

-RESEARCH ARTICLE-

FINANCIAL AND NON-FINANCIAL PERFORMANCE EVALUATION – AN INTER-FIRM COMPARISON**Vimala Venugopal Muthuswamy**

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—Abstract—

This study employs and limits itself to three non-financial performance indicators and two financial performance indicators to evaluate the overall performance of the sample organizations under consideration. These are non-financial performance indicators about Operating Performance (Capacity utilization, Production of Crude Oil and Petroleum Products), Marketing Performance (Number of Retails Outlets, Market Share of Oil Company, and Number of LPG Customers), and Employee Performance (Sales, Profit, and Assets per Employee). Profitability Performance (NP Ratio, Return on Total Assets, and Return on Capital Employed) and Overall Growth Performance (Growth in Sales, Profit, and Assets) are the financial performance indicators. The primary objective of this research is to determine the degree to which the variables mentioned above influence the overall performance of the three sample energy corporations under investigation. Through this method, the present researcher can conduct an inter-firm comparison to identify, if any, performance variation over the ten years of observation. This process allowed the researcher to identify lapses and suggest immediate and long-term measures to eliminate bottlenecks caused by such lapses.

Keywords: Financial performance, Non-financial performance, Performance Indicators, Marketing performance, Operating performance, and employee performance

1. INTRODUCTION

An organization's financial and non-financial performance largely determines its success or failure (Gandhi and Shankar, 2014). Performance Evaluation measures an

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organization's performance during a specific period. It is the process of evaluating an organization's relative strengths and vulnerabilities to respond to opportunities and threats from both the internal and external environments (Yu and Ramanathan, 2008). This research seeks to examine, comprehend, and evaluate the overall performance of the public energy companies that supply the Indian subcontinent with oil. India is one of the largest importers of refined oil products, and natural gas is the foundation of its efforts to increase agricultural productivity through fertilizers, cleaner and more efficient heating, and cleaner fuel for transportation and power generation. Heavy reliance on the oil and gas sector for the transportation of people, goods, and services makes it the economy's lifeblood and, in the absence of viable alternative technologies, a prerequisite for attaining rapid economic growth. Rapid urbanization in India, where it is estimated that 60 percent of the population will reside in cities, will necessitate a greater increase in the provision of transport and cleaner culinary services, resulting in a greater reliance on oil and gas. Departing from oil and gas shortly would therefore be equivalent to departing from higher levels of development.

In their research, Vikas, V., and Bansal, R. (2019) provide benchmark target levels for Oil and Gas sector companies, allowing managers of relatively less efficient companies to concentrate on methods to improve efficiency. Enhancing a company's efficacy would benefit its shareholders, investors, and other stakeholders. As a result of India's continuous and robust economic development, India's energy demand is anticipated to grow faster than that of all other major economies. The oil industry is regarded as one of India's eight core industries, playing a significant role in determining the central decision variables in different sectors of the country's economy. Through its analysis and recommendations, the current research contributes to the extant knowledge on the Inter-firm performance evaluation concept, which benefits all the public and private oil companies in the Oil Industry and other similar industries in India.

1.1 I-Improving a Company's Efficiency would Benefit not only Indian Oil Sector

The eighth largest refinery capacity in the globe is located in India. As of EIA 2009, private corporations have increased market share in India's oil refining sector, although state-owned enterprises continue to dominate. There are 18 refineries in India, and approximately 10 of them are operated by the Indian oil corporation. It is the largest government-owned enterprise. Reliance Industries captured a substantial market share in the Indian hydrocarbon industry. In 1999, this private Indian company established a refinery. In January 2008, the country had 2.26 million bbl/d of crude oil, according to (OGT) 5. The capacity of the Jamnagar refinery is 1.24 million gallons per day. It is owned by Reliance Industries, a privately held Indian petroleum corporation. As demand for petroleum products is high, so are investments in India's refinery sector. In comparison to other Asian nations, India has consistently become a major destination for refined oil. Ike and Lee (2014) used DEA to evaluate the relative efficiency and productivity of 38 of the world's 50 largest NOCs and IOCs from 2003 to 2010. In

addition, a random-effects regression model was employed in the second stage analysis of environmental factors that influenced productivity and efficiency. The results show OPEC NOCs performed poorly, whereas large IOCs performed well. According to Deutsche Bank's study, India is the fifth largest nation in refinery capacity. India's share of global capacity is 3%. In future years may also increase to 45% in the global market. From 2011 to 2012, the refinery's capacity increased from 149 mtpa to 243 mtpa. India imports crude oil as an ultimate importer. According to the [IBEF \(2017\)](#) report[1], India's oil consumption increased by 8.3 percent annually to 21.27 lakh tonnes in 2016, compared to a global increase of only 1.5 percent. India is the world's third-greatest oil consumer and second-largest refiner in Asia. [Kumar, D., and Maheswaran, S. \(2013\)](#) investigate the return, volatility, and correlation spillover effects between the crude oil market and the various Indian industrial sectors (automobile, financial, service, energy, metal and mining, and commodities sectors) to determine optimal portfolio construction and risk-minimizing hedge ratios.

[Gandhi and Shankar \(2014\)](#) utilized DEA, MPI, and Bootstrapped Tobit Regression to assess the 2008–2010 economic performance of 18 Indian retailers. The DEA–CCR and BCC models identified six and seven firms as efficient, respectively. According to the MPI, 61 percent of all businesses improved during the period. Using bootstrapped Tobit regression, it was determined that the number of retail outlets and mergers and acquisitions are the primary determinants of the efficacy of retailers in India. [Yu and Ramanathan \(2008\)](#) measured the operational effectiveness of the British retail sector. [Moreno and SanzTriguero \(2011\)](#) analyzed the effectiveness and productivity of 12 retail sectors in Spain from 1997 to 2007. There were numerous obstacles facing the refinery industry.

Light petroleum products, such as diesel, gasoline, and aviation fuel, were in high demand. Product specifications were more stringent sulfur, aroma, and olefin are components of gasoline and diesel, specifically, sulfur, poly-aroma, and cetane number. The diesel market is twice as popular as the petroleum market. The primary objective is to narrow the disparity between supply and demand to produce high-quality diesel and gasoline. According to the research conducted by Zhang, there was a significant increase in demand for light petroleum products due to the development in the transportation industry. The author stated that the rise in oil demand is greater than the increase in oil reserves. There were two obstacles in the refining sector. First, there were petroleum product specifications regulations. Second, according to industry experts, India is a challenging destination for Middle Eastern oil exports, and it will be a growing exporter of refined products to Asia. It depends on crude oil imports for the region in particular, and there would be a secure crude oil supply.

2. REVIEW OF LITERATURE

Samad and Hassan (2000) evaluated the inter-temporal and interbank performance of Islamic banks (Bank Islamic Malaysia Berhad (BIMB)) in profitability, liquidity, risk and solvency, and community involvement over 14 years, i.e., 1984-1997. Comparing the efficacy of BIMB between the periods 1984-1989 and 1990-1997, this study is inter-temporal. To evaluate interbank performance, the study compares BIMB to two conventional banks (one smaller and one larger than BIMB) as well as eight traditional banks, using financial ratios to measure performance and F-test and t-test to determine the level of significance; the results revealed a significant increase in profitability from 1984 to 1997. Rebecca Das and S. N. Chakrabarthy (2001) merged physical and financial performance measures into a singular efficiency measure. This study was primarily based on the report submitted by the committee commissioned by the Ministry of Surface Transport, New Delhi, to compare the performance evaluation system used in Indian ports with that of the world's foremost major seaports. The variables used in the study were total administrative expenses, total revenue, total number of employees engaged in cargo handling activities, and cost-to-income ratio. Vijay Kumar (2002) analyzed the influence of various profitability determinants, including growth rate, vertical integration, and leverages, on overall performance. In addition, the author has incorporated financial variables to evaluate the overall performance. This research determined that effective management of inventories and other current assets significantly impacts overall profitability.

CengizErol, Hassan F. Baklaci, Berna Aydogan, and Tunc Gokce published "Performance comparison of Islamic (Participation) banks and commercial banks in the Turkish banking sector" in 2003. This investigation sought to compare the performance of conventional and Islamic banks in Turkey. In this effort, the researcher has obtained the necessary financial information from the audited balance accounts of approximately 19 Turkish traditional and foreign banks. Six economic indicators, including capital adequacy, assets quality, management adequacy, earning power, liquidity, and risk sensitivity, were utilized to evaluate the overall performance of nineteen sample banks in the pursuit of a comparative analysis of their overall performance. AbdusSamad (2004) analyzed "Performance of Interest-Free Islamic Banks Relative to Interest-Based Conventional Banks of Bahrain." This study aims to compare Bahrain's interest-free Islamic banks with conventional banks that charge interest from 1991 to 2001. In this study, the researcher employed nine financial ratios to determine the performance of both institutions, including profitability, liquidity risk, and credit risk. Through his research titled "Examining the factors that influence performance measurement and management in the Thai banking industry," Sriwan Tapnya (2004) analyzed the factors that determine performance and management in the Thai banking industry. This process utilized non-parametric analyses such as chi-square, kruskal-wallis, one-way anova, and the Mann-Whitney U test. To evaluate the performance of quantitative and qualitative methodologies in Thailand's banks, the Balanced Score Card technique will be utilized.

In his study titled "Performance Evaluation of Major Ports in India," M. Dhanusu (2005) analyzed the key performance indicators in the three main functional areas, namely operational, assets utilization, and financial administration, for the major ports in India. In this work, the author has sincerely tried to identify the factors that impact the overall performance most. Hamsalakshmi, R., and Manicham, M. (2005) attempted to analyze the financial performance of 34 software companies in India over five years, from 1997-98 to 2001-02. It examined the structure of liquidity, leverage, and profitability positions based on their five-year average results. During the observation period, its favorable working capital performance revealed its robust liquidity position. According to ICRA(2006), the study determined that fluctuations in financial performance during the observation period are entirely attributable to changes in sales, fluctuations in the cost charged by oil-producing nations, and the Government's economic policies regarding subsidy and price regulatory measures. Since the companies under study are public-sector oil companies, their primary objective is not to generate a profit but to provide an essential service to the general public. Jason MCGorman (2007), Liberty University Spring, investigated the efficacy of an economic performance measurement called Economic Value Added (EVA). This paper examined the significance of corporate governance and EVA, the importance of ethics in creating shareholder wealth, the advantages of using EVA as an internal control instrument for decision-making and assessing overall performance, and the profitability of ethics.

Hasnida Abdul Samat et al. (2010) investigated the performance measurement of a selection of Malasiya-based industrial enterprises. In this study, the authors included variables about three crucial areas: maintenance efficacy, asset performance, and financial performance. Variables such as service quality, timeliness of delivery, health and safety environment, productivity, skill and competence, maintenance task, etc., were used to evaluate maintenance performance. Sumathi Sidharth (2010) evaluated "The performance measurement by contemporary methods of corporate sectors in the Pune region." This study's primary objective is to determine human resource performance for organizational growth. In this endeavor, 140 respondents from 28 companies in and around Pune provided information to the researcher. The researcher has utilized the Balanced Score Card as a performance evaluation tool for data analysis; it has four perspectives: financial, internal business process, learning and development, and customer. Shri. I. N. Chatterjee(2010) assessed the financial performance of India's public sector enterprises in the petroleum and natural gas business before and after the administered pricing mechanism (APM) system. Kajal Chaudhary and Monika Sharma (2011) analyzed "Performance of Indian Public Sector Banks and Private Sector Banks – A Comparative Study" The primary objective of this study is to assess the performance of public and private banks' nonperforming assets (NPA) during 2011. Only after the 1990s have India's economic reforms become visible. Not only liberalization but also privatization and globalization significantly impacted the functioning of Indian banks following liberalization.

R. Ananthi and R. Sriram (2012) researched "Performance Evaluation of Selected Telecom Companies in India: A Taxonomy Approach." To evaluate the financial performance of the telecom companies, the required information was obtained from the secondary sources of the sample telecom companies for the observation period, i.e., 2004-05 to 2008-09. Taxonomy is used to classify companies based on a particular category. The method determined the classification based on the performance level of the company.



Framework Model:

3. OBJECTIVES OF THE RESEARCH

To evaluate the total performance using operating, marketing, and employee performance indicators for each of the three public sector oil companies under the study during the ten years observation period.

To study and analyze the factors that influence the financial performance of each public sector oil company.

To develop the composite performance model that explains and evaluates the overall performance and growth.

To conduct the inter-firm comparison across all three public sector oil companies pertaining to the operating, marketing, employee, and financial performance for the critical evaluation of overall performance and growth.

To identify the lapses and to suggest immediate and long-term measures to overcome such lapses

3.1 Hypothesis

H1: The operating performances do not vary between the three organizations during the observation period

H2: The performances of marketing do not vary between the three organizations under the study

H3: The Employee Performances among the three organizations do not vary significantly.

H4: The profitability performances of the three companies are not the same

H5: The overall performances do not show a significant variance among the three organizations during the period of research

H6: profitability mediates the relationship between marketing and overall performance and growth

H7: There is no relationship between the performance of the three functional areas (operational, marketing, and employee) and the profitability

H8: There is no relationship between the performance of the three functional areas (operational, marketing, and employee) and the profitability

H9: There is no relationship between the performance of the three functional areas (operational, marketing, and employee) and the profitability

4. RESEARCH METHODOLOGY

The market has only three competitors: government-owned public sector energy companies IOCL, BPCL, and HPCL. This study uses Data Envelopment Analysis and inferential statistical tools such as One-Way ANOVA, Correlation, etc., to evaluate the Marketing Performance of three oil companies (IOCL, BPCL, and HPCL) in the public sector in India. Consideration was given to the performance of the factors that determine the operational performance of the three sample units over a ten-year observation period. The analysis provides the results of descriptive, inferential, and financial tools about the performance of each of the three public sector oil companies, IOCL, BPCL, and HPCL, separately in the functional areas of Operational Performance, Marketing Performance, and Employee Performance, which ultimately revolve around financial performance. Operating performance measures results relative to utilizing assets and capabilities to achieve those results. Evaluation and comprehension of an organization's operational performance are crucial for determining its condition. Consistently high-performing organizations are always efficient operations, whereas low-performing organizations frequently have underlying issues driving their poor performance.

In the first step of the analytical procedure, the DATA EVOLUTION ANALYSIS (DEA) tool was utilized to evaluate the performance of the three public sector oil companies in terms of operating performance, marketing performance, and employee performance to evaluate their financial performance (profitability). The sole purpose of this procedure is to determine these businesses' performance levels over a ten-year

observation period. In addition, the commission has been classified as High, moderate, and low based on its degree. This process has enabled the present researcher to compare total performance (consolidated performance) and inter-firm performance in all three functional areas, including operating, marketing, employee performance, and financial performance. The hypotheses have been tested using one-way ANOVA to determine the significance of the performance levels' variance.

5. ANALYSIS & INTERPRETATION

5.1 Inter-Firm Analysis Using ANOVA

The operational performance indicators are extremely valuable and essential because they enable organizations to identify the areas in which they are lagging and devise strategies for overcoming these deficiencies. All stakeholders, including customers, employees, and investors, view an organization favorably if it has a high operational performance; consequently, all organizations strive to enhance their operational performance perpetually. To determine the operational performance of each of the three public sector oil companies, the present researcher has employed three core factors: Percentage of Capacity Utilization, Refinery-wise Crude Oil Processed (Throughput in TMT), and Refinery-wise Production of Petroleum Products in TMT.

Utilization of a company's manufacturing and production capabilities at any given time is called capacity utilization. The rate of capital utilization is also known as the operating rate.

The calculation for capacity utilization is as follows:

$$\text{Capacity Utilization} = \text{Actual Output} / \text{Maximum Output} \times 100$$

The production level of a refinery or group of refineries is represented by the Capacity Utilization Ratio, which is simply Refinery Throughput divided by Refining Capacity. The rate (percentage) of capacity utilization is a significant indicator for any organization, but especially for manufacturing organizations because it can be used to evaluate operating efficiency and provides insight into cost structure. It can determine the point at which unit costs increase or decrease.

H1: The operating performances do not vary between the three organizations during the observation period.

Table 1

Functional Area	Sample Units	Mean	SD	F Value	P Value
Operating Performance	IOCL	109529.41	12471.18	283.574	0.000**
	BPCL	45294.94	4767.74		
	HPCL	31724.36	2115.38		
Note: ** denotes a 1% level of significance					

Comparing the operational performance of the three oil companies over ten years, IOCL emerged as the most successful (= 109529.41), followed by BPCL and HPCL. However, the mean values must be compared with the corresponding standard deviation. Based on this comparison, HPCL has been deemed a consistent performer compared to the other two companies due to its low standard deviation (2115.38). While analyzing significance using the 'F' value (283,574), the above null hypothesis is rejected at the 1% level ($p=0.000$), indicating a substantial difference in operational performance levels between the three public sector oil corporations.

5.2 Analysis of Marketing Performance

Evaluation of marketing performance guides and directs future marketing activities and assists a business in achieving its intended objectives. However, evaluating marketing performance and its financial and non-financial impact on an organization's overall performance is complex and difficult. This analysis evaluates Marketing Performance from three perspectives: The number of Retail Outlets of the oil companies, the Percentage of Market Share of the oil companies, and the Number of LPG Customers (in Billions).

5.3 Inter-Firm Analysis Using ANOVA

H2: The performances of marketing do not vary between the three organizations under the study

Table 2

Functional Area	Sample Units	Mean	SD	F Value	P Value
Marketing Performance	IOCL	22677.44	3257.90	57.352	0.000**
	BPCL	11535.78	2227.23		
	HPCL	12078.40	2251.07		
Note: **Denotes 1% level of significance					

The above [table 2](#) represents the results of the three oil corporations about the marketing performance during the observation period of ten years. Compared to the other two oil companies, i.e., BPCL (=11535.78) and HPCL (=12078.40), the IOCL has emerged as the best-performing company (= 22677.44). Besides, the mean values are to be compared with its corresponding standard deviation; the BPCL is considered a consistently performing company for its low standard deviation (2227.23) compared with the other two companies. While analyzing the significance using the 'F' value (57.352), the above null hypothesis is rejected at a 1% level ($p=0.000$), meaning there is variance in the marketing performance levels among the three public sector oil corporations.

5.4 Analysis of Employee Performance

The success or failure of an organization is largely dependent on the performance of its employees. Each employee makes a unique and valuable contribution to the organization

through their work performance, which is one of the key metrics for evaluating its overall performance. Employees are unique and valuable assets that contribute to the successful operation of any form of organization. If asset utilization (employees) is implemented carefully to cultivate highly productive employees, an organization may outperform its competitors significantly. Such companies' sales, profit, and asset-to-employee ratios tend to be relatively higher than the industry average. This would help indicate whether employee productivity is increasing or decreasing. In addition, the proportions should be compared to the industry's competitors and their performance over the years.

In this analysis, the Employee Performance of public-sector energy companies in India is analyzed from three perspectives: Revenue per employee, Net Earnings per employee, and Assets (Total Tangible Assets).

5.5 Inter-Firm Analysis Using ANOVA

H3: The Employee Performances among the three organizations do not vary significantly.

Table 3

Functional Area	Sample Units	Mean	SD	F Value	P Value
Employee Performance	IOCL	17.230	3.202	1.528	0.000**
	BPCL	20.947	5.516		
	HPCL	18.895	5.001		

Table 3 represents the results of the three oil companies regarding employee performance during ten years study period, from the analysis clearly shows that BPCL has emerged as the best-performing company (=20.947), compared with IOCL (=17.230) and HPCL (=18.895). However, the mean values are to be compared with the corresponding standard deviation, according to which the IOCL is considered a consistently performing company for its low standard deviation (3.202) compared to the other two companies. While analysing the significance using 'F' value (1.528) the above null hypothesis accepted at 5% level ($p=0.224$), which means that the three oil companies performance has the same level of performance.

5.6 Analysis of the Evaluation of Profitability Performance

The profitability ratios are a basic method to evaluate an organization's performance. Profitability ratios are financial indicators researchers, analysts, and investors use to measure and assess an organization's ability to generate a profit concerning its sales, assets, operating expenses, and shareholders' funds over a specific period. They demonstrate how effectively a company utilizes its assets to generate profit and increase shareholder wealth. The profitability ratios are most useful compared to comparable businesses or previous periods. A higher profitability ratio indicates that the company is performing well in generating revenues, profits, and cash flow. The purpose of evaluating an organization's profitability is to determine

whether the levels of profitability attained by the organization are consistent with the levels that might be anticipated in a competitive market. In this analysis, the Profitability Performance of the public sector oil corporations in India is assessed from three perspectives: the Net Profit Ratio (NPR), the Return on Total Assets Ratio (ROTA), and the Return on Capital Employed (ROCE).

H4: The profitability performances of the three companies are not the same

Table 4

Functional Area	Sample Units	Mean	SD	F Value	P Value
Profitability Performance	IOCL	17.777	7.062	0.994	0.383
	BPCL	22.708	4.642		
	HPCL	19.519	10.830		

BPCL has emerged as the most profitable of the three oil companies over the ten-year study period (=22,708), followed by IOCL and HPCL. Comparing the mean values with the corresponding standard deviation yields the conclusion that BPCL is a company with consistent performance due to its low standard deviation (4,642) compared to the other two companies. The table 4 above's F value (0.994) indicates that the null hypothesis is accepted at the 5% significance level ($p=0.383$), indicating no variance between the three hydrocarbon corporations.

H5: The overall performances do not show a significant variance among the three organizations during the period of research

Table 5

Functional Area	Sample Units	Mean	SD	F Value	P Value
Overall Performance	IOCL	53.180	81.137	0.045	0.956
	BPCL	47.764	39.602		
	HPCL	55.374	46.490		

Table 5 depicts the aggregate growth performance of the three oil corporations over ten years, with HPCL emerging as the top performer ($X = 55,374$) compared to IOCL ($X = 53,180$) and BPCL ($X = 47,764$). In addition, the mean values must be compared with the corresponding standard deviation; BPCL has been deemed a consistent performer due to its low standard deviation (39.602) compared to the other two companies. The null hypothesis is accepted at the 5% significance level ($p=0.956$) based on the F value (0.045), indicating no difference between the three oil companies.

5.7 Test of Significance Using Product Moment Correlation - IOCL

H6: There is no relationship between the performance of the three functional areas (operational, marketing, and employee) and the profitability

Table 6

Variables	N	R value	P value	Positive/negative	Significance	Supported/not supported
Operating Performance Vs Profitability Performance	10	0.738*	0.015	+ ive	Sig.	Not supported
Marketing Performance Vs Profitability Performance	10	0.661*	0.040	+ ive	Sig.	Not supported
Employee Performance Vs Profitability Performance	10	0.0224	0.496	+ ive	Insig.	Supported
*correlation is sig. at 0.05% (two tailed)						

The results of Pearson's suggested product-moment correlation are shown in [Table 6](#). Examining the above effects, all three combinations exhibit only a positive correlation. At a 5% significance level, the above null hypotheses are refuted (do not support) because two functional areas, namely operating performance and marketing performance, exhibit a high significance level. Although there is a positive correlation between employee performance and profitability, the level is insignificant (Supported). Upon consolidating the results mentioned earlier, the operating and marketing performance significantly and positively impact IOCL's profitability performance. In other words, the operating performance (0.738) and marketing performance (0.661) substantially affect the profitability performance of IOCL. This interpretation demonstrates the existence of variance in the profitability performance level. There is no significant variation, however (0.496)

between employee performance and profitability performance, i.e., employee performance does not significantly contribute to the profitability performance of the IOCL in comparison with the other two functional areas

5.8 Test of Significance Using Product Moment Correlation - BPCL

H7: There is no relationship between the performance of the three functional areas (operational, marketing, and employee) and the profitability

Table 7

Variables	N	R value	P value	Positive/negative	Significance	Supported/not supported
Operating Performance Vs Profitability Performance	10	0.734*	0.016	+ ive	Sig.	Not supported
Marketing Performance Vs Profitability Performance	10	0.881**	0.001	+ ive	Sig.	Not supported
Employee Performance Vs Profitability Performance	10	0.756*	0.011	+ ive	Insig.	Not supported
Note: *denotes sig. at 0.05% (two tailed)						

The correlation between the performance of the three functional areas (operational, marketing, and employee) and BPCL's profitability is illustrated in [table 7](#) above. It is observed that the outcomes of all three sets of permutations exhibit a positive relationship. It is also observed that operating and employee performance are significant at 5%, whereas marketing performance is extremely significant at 1%. The null hypothesis is therefore rejected (not supported). Additionally, a strong and positive correlation can be observed between operating performance, marketing performance, and employee performance concerning profitability performance. It is recognized that the operating performance (0.734), marketing performance (0.881), and employee performance (0.756) have a significant impact on BPCL's profitability performance. Thus, there is evident variation in BPCL's profitability across its numerous versions.

5.9 Test of Significance Using Product Moment Correlation - HPCL

H8: There is no relationship between the performance of the three functional areas (operational, marketing, and employee) and the profitability

Table 8

Variables	N	R value	P value	Positive/negative	Significance	Supported/not supported
Operating Performance Vs Profitability Performance	10	0.865**	0.001	+ ive	Sig.	Not supported
Marketing Performance Vs Profitability Performance	10	0.709*	0.022	+ ive	Sig.	Not supported
Employee Performance Vs Profitability Performance	10	0.638*	0.039	+ ive	Insig.	Not supported
Note: *denotes sig. at 0.05% (two tailed)						

Understanding the relationship between the performance of the three functional areas (operational, marketing, and employee) and HPCL's profitability is illustrated in [table 8](#) above. It is observed that the outcomes of all three sets of permutations exhibit a positive relationship. In addition, it is observed that marketing performance and employee performance are significant at the 5% level, whereas operating performance is extremely significant at the 1% level. The null hypothesis is therefore rejected (not supported). Additionally, a strong and positive correlation can be observed between operating performance, marketing performance, and employee performance concerning profitability performance. It is well acknowledged that the operating performance (0.866), marketing performance (0.709), and employee performance (0.638) have a significant impact on HPCL's profitability performance. Consequently, there is evident variation in HPCL's numerous profitability performances.

6. MULTIPLE REGRESSION ANALYSIS

Table 9. Represents the Results of Multiple Regression – Profitability Performance – IOCL

Dependent Variable			Profitability performance (Y)		
Independent Variable			Operating performance (X1)		
			Marketing performance (X2)		
			Employee performance (X3)		
Model	R	R²	Adjusted R²	Std. Error of the estimate	F value
1.	0.829 ^(a)	0688	.621	4.83538	4.401*

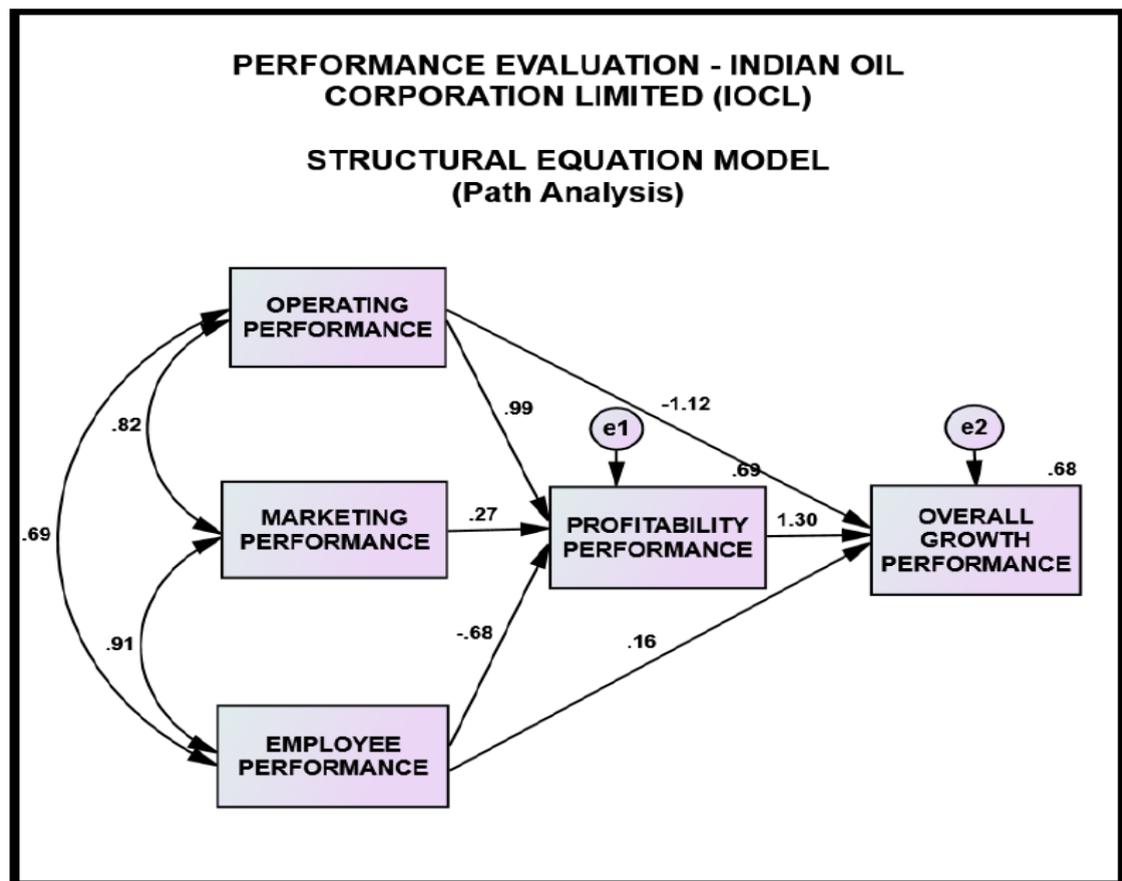
Table 10. Results of Performance Indicators on the Profitability Performance – IOCL

Determinants of Profitability Performance	Unstandardized co-efficients		Standardized co-efficients	T value	P value
	B	Std. Error	Beta		
(Constant)	-30.840	14.350		-2.149	0.075
Operating Performance (X1)	.001	.000	.991	2.390*	.014
Marketing Performance (X2)	.001	.002	.266	.368	.725
Employee Performance (X3)	-1.505	1.250	-.683	-1.204*	.44

Note: *Denotes significance @ 5% level.

The preceding table explains the impact of the study's operational performance, marketing performance, and employee performance indicators on the profitability performance (outcome variable) of IOCL. It is disclosed that the R² value is 0.688, indicating a 68.8% variance with the corresponding adjusted R² value of 0.621 across the three independent variables, excluding the marketing performance variable, which was found to be insignificant. At the 5% level, operational performance and employee performance are significant. The regression analysis indicates that the F-value of 4.401 is statistically significant at the 5% confidence level. Consequently, it can be concluded that the dependent variables operating performance and employee performance, significantly impact IOCL's profitability performance. Operating performance (t value = 2.390, p = 0.014) with the corresponding beta coefficient of .991 supports the existence of a positive relationship. In contrast, employee performance (t value = 1.204, p = .044) with the corresponding beta coefficient of -.683 endorses the presence of a negative relationship concerning IOCL's profitability performance.

6.1 Path Analysis of IOCL



6.2 Analysis of the Structural Equation Model of BPCL

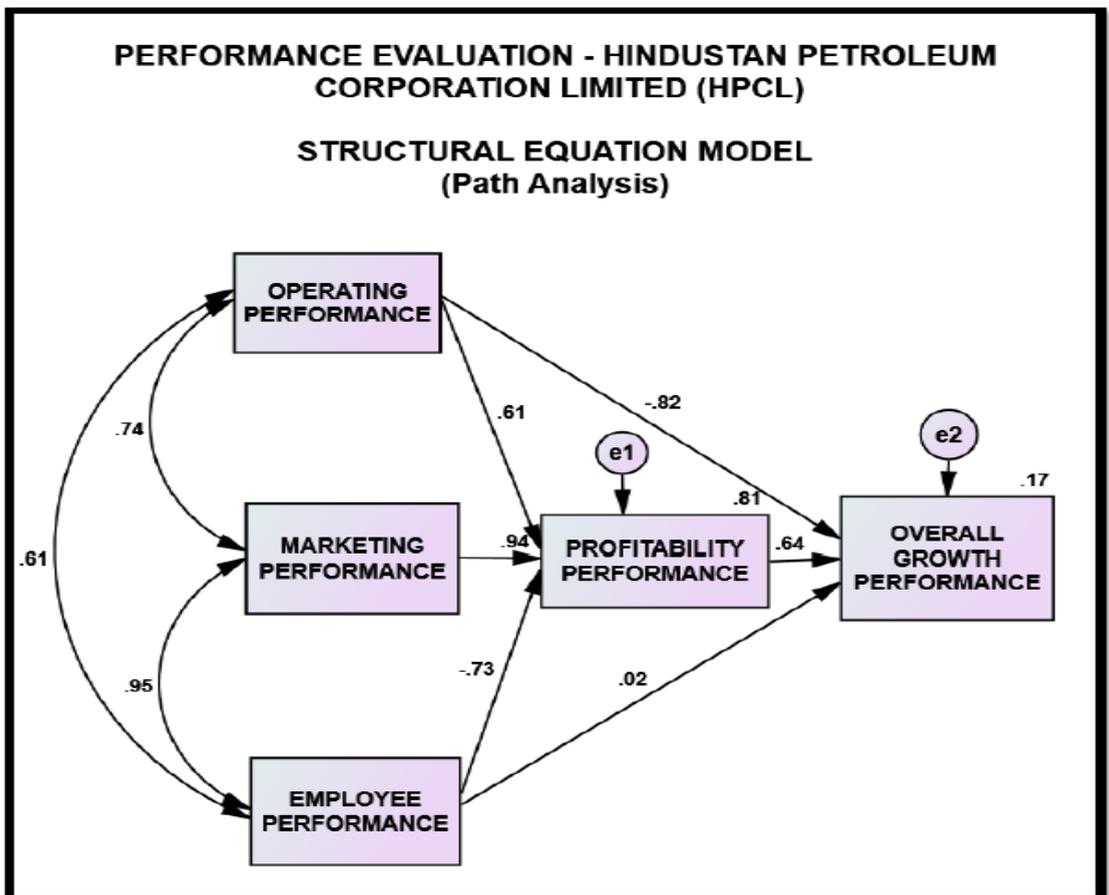
Table 11. Assessment of fit Indices – BPCL

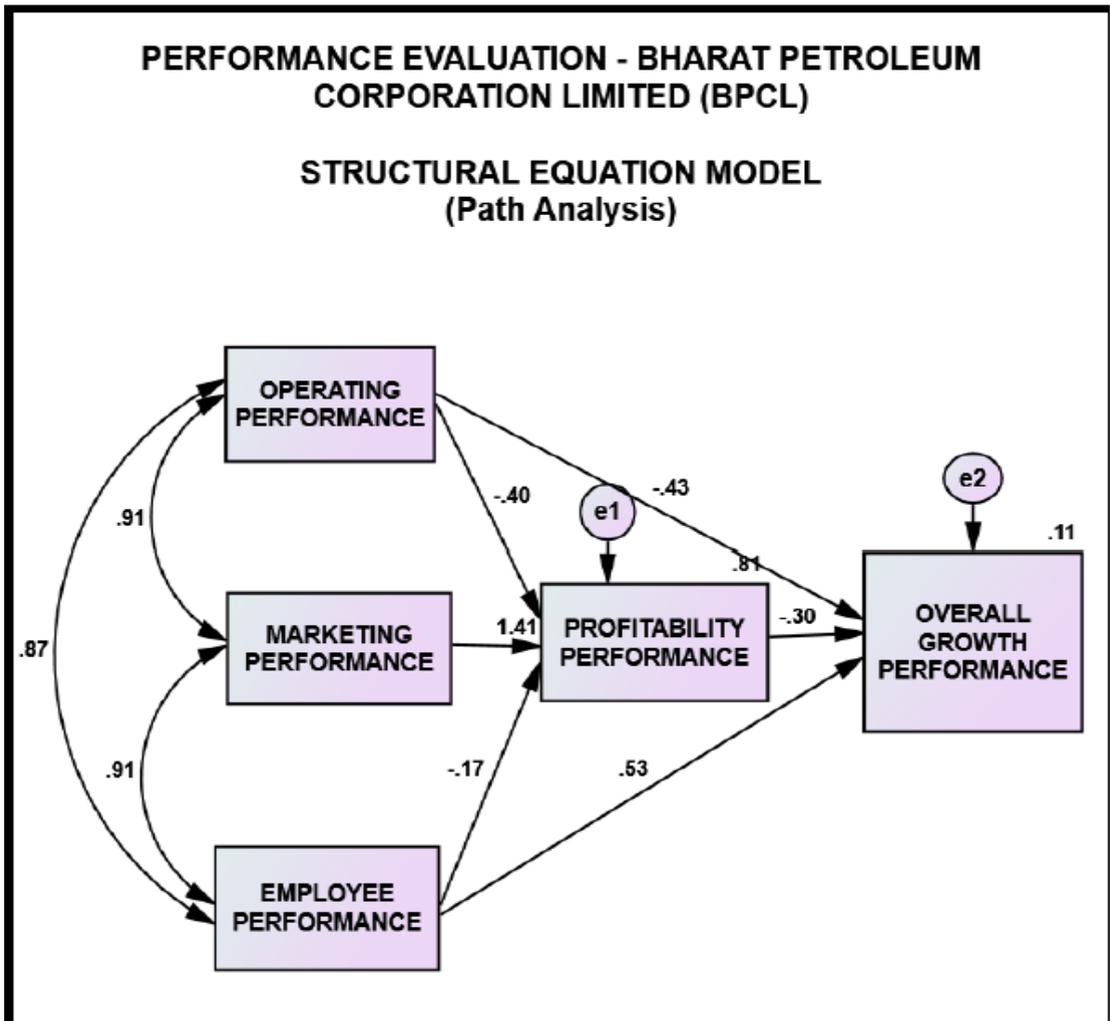
Measure	Fit indices
Chi-Square/df	0.008/1 (p=.930)
Comparative Fit Index	0.999
Goodness of Fit Index	0.998
Adjusted Goodness of Fit Index	0.995
Standardized Root Mean Square Residual	0.584
Root Mean Square Error of Approximation	0.001
Normal Fit Index	0.999
Tucker & Lewis Index	0.999

The Chi-Square value contrasts the overall fitness and the gaps between the sample and the covariance. It is less than 5 because the Chi-Square for quality of fit (CMIN/DF) is 0.008, and the degree of freedom is 1. The p-value (p = 0.930) is greater than 0.05,

indicating that it is not statistically significant. Thus, the phrase "Model fits well" is accepted. This model has a Comparative Fit Index of 0.999, which indicates a very good model fit and is more adequate. Calculating the square root of the difference between the sample covariance and the model covariance yields the Root Mean Square residual. This model's value of 0.584 is inadequate, as it should fall between .08 and .09. The Root Mean Square Error of Approximation measures the differences between the hypothesized model, parameter estimates, and population covariance. This model's value of 0.001 is less than 0.05 and is deemed acceptable. In this model, the Goodness of Fit Index is .998, and the Adjusted Goodness of Fit Index is .995, indicating an adequate and good model fit.

The Normed Fit Index compares the chi-squared values of the model under consideration to those of the null model. While the Tucker-Lewis Index evaluates sample size issues, the Normed Fit Index and Tucker-Lewis values in this model are 0.999 and 0.999, respectively, indicating that the model fits well.





7. DISCUSSION

Operating Performance contributes positively and significantly to the Profitability Performance and negatively and significantly to the Overall Growth Performance of Indian Oil Corporation Limited (IOCL), according to the analysis of the Structural Equation Model. Indian Oil Corporation Limited (IOCL)'s (Marketing Performance) relationship with Employee Performance is stronger than its relationship with Operating Performance. The Structural Equation Model reveals that, of the three Performance Indicators, only Marketing Performance significantly contributes to Profitability Performance. In contrast, none of the performance indicators significantly contributes (positively or negatively) to the Overall Growth Performance of Bharat Petroleum Corporation Limited (BPCL). The relationship between Marketing Performance and Operating Performance is stronger than the relationship between Operating Performance

and Employee Performance at Bharat Petroleum Corporation Limited (BPCL). The Structural Equation Model reveals that, out of three Performance Indicators, only Marketing Performance significantly contributes to Profitability Performance. In contrast, none of the performance indicators significantly contributes (positively or negatively) to the Overall Growth Performance of Hindustan Petroleum Corporation Limited (HPCL). The relationship between Marketing Performance and Employee Performance is stronger than the relationship between Operating Performance and Employee Performance at Hindustan Petroleum Corporation Limited (HPCL).

Periodically, the oil industry has a significant impact on the economy of our country. It is a crucial factor that influences the economic development of the nation. Because a failure in the performance of these organizations would paralyze the economy as a whole, evaluations of the performance of oil corporations in the public sector (with a significant market share) should be conducted regularly. Applying the necessary financial and non-financial variables and statistical techniques, the current study analyzes the overall performance of the three publicly traded hydrocarbon companies. Regarding operational performance, the findings indicate that HPCL is the most successful company, followed by IOCL, with BPCL hovering around third place. Once again, the IOCL outperforms the other two corporations in terms of its marketing performance. In employee performance, the HPCL and BPCL jointly exceeded the IOCL. BPCL is positioned ahead of IOCL and HPCL in terms of profitability. This study concludes that IOCL has outperformed BPCL and HPCL over a ten-year observation period by superior performance in all four functional areas. In conclusion, the research revealed that the financial performance of the main oil companies in India included in the study was a moderate and needed improvement in the upcoming time periods. The researcher recognizes that it is ethical to provide valuable recommendations as a result of the research to assist the management in resolving a few issues and enhancing the performance of various factors that may contribute to the overall performance of the companies.

It becomes obligatory for the management of an organization in any industry to monitor and evaluate its financial and non-financial performance indicators regularly. This is the proactive approach to addressing various issues. With this in mind, the present study is an earnest effort by the researcher to gain a deeper comprehension of the multiple levels of performance and their corresponding indicators within the selected oil companies included in the study. This study contributes to closing a void in financial management by periodically evaluating financial and non-financial performance aspects. This would assist these hydrocarbon companies in sustaining a sustainable growth rate. This research finding is also a significant contribution to the oil companies included in this study and numerous industries across all sectors that aspire for continuous performance enhancements. The problems listed in the survey can also be the focus of attention for other businesses. The study describes methods for analyzing financial and non-financial performance and examines several performance factors, including these oil companies'

operating, marketing, employee, profitability, and overall development. This could also be a simulation for other organizations. Such intra- and inter-firm comparisons aid other businesses in gaining a deeper understanding and conducting market research for sustainable growth. This researcher's extraordinary effort to establish a comprehensive theoretical framework that contributes to the development of the Indian economy is deemed exceptional.

8. CONCLUSION

Performance always refers to the total version, which in actuality depends on a multitude of factors. This study employs only fifteen crucial variables to determine overall performance. All variables play a role in determining total performance, so it has become imperative to implement a comprehensive list of variables to comprehend how these variables affect overall performance. Therefore, it is possible to determine the degree of influence on overall performance through additional research. As a result of the present study's emphasis on inter-firm comparison, all three public sector companies were analyzed. However, it is also possible to conduct additional research on each company. In addition, research can be conducted by comparing the performance of public and private-sector energy companies. In this investigation, the technical aspects are completely ignored. It is also possible to conduct additional research on technical aspects regarding cost-benefit analysis.

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