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A STUDY ON WORKING CAPITAL STRUCTURE OF CHEMICAL INDUSTRIES

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ABSTRACT

This study delves into the intricacies of working capital structure within the context of chemical industries, aiming to provide insights into financial management practices, theoretical implications, and avenues for future research.

Through a comprehensive review of literature, theoretical frameworks, and empirical studies, the study examines optimal working capital management strategies, efficiency enhancement measures, risk mitigation practices, and strategic decision-making processes employed by chemical firms.

Theoretical implications encompass theoretical frameworks such as Trade-off Theory, Pecking Order Theory, and Capital Asset Pricing Model, shedding light on the interplay between working capital dynamics and firm performance.

However, the study also identifies limitations including data availability constraints, industry complexity, and external influences, underscoring the challenges inherent in studying this topic.

Nonetheless, future research directions offer promising avenues for exploration, including the impact of technological innovation, sustainability integration, supply chain resilience, globalization effects, digital transformation, risk management strategies, regulatory changes, behavioral finance perspectives, and long-term value creation.

By addressing these research gaps, scholars can contribute to advancing knowledge and understanding in the field of working capital management within the dynamic landscape of chemical industries, driving sustainable growth and value creation for stakeholders.

Introduction and Review of Literature

With 7% of the nation's Gross Domestic Product coming from the chemical sector, India is one of the world's largest producers of chemicals (GDP). The chemical industry in India is the third biggest in Asia and the sixth largest in the world. In 2019, the chemical sector in India was predicted to be worth $100 billion. Five million people in India are employed by the chemical sector.

The Indian chemical industry produces 80,000 different chemical products. India ranked third in the world for plastic production in 2019. As of September 2019, the alkali chemical sector produced 71% of all chemicals in India.

The chemical industry in India contributes to around 14% of total industrial production. The bulk of the chemicals made by the Indian chemical industry as of 2018 are of the fundamental, expert, and specialised kinds. In 2018, Gujarat was the Indian state that made the highest contribution to the nation's chemical sector. India also produces commodities for the pharmaceutical, petrochemical, fertiliser, paint, varnish, glass, perfume, and toiletry sectors. India's chemical industry is divided into six more specific sub-sectors. These sub-segments include basic organic chemicals, speciality chemicals, chlor-alkali, insecticides, dyes, and compounds based on alcohol.

Basic organic chemicals are produced in large quantities in India. In order to provide scientific and industrial research with the greatest possible scientific, economic, and environmental advantages to the Indian people, the Council of Scientific and Industrial Research (CSIR) was founded in India in 1942.

P. C. Ray, Rajmitra B. D. Amin, and other businesses created the Indian Chemical Manufacture Association, also known as the Indian Chemical Association (ICC), in 1938 to support India's domestic chemical sector.

Basic organic chemicals

One of the most important subsectors of the global chemical industry is organic chemicals. It is essential in supplying raw materials for other industries, such as those producing insecticides, paints, adhesives, medicines, dyestuffs, and intermediates. Major basic organic compounds manufactured in India include methanol, acetic acid, formaldehyde, pyridine, phenol, alkylamines, ethyl acetate, and acetic anhydride. Methanol, aniline, alkylamines, and its derivatives formaldehyde, acetic acid, and phenol are the six main chemicals manufactured in India, accounting for roughly two thirds of the country's basic organic chemical sector.

Inorganic chemicals

Caustic soda (NaOH), chlorine (Cl2), and soda ash (Na 2CO3) are the three inorganic chemicals that make up the bulk of India's chlor-alkali industry.
In modest volumes, hydrogen is also generated in this sector. Apart from soaps and detergents, pulp and paper, textiles, the aluminium processing sector for caustic soda and for soda ash in glass, silicate manufacture, etc. all utilise the inputs from the chlor-alkali business.

Specialty chemicals

Specialty chemicals accounted for 22% of India's total chemicals market as of December 2021.
India has a 4% market share of the world's specialty chemicals in 2019, but by 2025, that percentage is expected to increase to 5.5%. India is home to a number of narrow speciality chemical firms that rank among the biggest internationally in their respective specialist industries.

Bio-pharmachemicals

This is a small but rapidly expanding market category that principally consists of xanthine derivatives, intermediate pharmaceutical products, and active pharmaceutical ingredients (API). APIs are made from intermediates like perindopril, terbutylamine, hydrochloride, etc. and are components of medications for hypertension, cancer, asthma, skin care, etc. The market for xanthine derivatives is expanding in India as a result of an increase in the availability of speciality beverages and energy drinks. The largest businesses in the biopharma industry—Piramal Group, GlaxoSmithKline, Krebs Biochemicals and Industries Ltd.—are also pioneers in the broader biotech industry (KBIL).

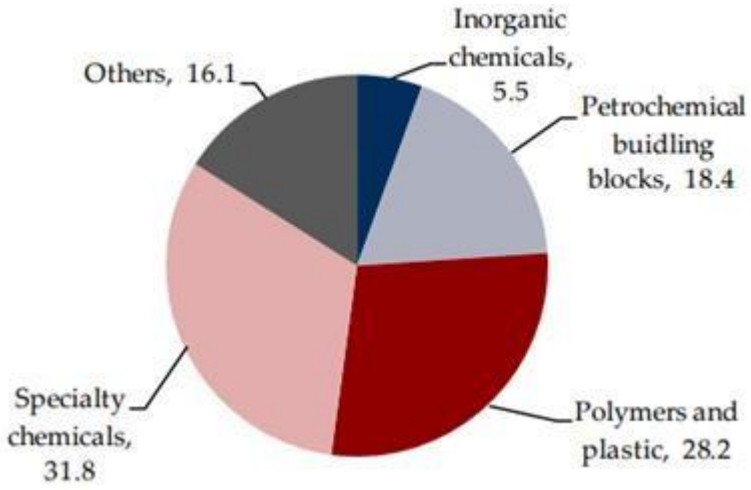

FIGURE 1

Statement of the Research Problem

I have conducted a more in-depth analysis of India during the course of my investigation, but in the case of ratios representing capital structure, businesses in surrounding nations have also participated in the analysis in search of alternative funding options. I work to present a thorough picture of the profitability ratios of the sector's businesses and how they have changed over time so that we may have an understanding of how the industry

has responded to the challenges of the crisis. Beyond standard descriptive statistical analysis, the analysis's goals include trend analysis of the ratios and an examination of the connection between capital structure and profitability.

REVIEW OF LITERATURE

- **Determinants of capital structure: A Case of Indian chemical industry**

October 2012

VikasAdhegaonkar

R. M. Indi

Since the M&M argument on capital structure and firm value in the previous century, capital structure has been a contentious topic. Academic researchers continue to be interested in this topic. Compared to poor countries, the amount of research that is done in industrialised countries is enormous. Managers now have complete freedom to raise money from the domestic market for export. Therefore, it is crucial to research how a finance management chooses the capital structure. This research makes an effort to identify the factors influencing capital structure in the Indian chemical sector. The study's time frame runs from 2006 to 2011. Size, profitability, tangible value, non-debt tax shelter, asset growth, liquidity, and interest coverage ratio have all been used to analyse their linear relationship with the capital structure.

- **The relevance of capital structure of firms performance**

05 July 2022

David Durand

David Durand proposed two extreme theories on capital structure i.e. net income approach and net operating income approach. He proved market relevance and irrelevance theory of capital structure. Modigliani and Miller (1958) in his approach states that in the presence of perfect capital market and taxes capital structure decisions are irrelevant. Sindey L. Barton et.al.(1988) state that management attitude i.e. management risk taking propensities will affect the firm's capital structure decisions. Also top management goal also affect capital structure decisions. Milton Harris et.al (1990) proposed in his theory that debt worked as disciplining device against manager's interest. Moreover debt also generates information about i) timely debt repayment ii) in case of default it reveals the information on operating policy. Myres and Maljuf (1984) describe pecking order theory, which explains hierarchy of financing.

They describes the preference for financing that firms first use internal generated funds, then issue debt and lastly firms issue equity shares to meet the investment.

- **Effect of Profitability, Asset Structure, Business Risk and Sales Growth on Capital Structure In Manufacturing Companies in Basic Industry Sector and Chemistry Listed in Indonesia Stock Exchange**

2021

Andi Amri

The goal of this study is to examine how the capital structure of manufacturing companies in the basic and chemical industries that are listed on BEI is affected by profitability, asset structure, business risk, and sales growth. The population of this study, which is a causal study, consists of all the chemical and basic industrial enterprises listed in BEI. Purposive sampling was used to choose the samples for this study based on criteria of basic and chemical sector enterprises listed on BEI. The sample size for this study is 87. Analysis is conducted using multiple regression. The study's findings indicate that (1) profitability has a negative and insignificant impact on the capital structure of basic and chemical industry manufacturing companies listed on the BEI, (2) asset structure has a positive and significant impact on capital structure, and (3) business risks have a negative and insignificant impact on capital structure of basic and chemical industry manufacturing companies listed on BEI.

- **Capital Structure Across Industries**

18 Jun 2008

Magnus Talberg, ChristianWinge, Stein Frydenberg& SjurWestgaard

This article's goal is to look at the capital structures of corporations with U.S. headquarters that are listed on a stock exchange and operate in various industries. The study explains how the capital structure varies significantly based on the sector in which the company works. Between the five industries under study, there are considerable differences in the debt ratio sensitivity to the explanatory variables. A large majority of the significant coefficients we found in our regressions are consistent with the capital structure theory and previous research. Asset structure and company size are favourably correlated with debt ratio while profitability, growth, and age are adversely correlated. A currency hedging hypothesis is supported by the fact that the debt ratio of the 50 largest companies in the sample is inversely correlated with company size.

- **The Determinants of Capital Structure of the Chemical Industry in Pakistan**

11 Aug 2011

MuhhammadRafiq

This study aims to identify the capital structure of listed companies in Pakistan's chemical industry. The study concludes that by examining the capital structure of a particular industry, one can identify distinctive characteristics that are typically not visible in the combined examination of numerous sectors as done by Shah and Hijazi (2004). Using pooled regression in a panel data analysis, this study examined 26 of 39 chemical companies listed at the Karachi Stack Exchange for the years 1993 to 2004. To investigate their effects on leverage, six regressors were used: company size, tangibility of assets, profitability, income fluctuation, non-debt tax shield (NDTS), and growth.

- **The influence of capital structure on the value of public companies in chemical industry**

04 December 2019

Anna Bitjukova, Elizaveta Markovskaya, Vladimir Bruz and Sergey Vititnev

The study explores the relationship between financial leverage and a company's value in the chemical sector. Financial stability (low growth and sound finances) is thought to be a factor that can affect the relationship. The sample of publicly traded chemical companies is subjected to a panel data analysis. To prevent the endogeneity issue with the leverage in the model, instrumental variables are included. We discover a favourable correlation between financial leverage and value. We demonstrate how excessive debt levels have a negative impact on a company's market value. Additionally, we discover that the relationship between leverage and value is only partially influenced by financial stability.Growth has little to no impact on the relationship while financial health strengthens it. The only significant difference found when comparing influence patterns before and after the 2008 financial crisis is in the relationship between value and square financial leverage. In the first section of this paper, the body of literature that currently exists on the relationship between financial leverage and a company's value will be examined, and hypotheses will be developed. The study's methodology will be covered in the second section. The description of the data and the findings of the econometric analysis will be included in the third section.

IDENTIFICATION OF RESEARCH GAPS

This research paper is to compare and see the capital structure of chemical industries of different countries and different types of chemical industries. It is believed that financial stability (low growth and sound finances) may have an impact on the connection. A panel data analysis is performed on the sample of chemical companies that are publicly traded. Instrumental variables are used to address the endogeneity problem with leverage in the model. We find a positive link between value and financial leverage. The research on the effect of the capital structure of chemical industries on the stock market is not considerate, which may be attributable to variables external to the stock market. Finally, the study uncovered the following omissions in the literature: most articles did not pay much attention and significance to the chemical industry’s capital structure and the distinctive factors of their financial statements was not given adequate consideration. It seems that the determinants of the capital structure of chemical industries must be shown more light upon and needs a further investigation.

RESEARCH METHODOLOGY

2.1 SCOPE OF THE STUDY:

Capital structure of chemical industires and its determinants can help this sector of industry grow in a better and more successful manner that will help in boosting profits. The following focus areas will stimulate growth in the short- to medium-term:

Increasing domestic consumption - Domestic market import substitution models.

Increasing mergers and investments from international corporations - The government has taken a number of efforts to increase FDI inflow into the sector, including removing licencing requirements aside from for hazardous chemicals and permitting 100% FDI in the chemical sector.Over the past four years, the sector has had a significant FDI inflow, mostly as a result of increased industry utilisation levels and the resulting demand for new investments.

Investigating different feedstock possibilities The feedstock market is becoming more competitive nationwide as a result of more affordable naphtha cracking techniques. The rise in capacity and margins of naphtha exports are also supported by the decline in oil prices. The agricultural foundation of India can be used to generate biomass feedstock for biomethanation operations.

International macro-trade developments - The US-China trade war may give Indian exporters the chance to step in and oust China from the global supply chain.

Environmental regulations in the chemical industries of China and the EU are becoming more stringent, which presents a business opportunity for Indian bulk and intermediary manufacturers.

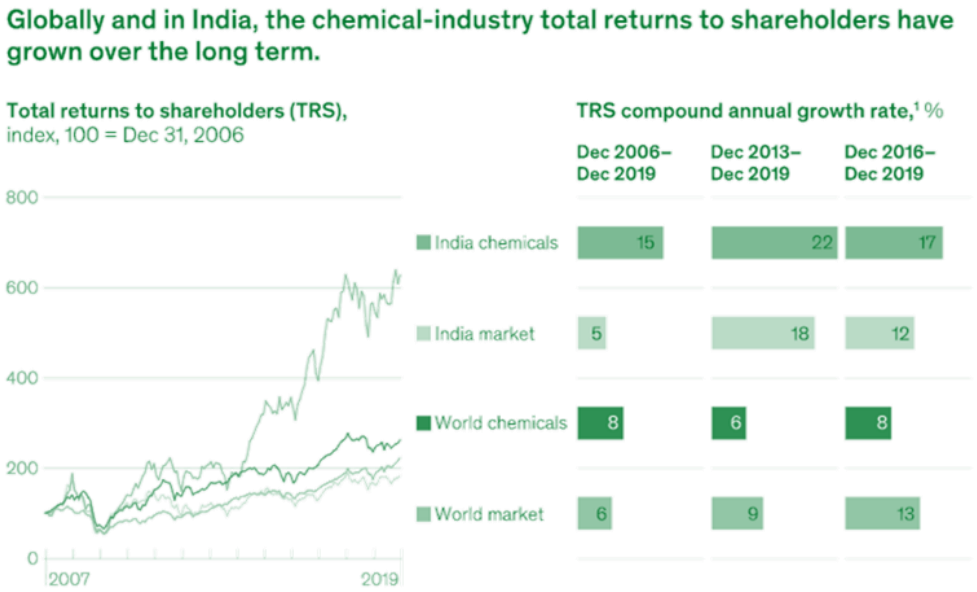

FIGURE 2

RESEARCH OBJECTIVES

- To strengthen their combined strengths and to counteract either company's deficiencies,
- To eliminate a danger or rival within their sector, or to experience rapid exponential growth.
- The goal of this study is to determine the capital structure of the top 8 Indian chemical companies with the help of their financial statements.

DATA ANALYSIS AND INTERPRETATION

TECHNIQUES FOR DATA ANALYSIS:

The data has been analysed on the basis of 4 Ratios requerd to know the capital structure and the profits of the companies.

The 5 types of ratios calculated are:

Working capital to total assets
Retained earnings to total assets
Asset Turnover Ratio
EBIT to total assets
Equity to total liability

WORKING CAPITAL TO TOTAL ASSETS RATIO:

Simply dividing total current assets by total current liabilities yields the working capital ratio. It is also known as the current ratio due to this. It is a metric of liquidity, or the capacity of the company to make payments when they become due.

RETAINED EARNINGS TO TOTAL ASSETS RATIO:

The profitability ratio, which compares the entire retained profits or cumulative profit that the firm earns to its total assets at the conclusion of a certain accounting period, is known as the retained earnings to total assets ratio. This ratio aids in determining how profitable an entity's assets are.

ASSET TURNOVER RATIO:

The ratio of a company's sales or revenues to the value of its assets is known as the asset turnover ratio. It serves as a gauge of how well a business uses its resources to generate money. As a result, asset turnover ratio may be used to gauge a business' performance.

EBIT TO TOTAL ASSETS RATIO :

The profitability ratio is sometimes referred to as the retained earnings to total assets ratio and compares the total retained profits or cumulative

profit that the company makes to its total assets at the end of a specific accounting period. This ratio helps assess the profitability of an entity's assets.

MARKET VALUE OF EQUITY TO TOTAL LIABILITY RATIO:

The market value of a company's equity is sometimes referred to as its market capitalization. It is calculated by dividing the number of outstanding shares by the stock's current price.

The market value of equity/total liabilities ratio demonstrates how much a firm would lose in market value if it filed for bankruptcy before the value of its obligations exceeded the value of its assets. Investor trust in the company's financial stability can be perceived as being strong when the market value of equity to total liabilities ratio is high.

DATA INTERPRETATION:

Generally speaking, the likelihood that a corporation may file for bankruptcy increases with decreasing Z-scores. A corporation is in financial difficulties and is very likely to file for bankruptcy if its Z-score is less than 1.8. A score of 3 or above, on the other hand, indicates that the business is in a good spot and is not likely to declare bankruptcy. A score of 1.8 to 3 indicates that the firm is in the grey region and has a moderate likelihood of declaring bankruptcy.

Depending on the financial soundness of a firm, investors use Altman's Z-score to decide whether to purchase or sell its shares. Investors may think about buying the company's shares if a company's Z-score is near to 3, since there is little chance that it will fail within the next two years.

However, if a firm's Z-score is closer to 1.8, investors may think about selling the company's shares to protect their capital because the score denotes a significant likelihood that the company would fail

CONCLUSION

In conclusion, examining the working capital structure of chemical industries offers critical insights into financial management strategies within this sector. Theoretical frameworks, empirical studies, and practical applications contribute to understanding optimal working capital management, efficiency enhancement, risk mitigation, and strategic decision-making.

However, limitations such as data availability, industry complexity, external influences, time sensitivity, and firm heterogeneity underscore the challenges inherent in studying this topic. Despite these constraints, recognizing and addressing these limitations can lead to more robust research and practical implications.

Overall, a comprehensive understanding of the working capital dynamics in chemical industries is essential for stakeholders to navigate the complexities of financial management, adapt to market dynamics, and drive sustainable growth. By leveraging theoretical insights and empirical evidence, practitioners can optimize working capital management practices, enhance operational efficiency, mitigate risks, and capitalize on emerging opportunities in the dynamic landscape of the chemical sector.

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