
SUFFERINGS OF PETROLEUM REFINERIES DURING POST APM PERIOD IN INDIA: AN ANALYSIS

Dr. Pallakshi Bordoloi

M.Com., Ph.D., Department of Commerce, Dibrugarh University, Dibrugarh

Email id: agrip1989@gmail.com

Abstract: The Indian petroleum industry plays a crucial role in the country's economy and has a rich history dating back to the discovery of crude oil in Assam. Over the years, Indian refineries have not only met domestic demand for petroleum products but have also become major exporters of high-quality products, with a total refining capacity of 248.9 MMTPA. This paper aims to evaluate the financial performance of Indian refineries based on their Gross Refinery Margin and identify reasons for any deficiencies in their performance. The study found that Indian refineries are under pressure to reduce operating costs to increase profits, and the comparison of GRMs among different refineries is challenging due to various factors. To improve GRM and ensure profitability and competitiveness, refineries must prioritize operational efficiency through the judicious use of resources, minimizing waste, and optimizing quality. Strategic economic and technological factors can enhance the performance of Indian petroleum refineries, ultimately leading to increased production and reduced costs.

1. Introduction

The Indian petroleum industry is vital to the country's economy and has a long history dating back to the discovery of crude oil at Digboi, Assam. Indian refineries not only meet the domestic demand for petroleum products but also produce and supply polymers and petrochemicals for downstream industries. With over 100 years of experience, the Indian petroleum industry has seen significant growth, transforming from a deficit scenario in 2001 to becoming a major exporter of high-quality petroleum products. India now boasts a total refining capacity of 248.9 MMTPA, making it a global refining hub. Both public and private sector refineries have been established, with the North East region of India emerging as a refining hub with four refineries. This region also leads in onshore crude oil production, contributing over 24% of the total production in India. The objective of this paper is to evaluate the financial performance of Indian refineries based on their Gross Refinery Margin and identify the reasons for any deficiencies in their performance. **(Advantage Assam Report 2018)**

2. Review of Indian petroleum refineries

Digboi refinery was the first Indian refinery established in 1901 with a capacity of 0.50 Million Metric Tonnes per annum (MMTPA). After independence, modern refineries were set up by Esso in Mumbai in 1954, followed by others such as Burmah Shell, Caltex, and HPCL. Currently, there are 23 refineries operating in India under different companies, both in the public and private sectors, with a total capacity of 248.866 Million Metric Tonne (MMT).

Table 1: Numbers of Refineries under Different Companies in India

Sl. No.	Refinery Location	Name of the Company	Name Plate Capacity (MMTPA)*
PSU Refineries			
1	Digboi - 1901	Indian Oil Corporation Ltd.	0.650
2	Guwahati – 1962		1.000
3	Barauni – 1964		6.000
4	Koyali – 1965		13.700
5	Bongaigaon – 1974		2.350
6	Haldia – 1975		8.000
7	Mathura – 1982		8.000
8	Panipat – 1998		15.000
9	Paradip - 2016		15.000
10	Manali – 1965	Chennai Petroleum Corporation Ltd. (CPCL)	10.500
11	Nagapattinam - 1993		0.000
12	Mumbai – 1954	Hindustan Petroleum Corporation Ltd. (HPCL)	7.500
13	Visakhapatnam – 1957		8.300
14	Mumbai – 1955	Bharat Petroleum Corporation Ltd. (BPCL)	12.000
15	Kochi - 1963		15.500
16	Numaligarh – 2000	Numaligarh Refinery Ltd.	3.000
17	Mangalore – 1996	Mangalore Refinery and Petrochemicals Ltd. (MRPL)	15.000
18	Tatipaka, AP - 2001	Oil and Natural Gas Corporation Ltd. (ONGC)	0.066
Total			141.566
Joint Venture Refineries			
19	Bina – 2011	Bharat Oman Refinery Ltd.	7.800
20	Bathinda - 2012	HPCL Mittal Energy Ltd.	11.300
Total			19.100
Private Sector Refineries			
21	DTA-Jamnagar - 1999	Reliance Industries Ltd.	33.000
22	SEZ-Jamnagar - 2008		35.200
23	Vadinar - 2006	Nayara Energy (Formerly Essar Oil Ltd.)	20.000
Total			88.200
GRAND TOTAL			248.866

* MMTPA - Million Metric Tonnes Per Annum

Source: <https://mopng.gov.in/en/refining/refining-capacity>

3. Review of Literature

The pricing mechanism of petroleum products is a significant challenge for petroleum refiners. It is not only a problem that needs to be addressed, but it is the most weighty challenge with diverse effects. The pricing of petroleum in India has a notable impact on the investment returns and profitability of national oil companies, creating obstacles in optimally utilizing refining capacity and leading to supply-demand imbalances in the country (Olowonirejuaro, 2013). The tax is a significant obstacle for oil companies. The impact of tax affects the overall profitability of the companies at various levels. It was recommended that companies should engage in strategic tax planning to minimize the tax burden, thus maximizing the company's profit (Das, 2013). The petroleum industry has potential in both domestic and international markets. The primary constraints in India's petroleum industry are related to infrastructural development, such as the lack of proper storage facilities, fluctuating import prices, and limited refining capacity. Additionally, Sharma studied the short-term and profitability positions of leading oil and petroleum companies in India and found that the financial position of Oil and Natural Gas Company (ONGC) is highly satisfactory (Sharma, 2012). It was uncovered that Indian oil companies faced obstacles and limitations during the implementation of the Administered Pricing Mechanism (APM) and did not progress as much as global oil companies. The upstream companies, such as ONGC and Oil India, were able to generate higher profits in the post-APM period compared to the APM period. Similarly, the downstream refineries and marketing companies also experienced improved financial performance initially during the deregulation period, enabling them to expand their business more rapidly compared to the APM period. In conclusion, the study found that growth during the APM period was slow and organic. In his research thesis, (Chatterjee, 2010). The Indian oil refineries should increase their imports of crude oil to maximize their capacity utilization, as running a refinery at low throughput is not cost-effective. Additionally, it was recommended that Indian refiners should implement cultural and behavioral changes to enhance their economic performance (Joshi, 2021)

4. Objectives:

- i. To examine the financial struggle of Indian Petroleum refineries during post APM period in India.
- ii. To find out the reasons of such struggling of Indian Petroleum refineries during post APM period.

5. Research Questions:

- i. How did the Indian refineries suffer during post APM period?
- ii. What are the reasons of such sufferings of these refineries?

6. Research Methodology

6.1 Technique of Data Analysis

The study employs an analytical approach to achieve its objectives. The researcher has utilized data collected from various sources and analyzed it using simple statistical tools to conduct a critical evaluation of the material.

6.2 Data Collection

The research is based on secondary data obtained mainly from the Petroleum Planning and Analysis Cell (PPAC) website. The PPAC, connected to the Ministry of Petroleum and Natural Gas, provides monthly and quarterly publications with accurate figures and information about petroleum products and their pricing mechanism. In addition, data were gathered from reports of Expert Groups established by the Government of India to provide advice on the Pricing Methodology of petroleum products, published government reports, articles, journals, research papers, books, newspapers, and official company websites. All sources were documented and referenced in the study.

6.3 Significance of the study

Petroleum refineries are vital in meeting the nation's fuel needs and have a direct impact on the prices of all goods. Given its crucial role in the petroleum industry, it is essential to evaluate the financial health of India's refineries and identify any operational deficiencies. This research brings attention to the obstacles encountered by Indian refineries, highlighting the sector's economic significance. Additionally, the study concentrates on the refineries in northeastern India, which receive distinctive financial benefits from the government in the form of excise duty concessions, setting them apart from other refineries in the country.

7. Analysis & Discussion

Being a part of the pricing system of petroleum products, most of the refineries suffer. During APM period adoption of pricing mechanism by the government of India pushed the refineries in a situation where it was very difficult for them to survive. Presently, there are 23 refineries under different companies in India operating both in public and private sector with 257.2 Million Metric Tonne (MMT) capacity as shown below:

Table 2: Numbers of Refineries under Different Companies in India

As on 01.04.2019	No. of Refineries	Capacity (MMT)
IOCL	9	71.8
HPCL	3	30.9
BPCL	3	36.5
CPCL	2	10.7
NRL	1	2.9
ONGC	2	16.3
RIL	2	69.2
NEL	1	18.9
Total	23	257.2

Source: Ready Reckoner Report of Govt of India.

Pricing methodology has a significant impact on Indian refineries, as it is reflected in their profitability. The financial health and growth of a business can be seen in its profitability. The Gross Refinery Margins (GRMs) achieved by the refineries is an indicator of their performance, calculated as the difference between the cost of input (crude oil) and the total value of the petroleum products produced. For example, if a refinery purchased one barrel of crude oil at \$80

and sold a basket of products for \$110, the GRM would be \$30. It's important to note that the profitability of Indian PSU refineries, most of which were built between 1901-1985, cannot be compared with modern, high-tech refineries set up in the private or joint sector. The varying capacities and locations of these refineries make comparisons difficult, and the benchmark for measuring their profitability is the Singapore GRM. The Singapore benchmark margin model comprises of a particular type of Crude, a given configuration of a refinery and a predetermined product slate (**Report of Expert Group on Pricing Methodology 2013**).

The comparison of GRM between different refineries across the country is not feasible due to variations in their quality. PSU refiners' GRMs are instead compared with the Benchmark refinery to assess their financial performance, considering the quality of their products and technologies. Older PSU refineries, with depreciated assets and lower GRMs, are contrasted with modern refineries using advanced technology, producing better quality products and achieving higher GRMs. Refineries located in coastal areas have an advantage over those in non-coastal areas, as they have the flexibility to import crude oil and petroleum products, or export products to other countries. Additionally, PSU refiners face limitations such as processing flexibility, remote locations requiring additional transportation costs, and limited export capabilities. Consequently, some Indian PSU refineries have struggled to achieve the Singapore Benchmark GRM.

After the dismantling of the APM, the ad hoc arrangement of the IPP for Petrol, Diesel, domestic LPG, and PDS Kerosene at the refinery level followed. This arrangement allowed the refining sector to strengthen itself by increasing capacity to produce more. Although various changes in pricing policy were made, the refineries were not significantly affected due to other reasons. However, the decision to shift the price methodology from IPP to TPP did have an impact on refineries. Of the pricing mechanisms, TPP and EPP were the two pricing methodologies that affected the refineries. Although IPP was favorable for refineries, it was unfavorable for consumers and other stakeholders. From 2006 to 2014, Indian PSU refineries suffered low GRMs compared to the Singapore Benchmark. The GRMs of PSU refining companies with the Singapore Benchmark are provided below.

Table 3: Comparison of GRMs of Indian PSU Refineries & Singapore Benchmark (\$/bbl)

Companies	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
*/**IOCL	3.59	3.82	2.94	3.59	3.94	0.27	5.06	7.77	8.49
*BPCL	3.33	4.53	3.16	5.02	4.38	3.62	6.59	5.26	6.85
*HPCL	2.70	5.23	2.35	2.08	3.44	2.84	6.68	6.20	7.40
CPCL	4.75	5.02	4.16	0.99	4.06	1.97	5.27	6.05	6.42
MRPL	5.51	5.96	5.60	2.45	2.67	(0.64)	5.20	7.75	7.54
** NRL	4.31	6.67	5.80	4.83	6.98	16.67	23.68	28.56	31.92
Singapore (Benchmark)	3.53	5.20	8.27	7.74	5.62	5.80	7.52	5.83	7.23

Source:Ready Reckoner Reports 2014 to 2018

Note:* Average GRM of all the refineries under the company has been taken.

** GRM includes excise duty benefit for North East refineries viz. Guwahati, Digboi, Bongaigaon under IOCL and NRL, Numaligarh.

The table above displays the Gross Refinery Margins (GRMs) for various refineries owned by different companies. The North East refineries have notably higher GRMs than other refineries due to their entitlement to retain 50% of the Excise Duty collected on the sale of POL products. From 2009-10 to 2015-16, none of the PSU refining companies consistently achieved the Benchmark GRM, likely due to operational difficulties. Following the complete abolishment of the TPP mechanism in 2014-15, some companies' performance improved, and by 2016-17, some even achieved the Singapore GRM Benchmark. The Government considered implementing an EPP mechanism at the refinery level for Petrol and Diesel but faced objections and limitations from the refineries. The oil companies argued that EPP-based pricing would be disadvantageous to domestic refiners, potentially causing substantial losses and making them unviable. Consequently, the Government did not implement EPP and kept the Refinery Gate Price for Petrol and Diesel market-determined.

8. Conclusion:

The findings of the study revealed that Indian refineries were facing significant pressure to reduce operating costs in order to increase profits. The comparison of GRMs among different refineries was challenging due to variations in configurations, capacity utilization, and other constraints. The fluctuation of GRM is influenced by various factors such as pricing methodology of final products, inventory loss, and low demand. To improve the GRM and ensure profitability and competitiveness, refineries must prioritize operational efficiency. This involves using available resources judiciously and profitably, leading to increased production and reduced costs. It also serves to minimize waste and optimize the quality of goods and services. Therefore, a strategic blend of economic, technological, and other factors can enhance the performance of any manufacturing unit, and Indian petroleum refineries are no exception to this rule.

References:

1. Olowonirejuaro, R. (2013). What are the challenges and future prospects of India's Petroleum Products refineries?. Genesis of Indian Petroleum Industry Business Essay. University of Dundee. United Kingdom. pp.11-12.
2. India's express to ASEAN. (2018). Advantage Assam Report. Ministry of Petroleum and Natural Gas. Government of Assam.
3. Das, R.C. (2013). A Study on Financial Performance of Indian Petroleum Industry. Ph.D. Thesis. Assam University. Silchar. pp.267-268. Retrieved via online access from the website www.shodhganga.inflibnet.ac.in. Accessed on 15/09/2021.
4. Sharma, A. (2012). Financial Analysis of Oil and Petroleum Industry. Research Paper. International Journal of Research in Commerce, IT & Management. 2(6). pp.90-97.

10. Das, R.C. (2013). A Study on Financial Performance of Indian Petroleum Industry. Ph.D. Thesis. Assam University. Silchar. pp.267-268. Retrieved via online access from the website www.shodhganga.inflibnet.ac.in. Accessed on 15/09/2021.
5. Chatterjee, I. N. (2010). Assessing Financial Performance of Indian Public Sector Companies Engaged in the Business of Petroleum and Natural Gas during Pre and Post Administered Pricing Mechanism System. Ph.D. Thesis. Symbiosis International University. Pune. pp.338-344. Retrieved via online access from the website www.shodhganga.inflibnet.ac.in. Accessed on 14/02/2021.
6. Joshi, J.M. (2021). The operational efficiency of Indian petroleum refineries. Ph.D. Thesis. University of Petroleum and Energy Studies. Uttarakhand. Extracted from <https://www.researchgate.net>. Accessed on 20/10/2022.
7. Muller, R. (2007). Shifting Global Products Specs Push more Refinery Investment. Oil and Gas Journal. pp. 44-48.
8. Kumar, G.P. (1997). A Critique of the Petroleum Pricing Policy of Government of India. Ph.D. Thesis. Mahatma Gandhi University. Kerala. Extracted from <https://shodhganga.inflibnet.ac.in>.
9. Zhang, Y. (2008). An analysis of Asia's Petroleum Refining Industry: Changes and Challenges. Institute of Electrical Engineers. Japan.
10. Pirog, R. (2007). Petroleum refining: Economic Performance and Challenges for the Future. Congressional Research Service Report for Congress. pp.5-27. Available at <https://www.everycrsreport.com>. Accessed on 14/01/2020.
11. Balakrishnan, H. and Raman, N. (2005). Financial Performance of Public Sector Petroleum Industry. Ph.D. Thesis. Bharathiar University. Tamil Nadu. pp.130-135. Available at www.shodhganga.inflibnet.ac.in. Accessed on 14/05/2021.
12. Report of the Expert Group to Advise on Pricing Methodology of Diesel, Domestic LPG and PDS Kerosene, (2013). Government of India. New Delhi. Extracted from www.ppac.gov.in.
13. Ready Reckoner Reports (2010-2021). Snapshot of India's Oil & Gas Data. Petroleum Planning and Analysis Cell. Ministry of Petroleum & Natural Gas. Government of India. pp.53-54. Available at www.ppac.gov.in.
14. Report of the Committee on Pricing and Taxation of Petroleum Products, (2006). Government of India. New Delhi. pp.12-15. Available at www.ppac.gov.in.
15. International Energy Agency. (2009). Petroleum Prices, Taxation and Subsidies in India. pp. 7-8. Retrieved via <https://www.iea.org/reports>.

16. Report of the Committee on Pricing and Taxation of Petroleum Products, 2006. Government of India. New Delhi. pp.12-15. Available at www.ppac.gov.in. Accessed on 14/06/2018 at 5:25 p.m.
17. Garg, V.; Sharma, S.; Clarke, K. and Bridle, R.(2017).Kerosene Subsidies in India: The status quo, challenges and emerging path to reform. *Policy Brief*. International Institute for Sustainable Development.pp.4-5. Available at <https://www.iisd.org>.