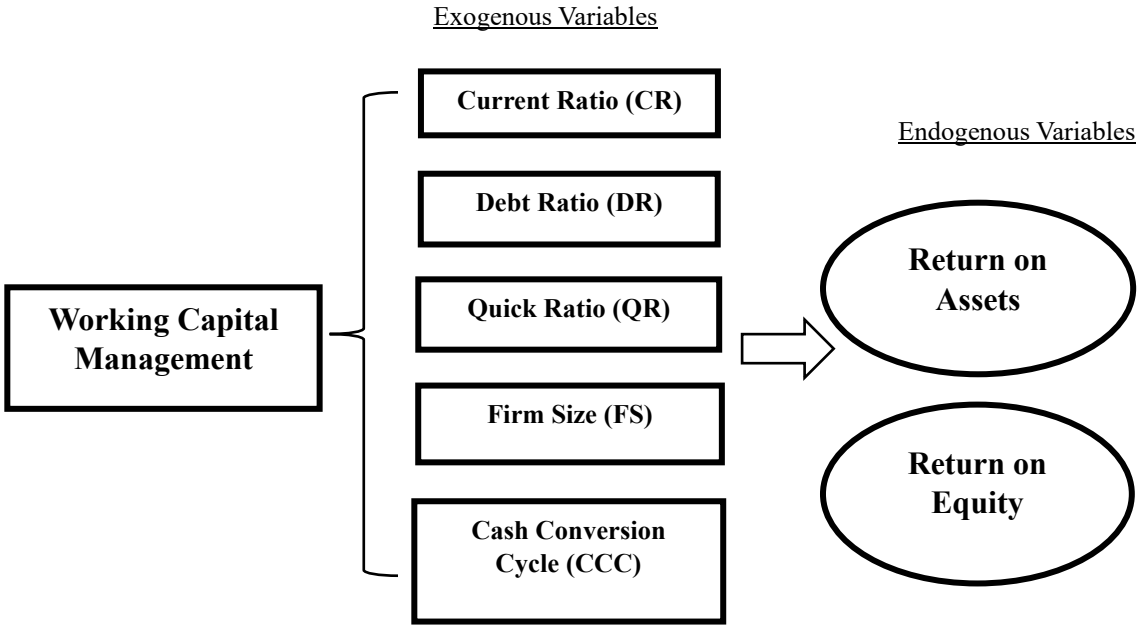

Figure 1: Conceptual Framework of Working Capital impact on Profitability

In Figure 1, the dependent variables are Return on asset (ROA) & Return on equity (ROE), which are the measures of profitability. The independent variables are the Current Ratio, Debt Ratio, Quick Ratio, Firm Size, and Cash Conversion Cycle which represent the Working Capital management. The figure depicts the conceptual framework of the impact of working capital components on the profitability.

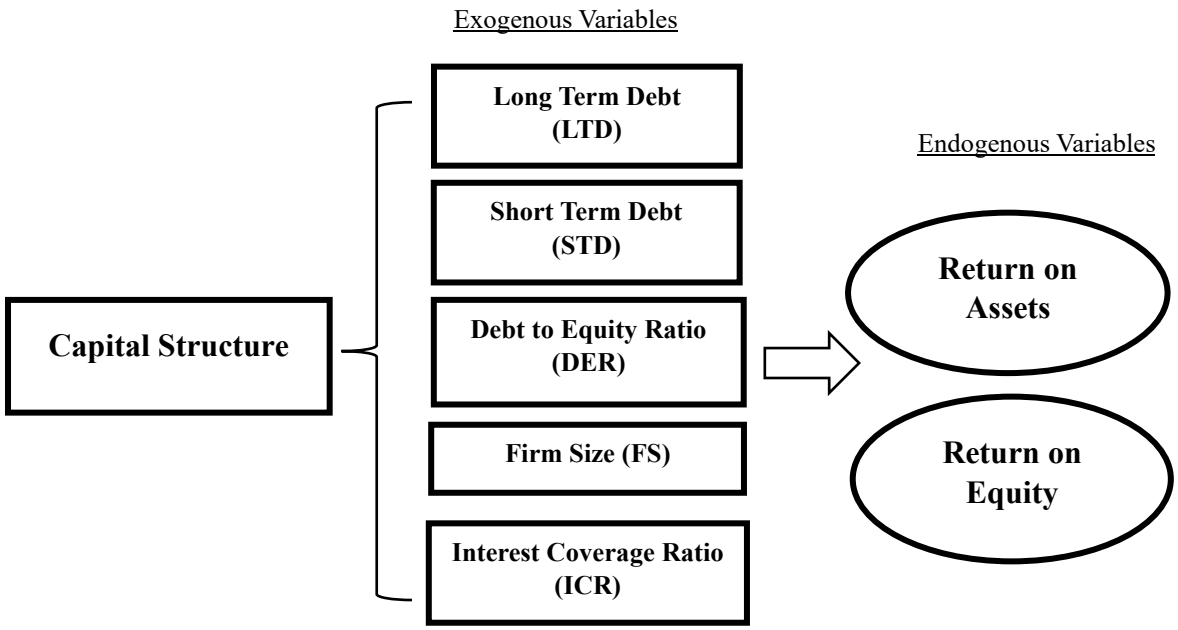

Figure 2: Conceptual Framework of Capital Structure impact on Profitability

In Figure 2, the dependent variables are Return on asset (ROA) & Return on equity (ROE), which are the measures of profitability. The independent variables are the Long Term Debt, Short Term Debt, Debt to Equity Ratio, Firm Size, and Interest Coverage Ratio which represent the Capital Structure.

7 METHODOLOGY

7.1 Sampling Design & Data Source

There are 43 Shipyards in India, 33 are under private sector & 10 are government owned out of which 8 fall under the central government and remaining 2 under the state government .

Our study restricts to only the central government owned shipbuilding companies since private shipyards don't have their financial data disclosed. The study has also not taken into consideration the 2 State Government owned companies since one has its operations closed and another has not disclosed its financial data. Hence our study is based on a sample of 5 Central Government owned Shipbuilding Companies in India.

The list of shipbuilding companies included in the study is as follows:

1. Hindustan Shipyard Limited
2. Goa Shipyard Limited
3. Garden Reach Shipbuilders & Engineers Limited

4. Cochin Shipyard Limited (including its 2 wholly owned Subsidiaries: Hoogly Cochin Shipyard Limited – HCSL & Udupi Cochin Shipyard Limited – UCSL)
5. Mazagaon Dock Limited , Mumbai.

For the purpose of this study secondary data is obtained from financial statements disclosed in annual reports of the above mentioned sample companies for a period of 5 years (2019-2023). The data collected was then used to calculate the required ratios that served as the determinants for Working Capital & Capital Structure.

7.2 Variables

7.2.1 Dependent Variables

- **Return on Assets (ROA)**

  ROA is the dependent variable in this study. Return on Assets (ROA) measures how well a company generates revenue with its current capital. It is mostly used to investigate how much money a corporation makes. The relationship between the assets on a company's balance sheet and its net income after taxes is evident in the income statement. An elevated ratio of return on assets (ROA) signifies proficient management and optimal prospects for the company's future growth. This factor has been taken as a for profitability in various research papers. *(Assad & Nasimi, 2016; K. Chalmers et al., 2020; Quayyum, 2011b; S et al., 2017a; W, 2020)*

- **Return on Equity (ROE)**

  As a crucial indicator of a company's profitability in relation to shareholders' equity, return on equity (ROE) is frequently employed as a dependent variable in financial research. Insights into capital allocation techniques and managerial efficacy are provided by ROE, which captures a company's efficiency in making a profit from its equity investment. In order to examine how many factors, including financial leverage, firm size, industry dynamics, and corporate governance procedures, affect a company's profitability and ability to create value for shareholders, researchers frequently use ROE as a dependent variable in their research.

  (Assad & Nasimi, 2016; Jana, 2018; SU et al., 2017a; Tailab, 2014)

7.2.2 Independent Variables

I. Working Capital

- **Current Ratio (CR)**

  The current ratio evaluates a company's capacity to settle its short-term debts with its current assets. It is a liquidity and efficiency ratio. Since short-term obligations are due within the next year, the current ratio is a crucial indicator of liquidity. *(SU et al., 2017)*

- **Debt Ratio (DR)**

  The debt ratio, sometimes referred to as the debt-to-assets ratio, expresses how much of an organization's assets are funded by debt. By dividing total debt by total assets, it is computed. An elevated debt ratio signifies that a greater proportion of the enterprise's assets are funded by debt, hence augmenting financial risk and rendering the organization more susceptible to fluctuations in interest rates or economic downturns. *(S et al., 2017)*

- **Quick Ratio (QR)**

  A company's liquidity and capacity to pay short-term debts without turning to the sale of inventory are gauged by the quick ratio. Quick assets, or assets that can be swiftly turned into cash, include cash, marketable securities, and accounts receivable. It is computed by dividing quick assets by current liabilities. Better short-term liquidity and a company's ability to fulfill short-term obligations are indicated by a greater quick ratio**.** *(Nabi, 2018)*

- **Firm Size (FS)**

  The size of a company's operations is referred to as its firm size, and it is typically determined by indicators like revenue, market capitalization, or total assets. When it comes to resources, market presence, and bargaining strength, larger companies frequently have an advantage over smaller ones. They might also have to deal with issues including increased competition, sluggish decision-making, and bureaucracy. *(S et al., 2017)*

- **Cash Conversion Cycle (CCC)**

  The period of time between a company's inventory acquisition and the collection of cash from accounts receivable is known as the cash conversion cycle. CCC is a measure of how many days a company's cash is used for business operations. An organization is healthier

if its cash conversion cycle is shorter. When a business holds a dominant position in the market and has the ability to defer payments while making purchases from suppliers, CCC can also be detrimental. Every organization should calculate its cash conversion cycle. *(SU et al., 2017)*

II. Capital Structure

- **Long Term Debt (LTD)**

  The percentage of a company's debt that has a maturity date longer than a year is referred to as long-term debt. It covers debts like long-term loans, mortgages, and bonds.*(Tailab, 2014)*

- **Short Term Debt (STD)**

  The amount of a company's liabilities that is due within a year is known as short-term debt. It usually consists of debts such as accounts payable, credit lines, and short-term loans. *(Tailab, 2014)*

- **Debt to Equity Ratio (DER)**

  The debt to equity ratio shows how much of a company's funding is provided by debt as opposed to equity. A larger ratio may be indicative of greater financial risk as well as increased financial leverage.*(Assad & Nasimi, 2016)*

- **Firm Size (FS)**

  The size of a company's operations is referred to as its firm size, and it is typically determined by indicators like revenue, market capitalization, or total assets. *(Tailab, 2014)*

- **Interest Coverage Ratio (ICR)**

  The interest coverage ratio assesses how well a business can use its operational income to pay its interest costs. It is computed by dividing interest expenses by earnings before interest and taxes, or EBIT. An increased ratio suggests a more robust capacity to satisfy interest payments from operational profits.*(Assad & Nasimi, 2016)*

Table 1: Ratio calculation formulas

RATIOS	FORMULAS
ROA	EBIT / Total Assets
ROE	Net Profit / Total Shareholders' Equity
Cash Conversion Cycle	Average Collection Period + Inventory Turnover Period – Average Payment Period
Average Collection Period	Average account receivable/ Sales*365
Average Payment Period	Average account payable/Purchases*365
Inventory Turnover Period	Average inventory/COGS*365)
Debt Ratio	(Total Liabilities)/(Total Assets)
Firm Size	Logarithm of Sales
Current Ratio	Current Assets/ Current liabilities
Quick Ratio	(Current Assets - Inventory) / Current Liabilities
Short Term Debt	Short-term debt/total assets.
Long Term Debt	Long-term debt/total assets
Interest Coverage Ratio	EBIT / Interest Expense
Debt to Equity Ratio (DER)	Total Liabilities / Total Equity

7.3 Hypothesis

The hypothesis are derived based on the objectives of this study in context of both 'working capital' as well as the 'capital structure' . All the below mentioned hypothesis are 'null hypothesis'.

7.3.1 Hypotheses for Working Capital:

❖ **Return on Assets (ROA) as dependent variable**

H1: The independent variables (cash conversion cycle, debt ratio, firm size, current ratio, quick ratio) has no significant individual relationship with ROA in shipbuilding companies.

H1a: There is no significant relationship of Current ratio with ROA.

H1b: There is no significant relationship of Debt Ratio with ROA.

H1c: There is no significant relationship of Quick Ratio with ROA.

H1d: There is no significant relationship of Firm Size with ROA.

H1e: There is no significant relationship of Cash Conversion Cycle with ROA.

❖ **Return on Equity (ROE) as dependent variable**

H2: The independent variables (cash conversion cycle, debt ratio, firm size, current ratio, quick ratio) has no significant individual relationship with ROE in shipbuilding companies.

H2a: There is no significant relationship of Current ratio with ROE.

H2b: There is no significant relationship of Debt Ratio with ROE.

H2c: There is no significant relationship of Quick Ratio with ROE.

H2d: There is no significant relationship of Firm Size with ROE.

H2e: There is no significant relationship of Cash Conversion Cycle with ROE.

7.3.2 Hypotheses for Capital Structure:

❖ **Return on Assets (ROA) as dependent variable**

H3: The independent variables (short-term debt, long-term debt, interest coverage ratio, debt to equity ratio, firm size) has no significant individual relationship with ROA in shipbuilding companies.

H3a: There is no significant relationship of Long Term Debt with ROA.

H3b: There is no significant relationship of Short Term Debt with ROA.

H3c: There is no significant relationship of Debt to equity ratio with ROA.

H3d: There is no significant relationship of Firm Size with ROA.

H3e: There is no significant relationship of Interest coverage ratio with ROA.

❖ **Return on Equity (ROE) as dependent variable**

H4: The independent variables (short-term debt, long-term debt, interest coverage ratio, debt to equity ratio, firm size) has no significant individual relationship with ROE in shipbuilding companies.

H4a: There is no significant relationship of Long Term Debt with ROE.

H4b: There is no significant relationship of Short Term Debt with ROE.

H4c: There is no significant relationship of Debt to equity ratio with ROE.

H4d: There is no significant relationship of Firm Size with ROE.

H4e: There is no significant relationship of Interest coverage ratio with ROE.

7.4 Model Specification & Model Equations

Model specification In this study, panel data regression analysis of data are taken. For the regression analysis, pooled data & fixed data are used.

The following are the models created to investigate how Working Capital Management affects the profitability of shipbuilding companies in India :

Model Equation 1 : $ROA = \beta_0 + \beta_1 (CR) + \beta_2 (DR) + \beta_3 (QR) + \beta_4 (FS) + \beta_5 (CCC) + \varepsilon$

Model Equation 2 : $ROE = \beta_0 + \beta_1 (CR) + \beta_2 (DR) + \beta_3 (QR) + \beta_4 (FS) + \beta_5 (CCC) + \varepsilon$

In the above two equations, the dependent variable Return on asset (ROA), measures how profitable Indian central government owned shipbuilding companies are as a result of their efficient working capital (WC) management. The independent variables are CR, DR, QR, FS and CCC which represent the working capital management as mentioned in the conceptual framework

And the models developed to look into how Capital Structure impacts Indian shipbuilding enterprises' profitability are as follows:

Model Equation 3 : $ROA = \beta_0 + \beta_1 (LTD) + \beta_2 (STD) + \beta_3 (DER) + \beta_4 (FS) + \beta_5 (ICR) + \varepsilon$

Model Equation 4 : $ROA = \beta_0 + \beta_1 (LTD) + \beta_2 (STD) + \beta_3 (DER) + \beta_4 (FS) + \beta_5 (ICR) + \varepsilon$

In the two equations above, the dependent variable Return on Asset (ROA) quantifies how profitable Indian central government-owned shipbuilding enterprises are as a result of effective capital structure. The independent variables are LTD, STD, DER, FS and ICR that reflect capital structure as specified in the conceptual framework.

7.5 Techniques and Tools Used

The research employs EViews software to do regression analysis on the collected data. The data is analysed using a variety of regression methods, such as pooled least squares and fixed effects. The model selection was done to select the appropriate model between Pooled OLS, Fixed and Random effect EViews provides powerful statistical analysis capabilities, making it an appropriate tool for investigating dataset correlations and patterns.

8 DATA ANALYSIS

8.1 Descriptive Statistics

To examine the data, the following analysis was done. The descriptive statistics of the data is:

8.1.1 For Working Capital

Table 2: Descriptive Statistics for Working Capital & Profitability variables

	ROA	ROE	DEBT_RATIO	CURRENT_RATIO	FIRM_SIZE	CCC	QUICK_RATIO
Mean	0.108457	0.132234	0.456600	1.837019	5.466740	38.49103	1.714001
Median	0.114293	0.143311	0.463579	1.721180	5.471608	36.78652	1.591003
Maximum	0.145216	0.169764	0.558160	2.336832	5.534343	66.43782	2.176025
Minimum	0.045252	0.068820	0.364496	1.393591	5.373749	13.61418	1.320755
Std. Dev.	0.040534	0.038458	0.071970	0.364655	0.061035	19.57000	0.332025
Skewness	-0.714213	-0.955024	0.166890	0.244601	-0.551063	0.229858	0.309792
Kurtosis	2.189461	2.613197	2.103329	1.839668	2.198917	2.133868	1.839627
Jarque-Bera	0.561953	0.791230	0.190714	0.330352	0.386753	0.200317	0.360490
Probability	0.755046	0.673266	0.909048	0.847745	0.824171	0.904694	0.835066
Sum	0.542285	0.661170	2.283000	9.185096	27.33370	192.4552	8.570003
Sum Sq. Dev.	0.006572	0.005916	0.020719	0.531892	0.014901	1531.940	0.440963
Observations	5	5	5	5	5	5	5

The Return on Assets (ROA), which measures the profitability of assets, is currently at an average of 10.85%. In a similar vein, the average Return on Equity (ROE), which represents the profits made for shareholders, is approximately 13.22%. With an average Debt Ratio of 45.66%, it can be inferred that around 45.66% of a company's assets are funded by debt. With an average of 1.84, the current ratio—which gauges a company's capacity to meet short-term

obligations—shows that, generally speaking, businesses have more current assets than current liabilities. A moderate-sized firm is implied by the average firm size of 5.47. The average duration of a company's Cash Conversion Cycle (CCC), which gauges how long it takes to turn investments in inventory and other resources into cash flow, is approximately 38.49 days. Furthermore, the average value of the Quick Ratio, which evaluates a company's capacity to satisfy short-term obligations with its most liquid assets, is 1.71. For most variables, the skewness and kurtosis statistics show moderate positive kurtosis and minor negative skewness, indicating a somewhat symmetrical but significantly peaked distribution. High p-values from the Jarque-Bera test, which evaluates data normality, show that most variables do not significantly deviate from a normal distribution. All things considered, these figures offer a thorough picture of the fiscal stability and operational effectiveness of the businesses under study.

8.1.2 For Capital Structure

Table 3: Descriptive Statistics for Capital Structure & Profitability variables

	ROA	ROE	LONG_TERM_DEBT	SHORT_TERM_DEBT	DER	FIRM_SIZE	INTEREST_COVERAGE_RATIO
Mean	0.108457	0.132234	0.055030	0.080747	0.867421	5.466740	24.06624
Median	0.114293	0.143311	0.061715	0.090885	0.864209	5.471608	17.25731
Maximum	0.145216	0.169764	0.077866	0.093142	1.263260	5.534343	53.26978
Minimum	0.045252	0.068820	0.023944	0.056858	0.573553	5.373749	12.94650
Std. Dev.	0.040534	0.038458	0.021600	0.016066	0.258266	0.061035	16.52237
Skewness	-0.714213	-0.955024	-0.472922	-0.692269	0.545321	-0.551063	1.410647
Kurtosis	2.189461	2.613197	1.815084	1.788600	2.281038	2.198917	3.136106
Jarque-Bera	0.561953	0.791230	0.478885	0.705091	0.355501	0.386753	1.662130
Probability	0.755046	0.673266	0.787067	0.702896	0.837151	0.824171	0.435585
Sum	0.542285	0.661170	0.275150	0.403735	4.337105	27.33370	120.3312
Sum Sq. Dev.	0.006572	0.005916	0.001866	0.001032	0.266805	0.014901	1091.955
Observations	5	5	5	5	5	5	5

The average Return on Equity (ROE) and Return on Assets (ROA) are roughly 13.22% and 10.85%, respectively, demonstrating the effectiveness and profitability of using equity and assets. The average percentages of long-term and short-term debt to total debt are 5.50% and 8.07%, respectively. The Debt-to-Equity Ratio (DER) has an average of roughly 0.87, meaning

that, on average, corporations have a higher share of equity financing relative to debt. This metric of firm size, which averages 5.47, denotes a moderately large firm. An average of 24.07 indicates that the company is in a good position to fulfill its interest commitments when it comes to the Interest Coverage Ratio, which evaluates a company's capacity to pay interest on its existing debt. Some departure from normalcy is revealed by skewness and kurtosis data; this is especially evident for ROA and ROE, which have negative skewness, and the Interest Coverage Ratio, which has positive skewness. Relatively high p-values from the Jarque-Bera test show that most variables do not significantly deviate from a normal distribution. All things considered, these figures offer a thorough summary of the risk profile, efficiency, and financial structure of the businesses that are being studied.

8.2 Correlation Matrix

Table 4: Correlation Matrix – ROA & Working Capital Variables

	ROA	DEBT_RATIO	CURRENT_RATIO	FIRM_SIZE	CCC	QUICK_RATIO
ROA	1.000000	-0.963061	0.924030	0.779343	-0.735762	0.906348
DEBT_RATIO	-0.963061	1.000000	-0.985124	-0.669665	0.533281	-0.977484
CURRENT_RATIO	0.924030	-0.985124	1.000000	0.611224	-0.450464	0.997930
FIRM_SIZE	0.779343	-0.669665	0.611224	1.000000	-0.871419	0.613835
CCC	-0.735762	0.533281	-0.450464	-0.871419	1.000000	-0.424038
QUICK_RATIO	0.906348	-0.977484	0.997930	0.613835	-0.424038	1.000000

The links between various financial parameters are revealed by the correlation matrix. Strong positive relationships are shown by correlation coefficients near to 1, and strong negative relationships are indicated by values near to -1. Return on Assets (ROA) in this matrix shows substantial negative correlations with both the debt ratio (-0.96) and the cash conversion cycle (-0.74), suggesting that the debt ratio and CCC tend to drop as ROA rises. On the other hand, ROA and the current ratio (0.92) and quick ratio (0.91) have strong positive correlations, indicating that higher ROA is linked to higher liquidity ratios. Strong negative correlations between the debt ratio and the current ratio (-0.99) and quick ratio (-0.98) show that greater debt ratios are linked to reduced liquidity. Furthermore, there is a lower negative association between Firm Size and CCC (-0.87) and a mild positive correlation with ROA (0.78). All things considered, these correlations offer insightful information about how the dataset's company size, profitability, leverage, and liquidity interact.

Table 5: Correlation Matrix – ROE & Working Capital Variables

	ROE	DEBT_RATIO	CURRENT_RATIO	FIRM_SIZE	CCC	QUICK_RATIO
ROE	1.000000	-0.797279	0.717574	0.855602	-0.923561	0.689501
DEBT_RATIO	-0.797279	1.000000	-0.985124	-0.669665	0.533281	-0.977484
CURRENT_RATIO	0.717574	-0.985124	1.000000	0.611224	-0.450464	0.997930
FIRM_SIZE	0.855602	-0.669665	0.611224	1.000000	-0.871419	0.613835
CCC	-0.923561	0.533281	-0.450464	-0.871419	1.000000	-0.424038
QUICK_RATIO	0.689501	-0.977484	0.997930	0.613835	-0.424038	1.000000

The return on equity (ROE) and firm size (0.86) and current ratio (0.72) in this matrix show substantial positive correlations, indicating that higher ROE is linked to larger firm sizes and stronger current ratios. On the other hand, ROE and Cash Conversion Cycle (CCC) have a substantial negative association (-0.92), meaning that shorter cash conversion cycles are typically associated with greater ROE. Higher debt ratios are linked to poorer ROE and current ratios, as seen by the substantial negative connection that exists between debt ratio and current ratio (-0.99) and ROE (-0.80). Furthermore, there are smaller negative correlations between Firm Size and the Debt Ratio (-0.67) and CCC (-0.87), and moderate positive correlations between Firm Size and ROE (0.86). All things considered, these correlations offer insightful information on the connections between company size, profitability, leverage, liquidity, and efficiency within the dataset.

Table 6: Correlation Matrix – ROA & Capital Structure Variables

	ROA	LONG_TERM_DEBT	SHORT_TERM_DEBT	DER	FIRM_SIZE	INTEREST_COVERAGE_RATIO
ROA	1.000000	0.103983	0.944024	-0.982878	0.779343	0.629127
LONG_TERM_DEBT	0.103983	1.000000	0.246173	0.056961	0.481530	-0.707011
SHORT_TERM_DEBT	0.944024	0.246173	1.000000	-0.887889	0.657335	0.468910
DER	-0.982878	0.056961	-0.887889	1.000000	-0.734556	-0.744237
FIRM_SIZE	0.779343	0.481530	0.657335	-0.734556	1.000000	0.192394
INTEREST_COVERAGE_RATIO	0.629127	-0.707011	0.468910	-0.744237	0.192394	1.000000

Return on Assets (ROA) shows a substantial positive association in this context with both Firm Size (0.78) and Short-Term Debt (0.94), suggesting that higher ROA is typically associated with larger firm sizes and more short-term debt. On the other hand, ROA and the Debt-to-Equity Ratio (DER) have a substantial negative connection (-0.98), suggesting that lower leverage is linked to higher ROA. While Long-Term Debt has a stronger positive link with Firm Size (0.48), it shows a less positive correlation with ROA (0.10). There is a moderate

positive link between Firm Size (0.66) and Short-Term Debt and ROA (0.94), as well as a high positive association between the two. Strong negative correlations (-0.98) between DER and ROA are observed, whereas moderate negative correlations (-0.73) and (-0.74) between DER and Firm Size and Interest Coverage Ratio are noted. There is a mild positive connection of 0.19 with Firm Size and a strong positive correlation of 0.63 with ROA for the Interest Coverage Ratio. In general, these correlations shed light on how the dataset's profitability, debt structure, business size, and financial stability relate to one another.

Table 7: Correlation Matrix – ROE & Capital Structure Variables

	ROE	LONG_TERM_ DEBT	SHORT_TERM _DEBT	DER	FIRM_SIZE	INTEREST_COVERAGE_ RATIO
ROE	1.000000	0.454488	0.942862	-0.858311	0.855602	0.302754
LONG_TERM_ DEBT	0.454488	1.000000	0.246173	0.056961	0.481530	-0.707011
SHORT_TERM_ DEBT	0.942862	0.246173	1.000000	-0.887889	0.657335	0.468910
DER	-0.858311	0.056961	-0.887889	1.000000	-0.734556	-0.744237
FIRM_SIZE	0.855602	0.481530	0.657335	-0.734556	1.000000	0.192394
ICR	0.302754	-0.707011	0.468910	-0.744237	0.192394	1.000000

Return on Equity (ROE) in this context shows a strong positive association with Firm Size (0.86) and Short-Term Debt (0.94), indicating that larger firm sizes and higher levels of short-term debt are often linked with higher ROE. On the other hand, ROE and the Debt-to-Equity Ratio (DER) have a substantial negative association (-0.86), suggesting that lower leverage is associated with better ROE. There is a larger positive association of 0.48 with Firm Size and a moderate positive correlation of 0.45 with ROE for Long-Term Debt.

There is a moderate positive link between Firm Size (0.66) and Short-Term Debt and ROE (0.94), as well as a high positive association between the two. Firm size (-0.73) and interest coverage ratio (-0.74) show modest negative relationships with DER, but high negative connections with ROE (-0.86). The Interest Coverage Ratio shows a modest negative connection (-0.71) with Long-Term Debt and a weak positive correlation (0.30) with ROE. In general, these correlations shed light on how the dataset's profitability, debt structure, business size, and financial stability relate to one another.

8.3 Regression Analysis

8.3.1 Regression Analysis for Working Capital:

8.3.1.1 Return on Assets (ROA) as dependent variable

I. Model Selection

Statistical tests were employed to guide the selection between Pooled OLS, Fixed Effects, and Random Effects modelling approaches.

1. Pooled OLS V/S Fixed Effect

Table 8: Pooled OLS & Fixed Effect Comparison – ROA & Working Capital Variables

Variable	Pooled OLS		Fixed Effect	
	Coefficient	Prob.	Coefficient	Prob.
C	-0.110583	0.4592	-0.710959	0.0233
CURRENT_RATIO	0.123718	0.2075	0.092925	0.3598
DEBT_RATIO	-0.009976	0.7058	-0.023724	0.7306
QUICK_RATIO	-0.026095	0.7698	0.005109	0.9625
FIRM_SIZE	0.008106	0.7626	0.126171	0.0238
CCC	4.03E-07	0.8242	3.20E-07	0.8663
	R-squared	0.746018	R-squared	0.832928
	Adjusted R-squared	0.679181	Adjusted R-squared	0.732685

- **Redundant Fixed Effects Test:**

Table 9: Redundant Fixed Effects Test – ROA & Working Capital Variables

Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	1.950724	(4,15)	0.1542
Cross-section Chi-square	10.470931	4	0.0332

Cross-section F-test: The p-value of 0.1542 fails to reject the null hypothesis.This tentatively suggests that unobserved entity-specific factors might not significantly bias the Pooled OLS model.

2. Pooled OLS V/S Random

- **Lagrange Multiplier (LM) Test - Breusch-Pagan**

Table 10: Lagrange Multiplier (LM) Test – ROA & Working Capital

Lagrange Multiplier Tests for Random Effects
Null hypotheses: No effects
Alternative hypotheses: Two-sided (Breusch-Pagan) and one-sided (all others) alternatives

	Test Hypothesis		
	Cross-section	Time	Both
Breusch-Pagan	1.945933	0.686698	2.632631
	(0.1630)	(0.4073)	(0.1047)

The p-values across all hypotheses (cross-section, time, both) fail to reach conventional significance levels. This might indicate minimal impact from random effects, supporting the Pooled OLS model.

II. Regression Analysis

Table 11: Selected Pooled OLS Model – ROA & Working Capital Variables

Variable	Pooled OLS	
	Coefficient	Prob.
C	-0.110583	0.4592
CURRENT_RATIO	0.123718	0.2075
DEBT_RATIO	-0.009976	0.7058
QUICK_RATIO	-0.026095	0.7698
FIRM_SIZE	0.008106	0.7626
CCC	4.03E-07	0.8242
	R-squared	0.746018
	Adjusted R-squared	0.679181

a) Interpretation of Coefficients:

Intercept (C): The intercept represents the expected value of ROA when all independent variables are zero. In this case, the intercept is estimated to be -0.110583.

CURRENT_RATIO: The p-value for the current ratio is 0.2075, which is greater than the conventional significance level of 0.05. Therefore, the current ratio is not statistically significant in explaining the variability in ROA at the 0.05 level so, we fail to reject the null hypothesis.

DEBT_RATIO: The p-value for the debt ratio is 0.7058, which is much greater than 0.05. Hence, the debt ratio is not statistically significant in explaining the variability in ROA at the 0.05 level so, we fail to reject the null hypothesis.

QUICK_RATIO: The p-value for the quick ratio is 0.7698, which is substantially greater than 0.05. Therefore, the quick ratio is not statistically significant in explaining the variability in ROA at the 0.05 level sp, we fail to reject the null hypothesis so, we fail to reject the null hypothesis.

FIRM_SIZE: The p-value for firm size is 0.7626, which is well above 0.05. Thus, firm size is not statistically significant in explaining the variability in ROA at the 0.05 level so, we fail to reject the null hypothesis.

CCC (Cash Conversion Cycle): The p-value for the cash conversion cycle is 0.8242, indicating that it is not statistically significant in explaining the variability in ROA at the 0.05 level, so, we fail to reject the null

b) Hypothesis Testing:

Since none of the variables are statistically significant at the 0.05 level, we do not proceed with interpreting their coefficients, as their effects are not deemed significant based on the provided data and model. This suggests that in the given regression model, none of the independent variables (CURRENT_RATIO, DEBT_RATIO, QUICK_RATIO, FIRM_SIZE, CCC) have a significant linear relationship with the dependent variable (ROA). Hence we failed to reject the null hypothesis H1.

c) Model Fit

R-squared: In this case, R-squared is 0.746018, indicating that approximately 74.6% of the variability in ROA is explained by the independent variables in the model. This means that the

model accounts for a significant portion of the variability in ROA, suggesting that the independent variables collectively have some

F-statistic: The F-statistic tests the overall significance of the regression model. It assesses whether at least one of the independent variables has a statistically significant effect on the dependent variable.

F-statistic is 11.16171, and the associated p-value (Prob(F-statistic)) is 0.000040, indicating that the overall model is statistically significant at a conventional significance level of 0.05.This suggests that the independent variables, as a group, have a significant linear relationship with the dependent variable (ROA)..

8.3.1.2 Return on Equity (ROE) as dependent variable for Working Capital

I. Model Selection

Statistical tests were employed to guide the selection between Pooled OLS, Fixed Effects, and Random Effects modeling approaches.

1. Pooled OLS V/S Fixed Effect

Table 12: Pooled OLS & Fixed Effect Comparison – ROE & Working Capital Variables

Variable	Pooled OLS		Fixed Effect	
	Coefficient	Prob.	Coefficient	Prob.
C	0.651269	0.0054	0.443259	0.2734
CURRENT_RATIO	0.579727	0.0004	0.442623	0.0054
DEBT_RATIO	-0.227539	0.0000	-0.070394	0.4638
QUICK_RATIO	-0.621348	0.0001	-0.425527	0.0116
FIRM_SIZE	-0.074276	0.0621	-0.069120	0.3355
CCC	3.90E-06	0.1409	3.50E-06	0.1959
	R-squared	0.864027	R-squared	0.914552
	Adjusted R-squared	0.828244	Adjusted R-squared	0.863283

- **Redundant Fixed Effects Test**

Table 13: Redundant Fixed Effects Test – ROE & Working Capital Variables

Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	2.217344	(4,15)	0.1162
Cross-section Chi-square	11.613651	4	0.0205

Cross-section F-test: The p-value of 0.1162 exceeds the significance threshold (e.g., 0.05), failing to reject the null hypothesis. This tentatively suggests that unobserved entity-specific factors might not significantly bias results, favoring a simpler Pooled OLS model.

2. Pooled OLS V/S Random

- **Lagrange Multiplier (LM) Test - Breusch-Pagan**

Table 14: Lagrange Multiplier (LM) Test – ROE & Working Capital

Lagrange Multiplier Tests for Random Effects
Null hypotheses: No effects
Alternative hypotheses: Two-sided (Breusch-Pagan) and one-sided (all others) alternatives

	Test Hypothesis		
	Cross-section	Time	Both
Breusch-Pagan	0.005440	2.530591	2.536031
	(0.9412)	(0.1117)	(0.1113)

The p-values across all hypotheses (cross-section, time, both) fail to reach conventional significance levels. This finding could imply that random effects are negligible, tentatively supporting a Pooled OLS model. Pooled and Random Effect

II. Regression Results

Table 15: Selected Pooled OLS Model – ROE & Working Capital Variables

Variable	Pooled OLS	
	Coefficient	Prob.
C	0.651269	0.0054
CURRENT_RATIO	0.579727	0.0004
DEBT_RATIO	-0.227539	0.0000
QUICK_RATIO	-0.621348	0.0001
FIRM_SIZE	-0.074276	0.0621
CCC	3.90E-06	0.1409
	R-squared	0.864027
	Adjusted R-squared	0.828244

a) Interpretation of Coefficients:

Intercept (C): The intercept coefficient is 0.651269. This suggests that when all independent variables are zero, the expected ROE is approximately 0.65.

CURRENT_RATIO: The coefficient is 0.579727 with a p-value of 0.0004. This indicates that there is a statistically significant positive relationship between the current ratio and ROE. For each percent increase in the current ratio, we expect ROE to increase on an average by 0.58 percent other things being constant.

DEBT_RATIO: The coefficient is -0.227539 with a p-value of 0.0000. This indicates a statistically significant negative relationship between the debt ratio and ROE. For each percentage increase in the debt ratio, we expect ROE to decrease on an average by 0.23 percent other things being constant.

QUICK_RATIO: The coefficient is -0.621348 with a p-value of 0.0001. This suggests a statistically significant negative relationship between the quick ratio and ROE. For each percentage increase in the quick ratio, we expect ROE to decrease on an average by 0.62 percent other things being constant.

FIRM_SIZE: The coefficient is -0.074276 with a p-value of 0.0621. Although the p-value is greater than 0.05, indicating a lack of statistical significance at the 5% level, it's still worth noting that there may be a weak negative relationship between firm size and ROE.

CCC (Cash Conversion Cycle): The coefficient is 3.90E-06 with a p-value of 0.1409. This suggests that the cash conversion cycle does not have a statistically significant relationship with ROE at the 5% significance level.

b) Hypothesis Testing:

Since the F-statistic is significant (p-value = 0.000000), we reject the null hypothesis (H2) and accept the alternative. This means at least one independent variable has a significant relationship with ROE

For H2a, H2b, H2c, and H2e: Since the p-values for Current Ratio, Debt Ratio, Quick Ratio, and Cash Conversion Cycle are all less than 0.05, we reject the null hypotheses. There is a significant relationship between these variables and ROE.

For H2d: While the p-value for Firm Size is greater than 0.05, indicating a lack of statistical significance, it's important to note that this variable may still have some weak relationship with ROE.

Therefore, based on the regression results, we reject the null hypotheses for Debt Ratio, Current Ratio, Cash Conversion Cycle, and Quick Ratio, indicating significant relationships with ROE. However, Firm Size does not show a statistically significant relationship with ROE at the conventional significance level.

c) Model Fit

R-squared: The R-squared value of 0.864027 means that approximately 86.4% of the variation in Return on Equity (ROE) can be explained by the independent variables included in your model (current ratio, debt ratio, quick ratio, firm size, and CCC). This indicates a relatively strong fit.

F-statistic: The F-statistic of 24.14667 with a p-value of 0.000000 provides strong evidence that the model as a whole is statistically significant.

8.3.2 Regression Analysis for Capital Structure:

8.3.2.1 Return on Assets (ROA) as dependent variable

I. Model Selection

Statistical tests were employed to guide the selection between Pooled OLS, Fixed Effects, and Random Effects modeling approaches.

1. Pooled OLS V/S Fixed Effect

Table 16: Pooled OLS & Fixed Effect Comparison – ROA & Capital Structure Variables

Variable	Pooled OLS		Fixed Effect	
	Coefficient	Prob.	Coefficient	Prob.
C	-0.101516	0.4227	-0.833627	0.0027
LONG_TERM_DEBT	-0.368209	0.0000	-0.183773	0.6506
SHORT_TERM_DEBT	0.172113	0.3133	0.467687	0.0140
DER	-0.023125	0.0001	-0.024763	0.0027
FIRM_SIZE	0.043607	0.0830	0.175500	0.0009
INTEREST_COVERAGE_RATIO	-2.02E-05	0.6009	-9.52E-06	0.7780
	R-squared	0.721215	R-squared	0.859393
	Adjusted R-squared	0.647851	Adjusted R-squared	0.775029

- **Redundant Fixed Effects Test**

Table 17: Redundant Fixed Effects Test – ROA & Capital Structure Variables

Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	3.685235	(4,15)	0.0278
Cross-section Chi-square	17.111859	4	0.0018

The Redundant Fixed Effects Test aims to determine whether the Fixed Effects model is preferable to the Pooled OLS model. The significant results (Cross-section F: 3.685, p-value: 0.0278; Cross-section Chi-square: 17.112, p-value: 0.0018) strongly reject the null hypothesis. This indicates that unobserved, time-invariant heterogeneity across cross-sections (individual

entities) likely influences the dependent variable, suggesting a Fixed Effects model would be more suitable than Pooled OLS.

2. Pooled OLS V/S Random

Table 18: Lagrange Multiplier (LM) Test – ROA & Capital Structure Variables

Lagrange Multiplier Tests for Random Effects
Null hypotheses: No effects
Alternative hypotheses: Two-sided (Breusch-Pagan) and one-sided (all others) alternatives

	Test Hypothesis		
	Cross-section	Time	Both
Breusch-Pagan	1.477530	0.717007	2.194537
	(0.2242)	(0.3971)	(0.1385)

The LM Test assesses the presence of random effects. While the results of the Breusch-Pagan test (p-value: 0.1385) fail to reject the null hypothesis of no random effects. this test suggest that Pooled OLS is appropriate and but Redundant Fixed Effect Fixed is appropriate so conclude that Fixed Effect Model is appropriate.

II. Regression Results

Table 19: Selected Fixed Effect Model – ROA & Capital Structure Variables

Variable	Fixed Effect	
	Coefficient	Prob.
C	-0.833627	0.0027
LONG_TERM_DEBT	-0.183773	0.6506
SHORT_TERM_DEBT	0.467687	0.0140
DER	-0.024763	0.0027
FIRM_SIZE	0.175500	0.0009
INTEREST_COVERAGE_RATIO	-9.52E-06	0.7780
	R-squared	0.859393
	Adjusted R-squared	0.775029

a) Interpretation of Coefficients:

Intercept (C): The intercept coefficient is -0.833627. This suggests that when all independent varables are zero, the expected ROA is approximately -0.83.

LONG_TERM_DEBT: The coefficient is -0.183773 with a p-value of 0.6506. This indicates that there is no statistically significant relationship between long-term debt and ROA, as the p-value is greater than 0.05.

SHORT_TERM_DEBT: The coefficient is 0.467687 with a p-value of 0.0140. This suggests a statistically significant positive relationship between short-term debt and ROA. For each percentage increase in short-term debt, we expect ROA to increase on an average by 0.47 percent other things being constant.

DER (Debt to Equity Ratio): The coefficient is -0.024763 with a p-value of 0.0027. This indicates a statistically significant negative relationship between the debt-to-equity ratio and ROA. For each percentage increase in the debt-to-equity ratio, we expect ROA to decrease on an average by 0.02 percent other things being constant.

FIRM_SIZE: The coefficient is 0.175500 with a p-value of 0.0009. Firm size has a statistically significant positive relationship with ROA. For each percentage increase in firm size, we expect ROA to increase on an average by 0.18 percent, other things being constant.

INTEREST_COVERAGE_RATIO: The coefficient is -9.52E-06 with a p-value of 0.7780. This indicates that there is no statistically significant relationship between the interest coverage ratio and ROA.

b) Hypothesis Testing:

The significant F-statistic (p-value = 0.000063) leads us to reject the null hypothesis (H3) and accept the alternative. This means there's evidence suggesting at least one independent variable has a significant relationship with ROA.

For H3c, H3d, and H3e: Since the p-values for Debt to Equity Ratio, Firm Size, and Interest Coverage Ratio are less than 0.05, we reject the null hypotheses. There is a significant relationship between these variables and ROA.

For H3a and H3b: Since the p-values for Long-term Debt and Short-term Debt are greater than 0.05, we fail to reject the null hypotheses. There is no significant relationship between these variables and ROA.

Therefore, based on the regression results, we reject the null hypotheses for Firm Size, Debt to Equity Ratio, and Interest Coverage Ratio, indicating significant relationships with ROA. However, Short-term Debt and Long-term Debt do not show a statistically significant relationship with ROA at the conventional significance level.

c) **Model Fit**

R-squared: The R-squared value of 0.859393 suggests that approximately 85.9% of the variation in Return on Assets (ROA) can be explained by the independent variables included in your model. This indicates a strong fit.

F-statistic: The F-statistic of 10.18673 with a p-value of 0.000063 provides strong evidence that the model as a whole is statistically significant

8.3.2.2 Return on Equity (ROE) as dependent variable

I. Model Selection

1. Pooled OLS V/S Fixed Effect

Table 20: Pooled OLS & Fixed Effect Comparison – ROE & Capital Structure Variables

Variable	Pooled OLS		Fixed Effect	
	Coefficient	Prob.	Coefficient	Prob.
C	-0.027630	0.8833	-0.289540	0.4778
LONG_TERM_DEBT	-0.414859	0.0008	1.360403	0.0640
SHORT_TERM_DEBT	-0.032835	0.8965	-0.251855	0.3956
DER	0.002728	0.6970	-0.001871	0.8766
FIRM_SIZE	0.033845	0.3552	0.060032	0.4206
INTEREST_COVERAGE_RATIO	-4.96E-05	0.3947	-6.09E-05	0.2999
	R-squared	0.833003	R-squared	0.890191
	Adjusted R-squared	0.789057	Adjusted R-squared	0.824305

- **Redundant Fixed Effects Test**

Table 21: Redundant Fixed Effects Test – ROE & Capital Structure Variables

Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	1.952965	(4,15)	0.1538
Cross-section Chi-square	10.480761	4	0.0331

Cross-section F-test: The p-value of 0.1538 exceeds the typical significance threshold, failing to reject the null hypothesis. This suggests time-invariant entity-specific effects might not significantly bias results, tentatively favoring a Pooled OLS model.

2. Pooled OLS V/S Random

- **Lagrange Multiplier (LM) Test for Random Effects**

Table 22: Lagrange Multiplier (LM) Test – ROE & Capital Structure Variables

Lagrange Multiplier Tests for Random Effects
Null hypotheses: No effects
Alternative hypotheses: Two-sided (Breusch-Pagan) and one-sided (all others) alternatives

	Test Hypothesis		
	Cross-section	Time	Both
Breusch-Pagan	2.602366	0.043528	2.645894
	(0.1067)	(0.8347)	(0.1038)

The p-values across different hypotheses (cross-section, time, both) fail to reach conventional significance levels. This might indicate that random effects aren't a substantial concern. so we conclude that Pooled OLS is an appropriate model.

II. Regression Analysis

Table 23: Selected Pooled OLS Model – ROA & Capital Structure Variables

Variable	Pooled OLS	
	Coefficient	Prob.
C	-0.027630	0.8833
LONG_TERM_DEBT	-0.414859	0.0008
SHORT_TERM_DEBT	-0.032835	0.8965
DER	0.002728	0.6970
FIRM_SIZE	0.033845	0.3552
INTEREST_COVERAGE_RATIO	-4.96E-05	0.3947
	R-squared	0.833003
	Adjusted R-squared	0.789057

a) Interpretation of Coefficients:

Intercept (C): The intercept coefficient is -0.027630. This suggests that when all independent variables are zero, the expected ROE is approximately -0.03.

LONG_TERM_DEBT: The coefficient is -0.414859 with a p-value of 0.0008. This indicates a statistically significant negative relationship between long-term debt and ROE. For each percentage increase in long-term debt, we expect ROE to decrease on an average by 0.41 percent other things being constant.

SHORT_TERM_DEBT: The coefficient is -0.032835 with a p-value of 0.8965. There is no statistically significant relationship between short-term debt and ROE, as the p-value is greater than 0.05.

DER (Debt to Equity Ratio): The coefficient is 0.002728 with a p-value of 0.6970. There is no statistically significant relationship between the debt-to-equity ratio and ROE.

FIRM_SIZE: The coefficient is 0.033845 with a p-value of 0.3552. There is no statistically significant relationship between firm size and ROE.

INTEREST_COVERAGE_RATIO: The coefficient is -4.96E-05 with a p-value of 0.3947. There is no statistically significant relationship between the interest coverage ratio and ROE.

b) Hypothesis Testing:

The significant F-statistic (p-value = 0.000001) leads us to reject the null hypothesis H4 and accept the alternate. This implies evidence that suggests at least some of the independent variables influence ROE.

For H4b, H4c, H4d, and H4e: Since the p-values for Short Term Debt, Debt to Equity Ratio, Firm Size and Interest Coverage Ratio are all greater than 0.05, we fail to reject the null hypotheses. There is no significant relationship between these variables and ROE.

For H4a Long-term Debt we reject the null hypothesis as the p value is less 0.05 which indicates that there is significant relation between Long-term Debt and ROE.

c) Model Fit

R-squared: The R-squared value of 0.833003 means that approximately 83.3% of the variation in Return on Equity (ROE) can be explained by the independent variables in your model. This indicates a strong fit.

F-statistic: The F-statistic of 18.95492 with a p-value of 0.000001 provides very strong evidence that the model as a whole is statistically significant.

9 RESEARCH FINDINGS

Model 1: ROA as Dependent Variable (in relation with Working Capital)

None of the working capital variables (Current Ratio, Debt Ratio, Quick Ratio, Firm Size & Cash Conversion Cycle) proved to be significant in relation with ROA.

Model 2: ROE as Dependent Variable (in relation with Working Capital)

Current ratio, debt ratio, and quick ratio displayed statistically significant relationships. Long-term debt emerged as a significant factor in later models. Liquidity ratios and debt structure seem to have meaningful impacts on ROE. Companies might be able to influence ROE by managing these aspects of their financials.

Model 3: ROA as Dependent Variable (in relation with Capital Structure)

Short-term debt and debt-to-equity ratio exhibited significant relationships with ROA, alongside the previously identified firm size. Both the amount and composition of debt matter. Short-term debt seemed positively linked to ROA, while the debt-to-equity ratio showed a negative association. Interest coverage ratio was consistently insignificant, suggesting it might not be a strong explanatory factor for ROA within your dataset.

Model 4: ROE as Dependent Variable (in relation with Capital Structure)

Long-term debt was the only consistently significant factor, displaying a negative relationship with ROE. The burden of long-term debt financing could negatively influence ROE in shipbuilding companies. Like in the previous model, the interest coverage ratio appears less influential in predicting ROE in this context.

10 CONCLUSION

The primary purpose of this research is to look into the impact of working capital and capital structure on the profitability of shipbuilding enterprises in India. The focus of this study is to determine the relationship between financing decisions and the profitability of Indian shipbuilding enterprises. For the five-year (2019–2023) study period, financial statements from the selected sample companies' annual reports were the source of secondary data. The necessary ratios that determined working capital and capital structure were then computed using the gathered data.

Regression analysis is performed by the research using EViews software on the gathered data. Numerous regression techniques, such as descriptive statistics, correlation matrix, pooled least squares method and fixed effects method, are used to analyze the data. The key takeaways derived from the results of the anlaysis are as follows :

Key Takeaways

- Working capital has no significant impact on ROA
- Debt structure significantly impacts profitability.
- Long-term debt appears more detrimental to ROE than short-term debt.
- Liquidity management offers both opportunities and potential trade-offs in terms of ROE.

Importantly, this study shows the interest coverage ratio to be a relatively weak predictor of profitability in this dataset. This finding challenge conventional wisdom and warrants further exploration.

11 MANAGERIAL IMPLICATIONS

The results of the study on the effect of capital structure and working capital management on the profitability of Indian shipbuilding enterprises would provide insightful information with immediate management applications which are mentioned as follows :

- **Focus on Growth**: Larger firms could prioritize strategies for scaling responsibly, as this could enhance ROA.
- **Optimize Debt Usage:** Managers should carefully assess the trade-offs between short-term and long-term debt to maximize benefits and manage risk.
- **Manage Liquidity:** Maintain healthy liquidity (current ratio) but carefully analyze quick ratio targets to balance profitability and operational efficiency.
- **Go Beyond Interest Coverage:** Managers shouldn't rely solely on this ratio. Look for other metrics that better predict profitability risks within the industry.

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