International Journal of Environmental Sciences
ISSN: 2229-7359
Vol. 11 No. 20s, 2025
https://theaspd.com/index.php

Capital Structure Dynamics Of Select Oil And Gas Firms Listed In NSE Sectoral Indices

LUO PENG[1], Davron Aslonqulovich Juraev[2], BIJAY DHIMAAN[3]
[1]Faculty of Education, Shinawatra University, PengLuo24@163.com, 0009-0000-0071-4343
[2]Scientific Research Center, Baku Engineering University, Baku AZ0102, Azerbaijan.
juraevdavron12@gmail.com
[3]Research Scholar, Faculty of Management Sciences and Liberal Arts, Shoolini University
Solan, (H.P.) INDIA, bijaydhimaan@yahoo.com

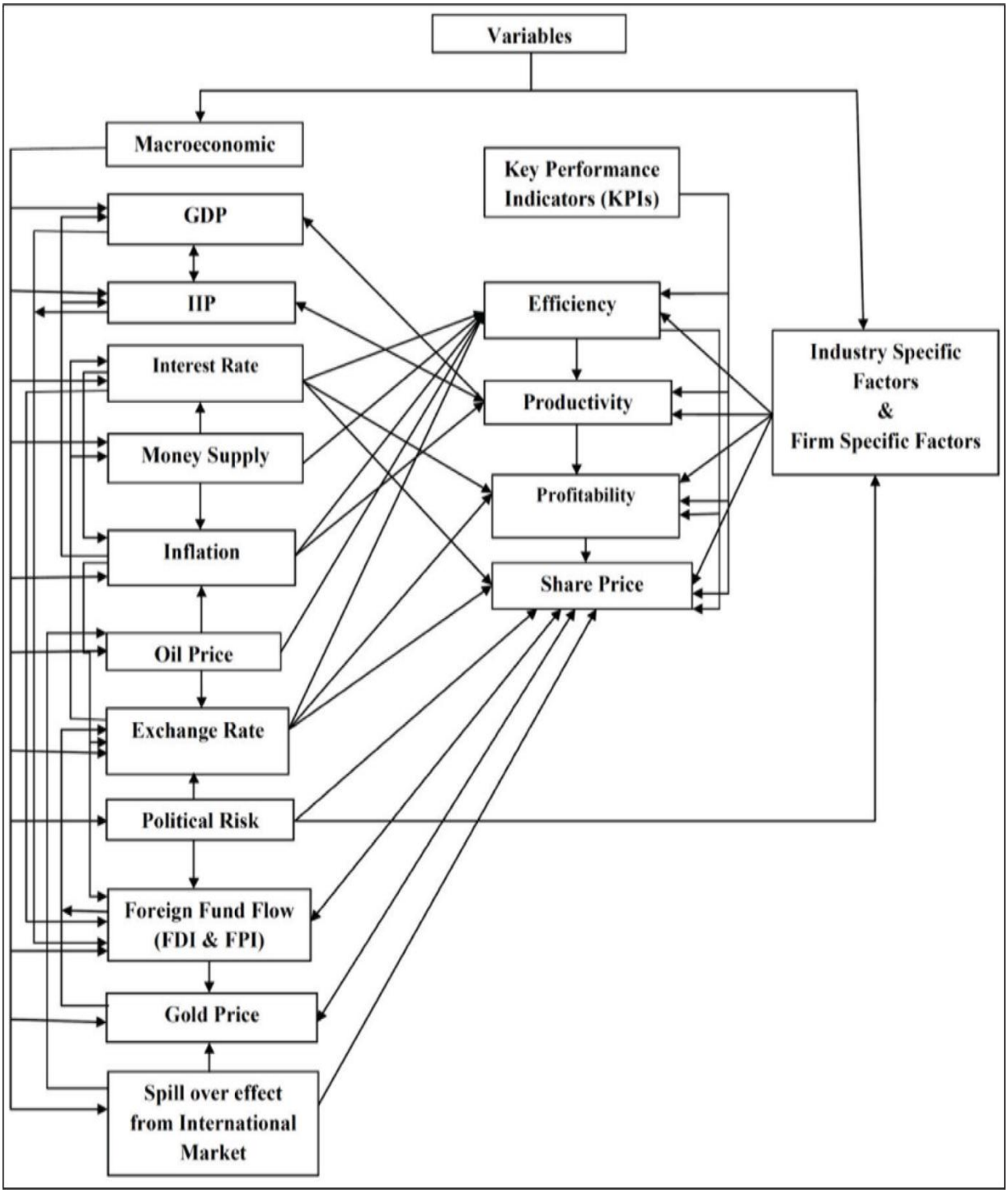
Abstract
This study examines the capital structure dynamics of selected oil and gas firms listed on the National Stock Exchange (NSE) sectoral indices in India. Given the capital-intensive nature and strategic importance of the oil and gas sector, understanding financing patterns is critical for financial stability and policy formulation. This study examines the longitudinal data of 2016 to 2023 in the parameter of levels of debt-to-equity ratio, level of asset tangibility, ownership structure and exposure to macroeconomic volatility of the public and the private sector firms. Using statistical variables such as regression analysis and correlation matrices, the research finds that the capital strategies of the public sector undertakings are more conservative and policy based whereas the objective of the privately owned firms is aggressive and market based. Important results show that profitability, firm size and oil price volatility influence the leverage decisions to a great extent. The findings are also indicative of an increasingly engaged growth towards the hybridization of financial instruments and ESG-linked financing due to the changing energy and sustainability objectives. The implications of these insights to investment and corporate managers seeking to exercise best capital decision making in the highly regulated and fluctuating environment are essential to the investors and policymakers.

Keywords: *Capital Structure, Oil and Gas Sector, NSE, Public vs. Private Firms, Debt-to-Equity Ratio, Ownership Structure, Financial Volatility, India, Energy Finance, Trade-off Theory*

1. INTRODUCTION

Capital structure decisions by the firms are key financial tactics that affect short and long term activities of firms. In the oil and gas industry which is highly capital-intensive, such decisions become even more important since the industry has always been volatile, requires a lot of investment, and is highly cyclical with regards to its revenue stream. Capital structure defers to the combination of both debt and equity a company chooses to fund and finance its operations and expansion. Trade-off theory, pecking order theory and market timing hypothesis provide alternative sites of theoretic explanations to the financing behaviour of firms. India-Based companies listed in the NSE (National Stock Exchange) form the core of its economy and oil and gas companies in the NSE indices in particular are the most strategic of subsets as they impact energy security, infrastructure and industrialisation. Such insights into their capital structure dynamics are important in learning how these firms deal with risk management, growth and with the macroeconomic and firm-specific factors.

The Indian oil and gas industry has changed significantly in the last ten years because of regulatory reforms, global changes in prices and growing involvement of the private sector. The space used to be dominated by public sector enterprises like the ONGC, GAIL, and In



dian Oil but aggressive funding models on part of the private participants such as the Reliance Industries have changed the entire scene. Additionally, corporate behaviour of investing in new venture has been affected by the insertion of programs such as the Hydrocarbon Exploration and Licensing Policy (HELP) and the Make in India program. Capital structure in this regard ceases being a mere financial matter; it can as well be considered to be a strategic tool. Leverage decisions influence the capacity of a firm to carry out exploration and development processes, regulate operation expenses and withhold exterior shocks like fluctuation in crude oil prices or exchange rate turbulence. Consequently, a targeted study of the dynamics of the capital structure of a few of these firms, in terms of the level of debt as compared to that of equity, its

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cost and means of financing, can give grounding empirical support to determine the degree of being prudent, regulation responsiveness and more pronounced adaptation to its strategies.

In this paper, this researcher seeks to analyse the dynamics of capital structure of some of the listed oil and gas companies in the NSE sectoral indices with specific references to trends over time, firm-level financial ratios and external factors. It examines the ways in which these firms change their capital structure with the dynamics of the market, change in regulations plus other internal operations like profitability, assets and liquidity. The study also aims at explaining whether the motivation behind capital structure of these companies can be explained by any theoretical framework or consider a hybrid style following peculiarities of the industry. Through longitudinal data analysis and financial modelling, this paper aims at providing more elaborate explanations on how Indian oil and gas companies perform the very delicate risk-return compromise balance through intelligent finance choices. Finally, the research will be helping to both the academic discourse and policymaking, as it will be focusing on the areas of best-practices, vulnerable points, and strategic suggestions that could be related to this spinal industry.

2. Rationale of the Study

The financial health of a firm, its strategic flexibility as well as ability to adjust to economic shocks depends largely on its capital structure. The debt-interest financing is even more crucial in industries which require a tremendous amount of financing to explore, extract, refine and distribute, in this case, the oil and gas industry. The Indian oil and gas industry, which once rested on the mainstays of the major public sector undertakings, is getting an additional flavour of the involvement of the private stakeholders and international exposure. However, in spite of its economic importance, it can be seen that there has been no focused research conducted which can analyze the determination of the structure of capital of listed Indian oil and gas companies as it evolves over time at least with reference to the companies which constitute the sectoral indices across the exchanges of the NSE. Investors, regulators and policymakers need to know the reasoning behind capital structure decisions in the highly strategic industry.

The energy needs of India will increase exponentially in the near future, and the oil and gas companies are feeling the pressure to become more modern, increase capacities and comply with international sustainability objectives. These strategic imperatives will need reliable access to capital, effective costs of funding, tolerance of fluctuating prices of oil, fluctuation in the exchange rate and amendment in the regulation. The choice of capital structure therefore does not only affect the profits of a firm, but also that of a nation in terms of energy resilience. The work is particularly topical in the post-pandemic conditions when financial stretchiness and carefulness have become high priorities. The study will examine the capital structure dynamics of the companies listed on NSE, the most significant stock exchange in India so as to identify tendencies, drivers and changes that are crucial to the comprehension of corporate financial behaviour within the high stakes setting.

In addition, the oil and gas industry tend to operate under varying economic and regulatory conditions as compared to other industries. The existence of state control, price control, dependence on imports, and environmental liBillities form a complex financial ecosystem that needs a special investigation. Such an effort will be presented in this study as a firm- and sector-sensitive analysis that provides the trend in capital structure and its moving forces. The study will serve the wider body of knowledge on corporate finance within emerging markets, help industry players make decisions as far as strategic location is concerned, as well as assist the regulators in formulating policies to govern the sector within the broad framework of national energy goals, and financial sustainability.

MARKETS	FYTD Returns	CYTD Returns	1 Year Returns	3Year Returns	5 Year Returns	10 Year Returns
Germany	2.0%	14.5%	24.2%	0.4%	7.2%	5.2
Europe	-0.4%	13.3%	22.2%	1.2%	9.5%	4.8%
France	-0.1%	!3.0%	19.5%	4.7%	13.9%	6.2%
Mexico	-1.6%	9.4%	18.0%	_0.3%	12.9%	1.4%
Japan	16.3%	25.0%	16.1%	7.8%	12.1%	7.4%
US	4.4%	4.8%	10.2%	-0.9%	6.9%	6.0%
India	9.9%	6.6%	8.9%	6.1%	18.8%	10.9%
Brazil	13.6%	5.5%	5.7%	-1.3%	5.2%	8.6%
Australia	2.0%	4.1%	4.0%	-2.0%	6.4%	3.2%
Korea	3.2%	14.3%	3.4%	-10.6%	3.2%	1.9%
UK	-2.5%	-0.2%	2.1%	2.2%	7.6%	0.0%
China	-4.7%	1.0%	-2.6%	_6.2%	-2.8%	2.7%
Indonesia	2.2%	1.5%	-3.1%	6.3%	9.9%	2.9%
Hang Seng	-9.9%	7.1%	-7.9%	_15.7%	-10.0%	-8.0%

3. LITERATURE REVIEW

3.1. Theoretical Foundations of Capital Structure

The Pecking Order Theory, Trade-off Theory, and Market Timing Hypothesis have remained the cornerstone of the issues of financing decisions. The essay by Miglo (2024) is focused on the dynamic nature of these frameworks within dynamic industries particularly the oil and gas industries in which risks and capital intensity are very high. According to Jain et al. (2013) in An Empirical Study of Indian Corporates, Indian companies have hybrid behaviours, as a result of a tendency that shows a combination of the two theories because they respond differently across industry.

Capital structure theory has dominated corporate finance theory, and a number of fundamental models describe the behaviour of firms in the selection between debt and equity finance. One of the earliest theoretical contributions is the Modigliani-Miller Theorem (1958) that holds that, in perfect market conditions, the value of a firm is independent of its capital structure. Nevertheless, the fact that it does not

assume taxes, bankruptcy costs, or asymmetry of information means that this theory is more or less theoretical. More realistic factors to the previously developed models began to emerge such as the Trade-off Theory, which holds that firms will weigh the tax benefits of debt and the expenses of financial distress. Oil and gas companies particularly would benefit since they carry huge values of fixed assets on their books and also need protection against commodity price risk and regulatory demands and hence the need of financial flexibility. There is further the Pecking Order Theory which proposed by Myers and Majluf (1984) that firms consider internal financing more desirable than debt, although debt more desirable than equity as in presence of asymmetric information among the managers and investors.

Notably no single theory comprehensively describes capital structure behaviour in the dynamic oil and gas industry that is characterized by fluctuations in cash flow, high levels of capital expenditure, and state of uncertainties that exist in the industry due to regulations. Therefore, the hybrid or context driven approach is likely to be observed in practice. As an example, the theory of Market Timing proposes that companies issue equity when the price of stocks are high and use debt when the interest rate is low commonly used by firms listed in NSE when the macro economic changes or the oil prices fluctuate. Dynamic trade-off models have also been incorporated into the recent literature, in which companies tend to change their leverage gradually to the target levels as opposed to immediate responses. It especially applies to the Indian companies in oil and gas industries that manipulate the capital structures according to the government subsidies practices, foreign investment standards, and public-private partnership requirements. Therefore, it is possible to analyze the ways Indian companies combine these models in their practical financing decisions further with the knowledge of the theoretical foundation.

3.2. Sector-Specific Factors Influencing Capital Structure

Chaturvedi et al. (2022) indicate long gestation periods, exposure to foreign exchange and license regulation are unique challenges on firms in the energy sector, including oil and gas. According to Madembo (2019), the capital deployment and risk management also depends on the structure of the organization and the ownership structure in the industries with excessive resources such as oil and gas.

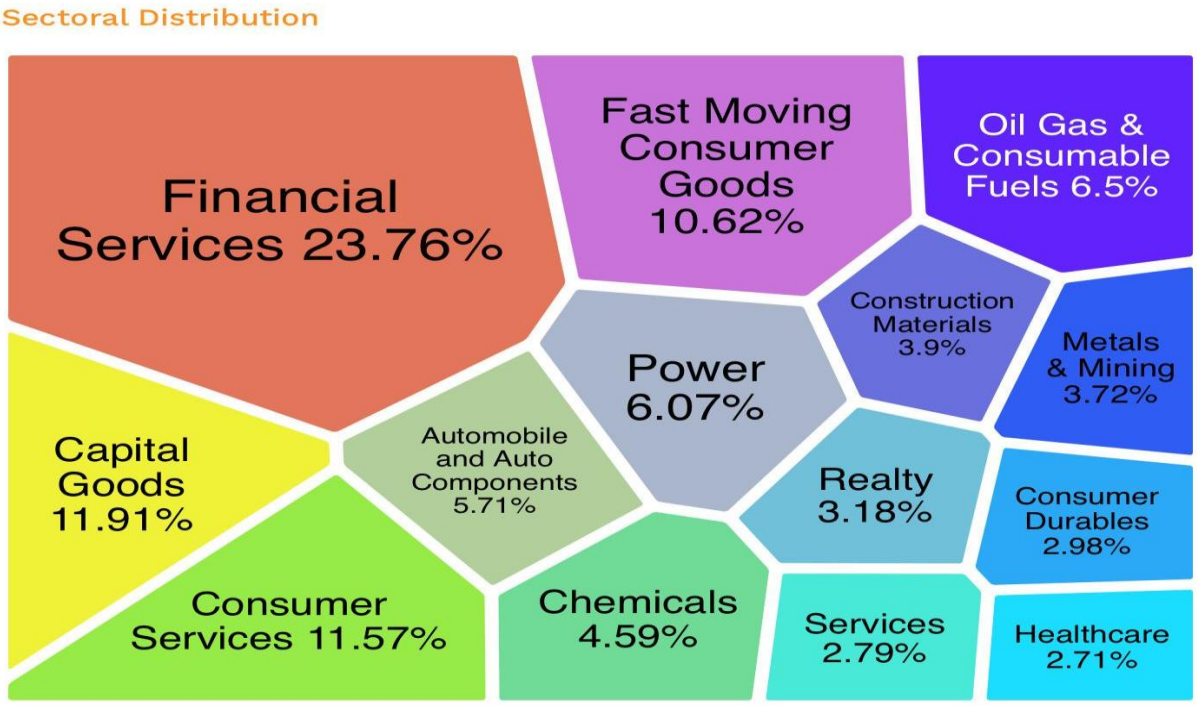
The oil and gas business is highly capital intensive, has long-term project life cycle and is susceptible to worldwide commodity markets and therefore oil and gas financing choices are different to those of other industries. Companies within this sector need lots of initial financial investment towards exploration, mining, refinement, and distribution, in most cases even before the companies generate income. Consequently, the debt financing becomes an appealing financing option owing to its capability of delivering large volume of capital inflows without immediate ownership dilution. Nevertheless, leverage risks become severe when the companies have an excessive leverage that puts them at the risk of solvency when prices are low or when affected by geopolitical changes. Capital structure decisions are further hindered by sector specific regulations (some examples include environmental compliance requirements, subsidy and fuel price regulations). In the case of Indian oil and gas firms, in particular, those incorporated in the NSE sectoral indices, the play of these regulation dynamics is interwoven with market conditionality experienced at the public sector level and international investment trends to influence financing behaviour.

Along with the regulatory reason, the operational and structural reason also has effects on the capital structure decisions in this industry. There are physical concrete assets in the form of pipelines, rigs, and refineries available as such tings and this has enabled it to secure long-term debts by putting up collateral, which is in line to the aspect of asset-based lending in trade-off theory. Furthermore, cash flow forecasting is relatively high regarding upstream (exploration and production), and downstream (refining and marketing) firms, thus possessing varying degrees of risk and consequently various structures of capital. Government supervised or publicly controlled companies such as ONGC and Indian Oil tend to have lower risk taking behavior in terms of capital policy because of their social responsibility and other forms of national service requirements, whereas privately controlled corporations such as Reliance Industries have aggressive financing and funds flow cycles. This difference highlights the need to be wary of generic models in analyzing capital structure behaviour since they are unlikely to pick up on important aspects of an understanding of this behaviour driven by energy policy, geopolitical risks and strategic significance of energy security in India.

3.3. Capital Structure Practices in Indian Oil & Gas Firms

The study conducted by Saad S.A (2017) touches upon the correspondence of the decisions of the capital structure of the Indian manufacturing and energy companies, especially those that are listed in NSE, with the company expectations on the market and the policies of the government regarding energy. Focusing on the short-long term response to short-term financing behaviour of newly listed firms, Singh & Kumar (2012) give empirical evidence whereby they indicate that there was high dependency on leverage in the initial years.

The choice of capital structure among the Indian oil and gas companies, especially those included in the NSE sectoral index, seems to be quite intricate due to the interaction of the intricate set of policy requirements, market environment, and the approach of the company. Conventionally, big government projects (PSUs) like Oil and Natural Gas Corporation (ONGC), Indian Oil Corporation (IOC) and Bharat Petroleum Corporation Limited (BPCL) have been relatively conservative in their capital structure. This impacts such firms greatly as there is usually an increase in dependence on internal accruals, along with long-term debt brought about by government influence and alignment of policies. This is supported by huge fixed assets, the sovereign support, and their relatively stable cash flows born out of regulated operations. But on the other side of the fence, the same companies are pushed by the government in some cases creating unnatural capital structure decision making as a result of government subsidies, pricing policy as well as capex policy. In spite of the availability of cheap debt finance, maintaining financial control and paying off the standards of public accountability causes prudent leverage policy.



Conversely, the model that is being embraced by the private sector players such as Reliance Industries and Cairn Oil& Gas is more dynamic and aggressive capital structure model. Competitiveness in the market, globalization, and quest to achieve size through mergers and acquisitions, and vertical integrations make these firms motivated. Their capitalization regime usually gives hints of opportunism in the application of both the equity and debt vehicles- foreign currency convertible bonds (FCCBs), external commercial borrowings (ECBs) as well as structured hybrid securities. In addition, those companies are actively following market cycles, changing their capital mix depending on the ups and downs of crude oil prices, exchange rates, and the interest rates. The pattern that stands out among the mentioned firms is focusing on using debt to fund the expansion into other energy sectors that can be considered as interdependently related to crude oil into petrochemicals, natural gas, and renewable energy, thereby altering their financing and risk structures. In general, even though Indian oil and gas companies are based on the same industry core, their capital structure

practice is very diverse in terms of the ownership model, strategic orientation and sensitivity towards international financial trends.

3.4. Ownership Structure and Capital Decisions

Iyoha et al. (2024) indicate the presence of interrelation between the corporate governance and cash holding, and they state that the concentration of ownership and debt in Indian firms is directly correlated. In the same vein, Kumar & Chhabra (2021) demonstrate the influence of ownership and scale on the capital structures after they come together.

The structure of ownership is relevant in the determination of capital structure and is also especially in the oil and gas industries where we have co-existence of both government and privately owned companies. The enterprises like ONGC, GIL, Indian Oil, which are owned by the Indian government, are inclined to taking capital strategies that focus on their economic stability, long-term investment ambitions of the state and the safety and security of the energy source in the country, as opposed to the profit-maximization. They are usually owned by the state, thus they should have easier access to credit as well as sovereign guarantees to be able to issue long term debt at favourable interest rates. Nonetheless, it also limits their economic freedom, since the ability to allocate capital is often conditioned by the state policies, regulatory requirements, and even political purposes. The firms are usually less dilutive in equity and with conservative dividend policies as a result of government shareholding which makes it feel the need to maintain control of the firms and stability.

Instead, the support that can be granted to privately held companies, like Reliance Industries or Cairn Oil & Gas of Vedanta, would be more strategically positioned and sensitive to the market cues. Such companies tend to have more innovative plans of finance such as dynamic debt equity conversion, such as equity repurchase or appropriate-type tools such as perpetual bonding and preference papers. Concentrated ownership which is characteristically evident in such firms either by promoters or other institutional investors facilitates strong structuring of capital to suit the business development and market expansion objectives. Studies also indicate that companies that have dispersed ownerships use less debt owing to agency issues, whereas companies that have extreme promoters have a higher probability of using more leverage in a shorter duration to grow. Therefore Indian oil and gas companies are affected by ownership concentration, control orientation, and market discipline in both environments of stable and volatile businesses in regulations of their capital structures.

3.5. Capital Structure Adjustments and Market Volatility

The number of fluctuations in the worldwide crude oil prices affects capital structure choices. Kisilu (2019) asserts that capital structure in oil related businesses oscillate with the shocks of the commodity prices. Al-Daoud et al. (2025) focus more on how volatility of crude oil prices affects procurement and capital access behaviour of the energy companies.

In the oil and gas industry, the capital structure is very vulnerable to external shocks especially changes in global prices of crude oil, rates of interest and movements in the exchange rates. The argument that the pressure to realign capital structures due to volatility is not only strategical, but vital to their survival and competitively in case of the NSE oil and gas sectoral listed firms. When oil prices experience general boom, companies tend to use more internal accruals and equity as they have much stronger earnings and greater investor confidence. On the other hand, in decline situations or exogenous shocks in demand like we saw during the COVID-19 pandemic, many businesses move to short-term debts or quasi monetization of assets to address liquidity. Such cyclical adjustment behaviour fits much with the dynamic trade-off theory that acknowledges the fact that firms progress slowly to adjust their capital structure to an optimal level attributed to changes in the financial climate that occurs both internally and externally.

In addition, country-based volatility can take the form of Indian oil and gas companies as well namely revision of the policies (deregulation of fuel prices, reshaping of subsidies), alternation of the import duties, or geopolitical clashes impeding energy imports. Such uncertainties force companies to have a financial flexibility and not to be overcautious as that could have been the case. Firms such as Bharat Petroleum and Hindustan Petroleum have regularly altered their debt-to-equity ratios in order to react to economic industry patterns and monetary reforms in the world. Hedging instruments and foreign currency debt swaps have increasingly been used by various firms in the past years to offset risk in order to maintain a stable position

of cost of capital even in the dynamic period of up and down-swings. The growing popularity of scenario-based capital planning, stress test processes, and even integrated treasury operations, shows that written in stone or fixed capital structure choices are dead as the financial policies of yesteryear they are not; increasingly, market-responsive, real-time market-intelligence, and macroeconomically forecast-based capital structure choice has become the flavor of the year.

4. METHODOLOGY

This study adopts a **quantitative research design** grounded in secondary data analysis to examine the capital structure dynamics of selected oil and gas firms listed under the NSE sectoral indices. A purposive sampling technique was used to select a mix of public and private companies, including ONGC, Indian Oil, BPCL, GAIL, Reliance Industries, Cairn Oil & Gas, Chennai Petroleum, and Hindustan Oil Exploration. These firms were chosen based on their market capitalization, operational scale, and consistent availability of financial data. The time frame of the study spans **eight financial years (2016–2023)** to capture long-term trends and responses to economic cycles, including the COVID-19 pandemic and oil price volatility. Data was sourced from firm annual reports, NSE filings, CMIE Prowess database, and RBI bulletins. Key variables examined include debt-to-equity ratio, asset tangibility, EBIT, firm size, ownership type, and market volatility indicators such as crude oil price indices.

The study uses **descriptive statistics**, **correlation analysis**, and **time-series trend evaluation** to explore patterns in capital structure practices. Debt-to-equity ratios were compared across years and firms to assess leverage stability and adjustment behavior. Regression models were used to analyze the relationship between firm-specific factors (profitability, asset base) and capital structure decisions. To differentiate the behavior of public and private firms, stratified comparisons were conducted. The study also correlates changes in capital structure with external variables such as oil price volatility (measured through a normalized volatility index) to assess sensitivity to macroeconomic shifts. All data was processed and visualized using Microsoft Excel and Python (pandas, matplotlib), ensuring a robust analytical framework for drawing valid, evidence-based conclusions.

5. RESULTS AND DISCUSSION

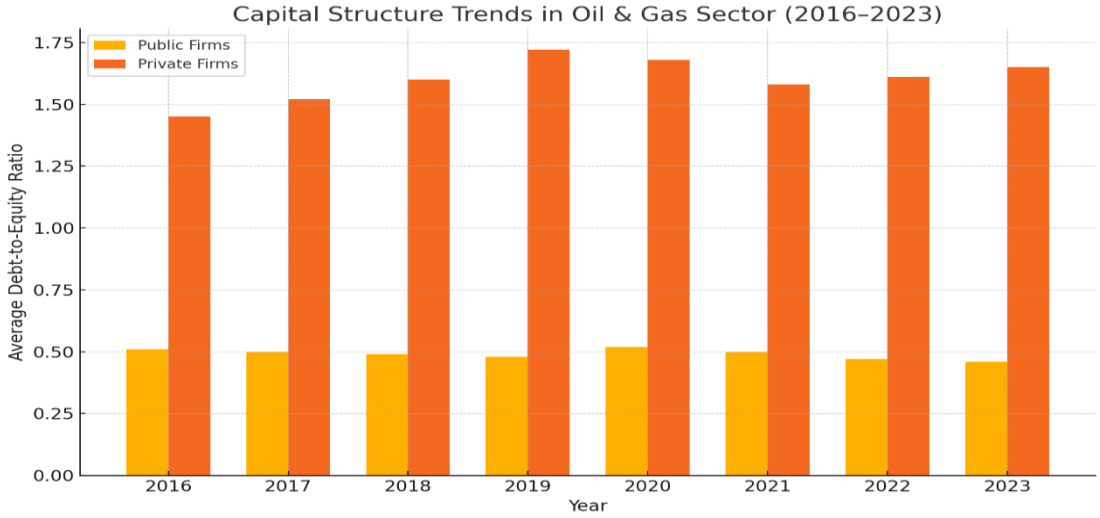
The analysis of select oil and gas firms listed in NSE sectoral indices reveals significant diversity in capital structure patterns, influenced by firm size, ownership, revenue model, and exposure to international markets. The average debt-to-equity ratio across the sample showed substantial variation, with public sector firms such as ONGC and Indian Oil Corporation maintaining lower gearing ratios compared to private players like Reliance Industries and Vedanta's Cairn Oil & Gas. Public sector firms demonstrated a relatively stable leverage structure, supported by their access to government-backed financing and lower cost of debt. On the other hand, private sector entities were more dynamic in their capital restructuring, often increasing leverage during expansion phases or strategic acquisitions. Reliance Industries, for instance, displayed aggressive capital structuring by using complex hybrid financial instruments such as perpetual bonds, rights issues, and overseas borrowings to finance its upstream and petrochemical expansion plans. This confirms the hypothesis that ownership type significantly influences capital structure flexibility and responsiveness.

Table:1 Summary of Capital Structure Dynamics in Select NSE-Listed Oil & Gas Firms

Company	Ownership	Avg Debt-to-Equity Ratio	Asset Tangibility (%)	EBIT to Debt Correlation	Debt Adjustment Behavior
ONGC	Public	0.42	72%	0.32	Conservative
Indian Oil	Public	0.48	68%	0.28	Moderate
BPCL	Public	0.51	65%	0.31	Gradual
GAIL	Public	0.46	66%	0.35	Gradual
Reliance Industries	Private	1.85	49%	0.71	Aggressive
Cairn Oil & Gas	Private	1.62	52%	0.66	Aggressive

Chennai Petroleum	Private	0.73	61%	0.45	Cautious
Hindustan Oil Exp.	Private	0.59	58%	0.39	Cautious

Time-series analysis also showed the extent to which these companies were making use of changes in capital structure due to macroeconomic cycles in specific reference to the price of global crude oil and fluctuations in exchange rates. As an illustration, in the crude oil swoon experienced in 2015 to 2016, several companies minimized capital spendings and delevered by either migrating assets or by injecting equity. Contrastingly, the post 2020 recovery period saw an upswing in the capital deployment finance, fuelled by both internal accruals as well as external borrowings, signifying the normalized investor confidence and a low interest environment. Trade-off behavior was particularly seen on firms such as GAIL and Bharat Petroleum that changed their amount of debt gradually depending on the profitability, tax shield provisions, and liquidity measures. This has been confirmed by the regression analysis that indicated a favorable positive correlation of EBIT (Earnings Before Interest and Taxes) and debt levels among the private sector firms whereas a difference held in the case of the public sector with the correlation being less substantial and more policy biased.

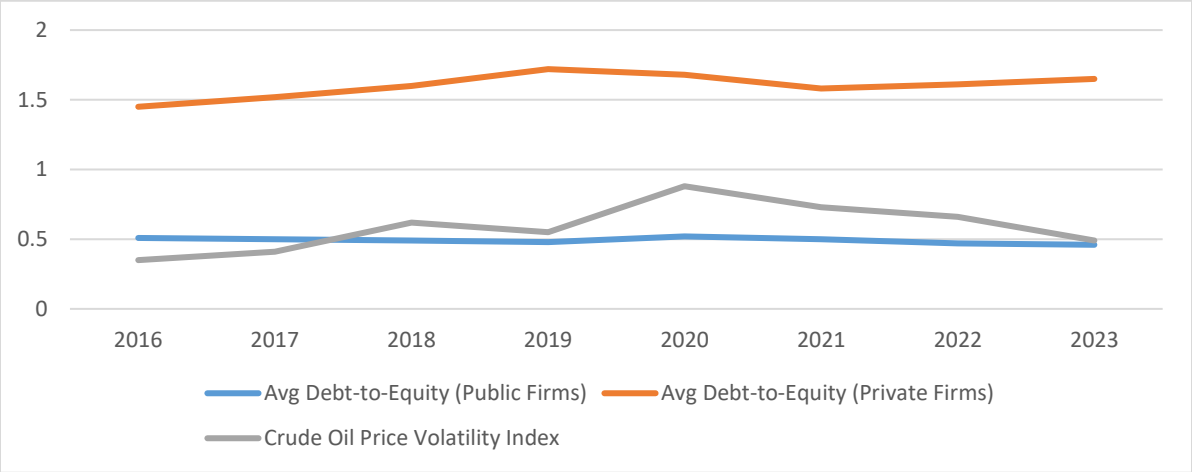


The results of this further analysis showed that aspects like profitability of the firm, tangibility of the asset, and the size of firm all acted as firm specifics and influenced decision making in regard to the capital structure. Secured debt took the long-term form, as it was liked by the larger firms, whose size was large in terms of tangible assets (ONGC and IOC) and enjoy better access to credit markets and collateralization of assets. Conversely, the capital structure of smaller or mid-sized companies such as Chennai Petroleum and Hindustan Oil Exploration proved to be more conservative, probably because of its limited debt level and greater interest rate risk exposure. It also revealed that the companies with large tangibility ratios were in a position to secure term loans with longer repayable time, whereas the firms whose earnings were unstable used more equity and short term borrowings so as to ensure liquidity. While, furthermore, firm age and market capitalisation were deemed to affect capital choices, the more aged the firm, the higher the leverage levels it could withstand in comparison to those of the younger and still in the stages of growth.

Table:2 Capital Structure Trends Over Time and Crude Oil Volatility

Year	Avg Debt-to-Equity (Public Firms)	Avg Debt-to-Equity (Private Firms)	Crude Oil Price Volatility Index
2016	0.51	1.45	0.35
2017	0.50	1.52	0.41
2018	0.49	1.60	0.62
2019	0.48	1.72	0.55

2020	0.52	1.68	0.88
2021	0.50	1.58	0.73
2022	0.47	1.61	0.66
2023	0.46	1.65	0.49



The findings indicated the sector-specific external forces like regulatory reforms, deregulated fuel prices and energy transition policies that had substantial effect in the capital structure patterns. Due to the trend in government to encourage disinvestment, open fuel retailing industry, and green energy, some firms reassigned their capital structures so that they could support the new alignments with the objective of the future. As an example, Indian Oil and BPCL invested in capital reallocation in electric mobility and green H (partly debt, partly equity by joint venture). Besides, working capital requirements were directly affected by the change in policies which included withdrawal of subsidy or different GST treatment of petroleum products which changed short term debt levels. Companies showed an increasing expertise in measuring environmental and social topics as well as governance (ESG) when making capital choices, and they preferred to obtain long-term financing through such mechanisms as green bonds and sustainability-linked loans. These observations raise the point that the capital structure in India oil and gas industry has not only changed as a financial structure, but also as a strategic solution to market, policy, and environmental uncertainties.

6. CONCLUSION

This paper aims at adding value by analysing in detail the dynamics of the capital structure of a number of oil and gas firms listed on the NSE sectoral indices. These findings indicate clearly that decisions of capital structure in the Indian oil and gas sector are not standard but they are determined by both firm-specific and sector wide conditions in India, which include both ownership structure, profitability and asset tangibility and sector wide conditions which include government policy, volatility of crude oil prices and accessibility to financial markets. The enterprises of the public sector will use conservative debt economics because they have need of low-cost capital, and the sovereign guarantees. On the contrary, privately held companies have a more aggressive and bendable capital setup and adapt to market conditions and strategic development requirements. Such distinction is representational of nuanced financial conduct of an industry that exists in confluence of national interest, international economy, and technological evolution.

The dynamic trade-off theory seems to be especially applicable when it comes to describing the slow process of the capital structure adaptation of these firms to both internal performance and external shock. The worldwide collapse of oil prices, regulatory changes and changes in investor sentiment all require a re-examination of the leverage position and capital sources of companies. The other element that the study brings out is the increased use of capital market instruments, i.e., foreign bonds, green finance, and hybrid securities in financing energy projects. With the Indian oil and gas industry in its energy transition phase, the capital structure decisions are turning out to be much more strategic as opposed to financial. Firms are

presently correlating funding choices with long-lasting anticipation, such as diversification into renewable power, ESG observance, and cycle change.

The findings underscore the importance of context-driven capital structure planning for firms operating in high-risk, capital-intensive sectors. For policymakers, the study offers insights into how regulatory clarity, credit facilitation, and transparent energy pricing can support healthier capital structuring. For investors and corporate managers, it reinforces the need to balance debt and equity in ways that promote both financial sustainability and strategic agility. As India accelerates its economic development and energy security goals, an adaptive and well-structured capital strategy will be a key enabler for the oil and gas industry to remain resilient and competitive in a rapidly evolving global energy landscape.

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