

Performance of Motor Spirit (Petrol) Exports from India

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Abstract

This study paper focuses mostly on performance of India's motor spirit export. India's exports of motor spirits experienced a positive growth rate. The motor spirit export has demonstrated a high level of instability. After imposing restrictions a year ago, the government has extended restrictions on the export of motor spirits to ensure that refined fuel is available in the domestic market. Oil refiners are mandated by the government to sell at least 50 per cent of their annual volume of motor spirit to the domestic market. Private oil companies discouraged from importing Russian oil for export to other countries, including many EU countries, by the move. The curbs were first put in place after the Russia-Ukraine war that started on February 24, 2023, as the non-state refiners started taking advantage of cheap oil coming from Russia to garner maximum profit. The government earlier said that the prices of motor spirit have not been increased by public sector Oil Marketing Companies (OMCs) since April 6, 2022, despite record-high international prices. If the governments take steps to reduce the restriction on motor spirit exports, the motor spirit exports could be increased to a desired level. Moreover, by the result of increased motor spirit exports the more foreign exchange reserve could be accumulated.

Keywords: Motor, Exports, Growth, Instability, Spirit, Oil, Gasoline, Petrol.

Introduction

Petrol or Gasoline, in technical terms, is called Motor Spirit (MS) or Automotive Gasoline. The term Motor Spirit (MS) or Automotive Gasoline is used in technical terms to refer to Petrol or Gasoline. From the late 19th Century to the 1930s, petrol was primarily described by British people using this term. Petrol is normally produced by refineries by the fractional distillation of crude oil, with further treatment including the addition of multifunction additives to enhance its Octane rating (number) and other properties. The engine performance under various operating conditions is satisfactory due to the balanced combination of hydrocarbons, which is technically a complex mixture. Petrol's resistance to knock is measured by its octane number, which is a key parameter. In a spark-ignition engine, the air-fuel mixture gets heated during the compression cycle and is then triggered by the spark plug to burn rapidly, as per the engine design requirements. The engine can extract more mechanical energy from a given mass of air-fuel mixture with higher compression ratios, resulting in higher thermal efficiency. Fuels with a higher octane rating are typically needed for gasoline engines with higher design compression ratios. Use of petrol with a lower than prescribed octane number may cause the air-fuel

mixture to prematurely self-ignite before the ignition system sparks, with a characteristic "knocking" or "pinging" sound, which is undesirable as it may damage engine components due to higher pressures. Automotive OEMs optimize their individual engine design based on various factors which include fuel efficiency, engine compression ratio, components engineering design; specifications of the fuel etc., widely used automobile brands in India require Petrol of minimum 91 Octane rating, which is available throughout HPCL's Retail Outlet Network in India. In high-performance cars and motorcycles, higher-octane gasoline, such as power 99, is used, which is India's highest octane gasoline.

The petrol sold at HPCL Retail Outlets is delivered directly to the automobile fuel tank according to regulatory requirements. The Indian standard for motor gasoline and gasoline-oxygenate blends, IS 2796: 2017, and is met by the petrol marketed by HPCL. The fuel specifications necessary to meet emission standards BS-VI standards are part of the government's policy guidelines. HPCL's retail outlet network market is promoting the implementation of increasingly rigorous standards, in accordance with the policy timelines for the geographical region. An oxygenate, ashless organic compound (such as alcohol or ether) can also be used to supplement the gasoline. In relation to the National Policy on Biofuels issued by the Ministry of New & Renewable Energy (Government of India), BIS has published specifications for "Petrol with 10 per cent Ethanol". The engine can burn the fuel more completely with the oxygen contained in the ethanol molecule, which results in fewer emissions and a reduction in environmental pollution.

Review of Literature

A review by **Onyeneken Cyprian Eneh (2011)**, aimed at updating and enriching the literature on the meaning, uses, origin, formation, exploration, processing and products of petroleum, major petroleum producing countries, octane number, the petrochemical industry and petroleum and the environment. It used the table research method to synergise dated and current reports. Petroleum or rock oil probably originated from underground organic matter or due to chemical reactions in the sky thousands of million years ago. It consists mainly of a mixture of gaseous, liquid and solid hydrocarbons which are broken into various products by fractional distillation during refining. From the medieval times, petroleum has been a source of energy and recently predominated the synthesis of organic compounds. Petroleum exploration and use have some environmental challenges.

Louis Ederington, Chitru Fernando & Seth Hoelscher (2018), have reviewed the large body of the empirical literature focusing on the relation between petroleum product prices and oil prices and discuss the evidence on the direction of causality between crude oil prices and petroleum product prices. In addition, we survey the literature on the much-debated question of whether petroleum product prices respond differently to increases versus decreases in oil prices, which Bacon (1991) labeled the "rockets and feathers" phenomenon.

Methodology

The aim of this paper is to study the performance of India's motor spirit exports during the period from 2000-01 to 2022-2023. For this purpose, the secondary data on India's motor spirit exports have been collected from Ministry of Petroleum & Natural Gas, Government of India, Indiastate, Economics Survey and Handbook of Statistics of Indian Economy. The collected data were analyzed with the help

of econometrical tools such as Linear Trend, Semi-log, Compound Growth Rate and Cuddy Della Valle Index. By using SPSS 19 software, the analysis has been done.

Linear Trend

$$Y = \beta_0 + \beta_1t + U_t$$

Semi-Log

$$\text{Log } Y = \beta_0 + \beta_1t + U_t$$

Compound Growth Rate

$$\text{CGR} = [(\text{Antilog } b - 1) \times 100]$$

Cuddy Della Valle Instability Index

$$I = CV \cdot \sqrt{1 - \bar{R}^2}$$

Results and Discussions

The following table depicts India’s motor spirit exports from the year 2000-2001 to 2022-2023.

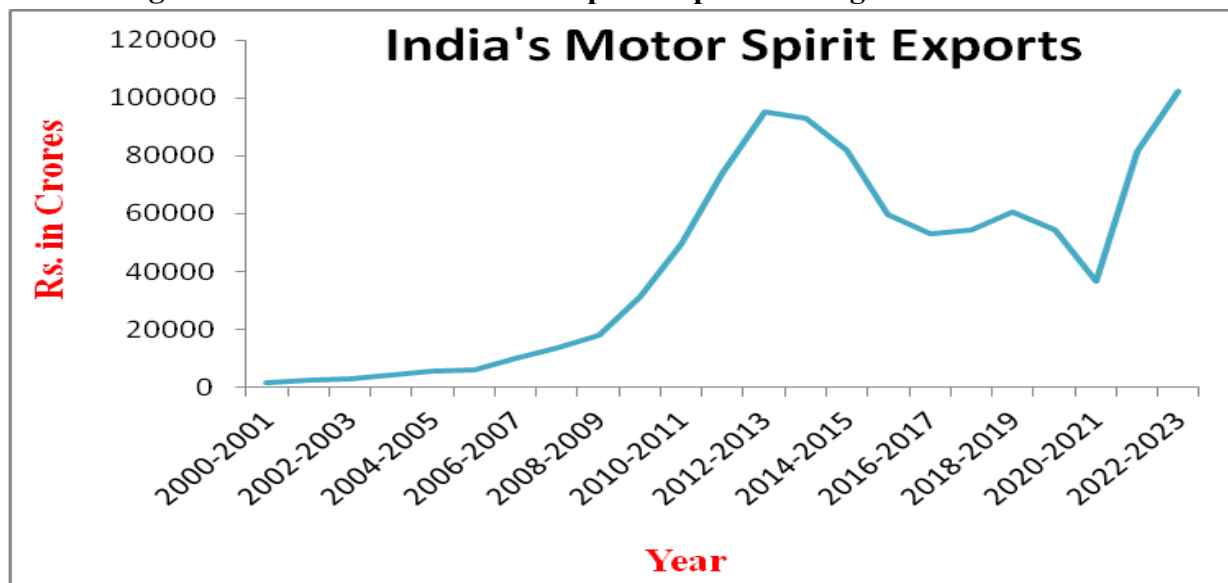
Table 1 India’s Motor Spirit Exports during 2000-01 to 2022-23

Year	Motor Spirit Exports	Growth Rate	Index	Share in Total Petroleum Exports
2000-2001	1442	-	-	18.80
2001-2002	2570	78.22	178.22	31.02
2002-2003	3011	17.16	117.16	27.71
2003-2004	4021	33.54	133.54	23.96
2004-2005	5625	39.89	139.89	18.80
2005-2006	5843	3.88	103.88	11.69
2006-2007	10191	74.41	174.41	12.57
2007-2008	13614	33.59	133.59	12.29
2008-2009	17810	30.82	130.82	14.54
2009-2010	31203	75.20	175.20	21.57
2010-2011	49480	58.57	158.57	25.13
2011-2012	73982	49.52	149.52	25.99
2012-2013	95346	28.88	128.88	29.79
2013-2014	92977	-2.48	97.52	25.25
2014-2015	81971	-11.84	88.16	28.40
2015-2016	59575	-27.32	72.68	33.70
2016-2017	52920	-11.17	88.83	27.15
2017-2018	54580	3.14	103.14	24.22
2018-2019	60419	10.70	110.70	22.57
2019-2020	54512	-9.78	90.22	21.46
2020-2021	36530	-32.99	67.01	23.24
2021-2022	81649	123.51	223.51	24.61

2022-2023	102489	25.52	125.52	22.34
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Source: Ministry of Petroleum & Natural Gas, Government of India.

Figure 1 Trend of India’s Motor Spirit Exports during 2000-01 to 2022-23



The value of India’s motor spirit exports has risen from Rs. 1442 crores in 2000-01 to Rs. 2570 crores in 2001-02 due to rise in global oil prices as well as expansion in market share. After that, this value accelerated from Rs. 4021 crores in 2003–04 to Rs. 5625 crores in 2004–05, but its share in total petroleum exports has decreased from 23.96 per cent in 2003–04 to 18.80 per cent in 2004–05. The value of motor spirit exports has terrifically accelerated from Rs. 5843 crores in 2005–06 to Rs. 10191 crores in 2006–07, and its share has also accelerated from 11.69 per cent in 2005–06 to 12.57 per cent in 2006–07. The value of exports has tremendously accelerated from Rs. 17810 crores in 2008–09 to Rs. 31203 crores in 2009–10.

The value of motor spirit exports has slightly decreased from Rs. 95346 crores in 2012–13 to Rs. 92977 crores in 2013–14, similarly its share in total petroleum exports has also shrunken from 29.79 per cent to 25.25 per cent in the corresponding years. Then the value of motor spirit export has tremendously decelerated to Rs. 81971 crores in 2014-15 due to increased domestic demand. Home market became more attractive as the result of the deregulation of petroleum prices and weak global demand. After that, this value of exports decelerated from Rs. 59575 crores in 2015-16 to Rs. 52920 crores in 2016-17. Likewise, its share has decelerated from 33.70 per cent to 27.15 per cent during the corresponding years due to global oil prices.

The value of motor spirit export has enormously decelerated from Rs. 54512 crores in 2019-20 to Rs. 36530 crores in 2020-21. The global fall in demand for motor spirits due to COVID-19 induced, lockdowns and social distancing measures adopted has resulted in the overall fall in motor spirit exports, while its share has accelerated from 21.46 per cent to 23.24 per cent during the corresponding years. The value of motor spirit export has dramatically risen from Rs. 81649 crores in 2021-22 to Rs. 102489 crores in 2022-23 due to India’s petrol exports to Europe in September being at their highest in 2023 as lower supplies to the continent from West Asia and United States due to the autumn refinery

maintenance season amid strong European demand appeared to have created an arbitrage opportunity for India suppliers.

During the years 2013-14, 2014-15, 2015-16, 2016-17, 2019-20 and 2020-21, India’s motor spirit exports have registered a negative growth rate. In the year 2021-22, the annual growth rate of India’s motor spirit export has registered the highest level of 123.51 per cent and in the year 2017-18, India’s motor spirit export has recorded its lowest level of 3.14 per cent. The value of the index shows that the value of India’s motor spirit exports has increased more than 70 times in the year 2022-23 than that of in the year 2000-01.

The trend and growth rate of value of motor spirit exports in India during the years 2000–01 to 2022–23 are presented in Table 2.

Table 2 Trend and Growth Rates of India’s Motor Spirit Exports during 2000-01 to 2022-23

Variable	Linear Model					
	a	b	F	t	R ²	
Motor Spirit Exports	-4823.937	3995.328	35.363	5.947 **	0.627	
Variable	Semi-log Model					CGR
	a	b	F	t	R ²	
Motor Spirit Exports	7.992	0.174	68.388	8.270 **	0.765	0.190

Source: Authors own calculation.

It could be understood from Table 2 that the R² values of India’s motor spirit exports were found to be satisfactory, and the ‘t’ values were also found to be statistically significant at the one per cent level. On an average, the value of India’s motor spirit exports has accelerated by 3995.328 crores per year during the study period from 2000–01 to 2022–23. The annual average growth rate of India’s motor spirit exports has risen by 17.4 per cent per year. The compound growth rate of India’s motor spirit exports was 19 per cent per annum during the study period.

Cuddy Della Valle Instability Index of India’s motor spirit exports in during 2000-01 to 2022-23 are presented in Table 3.

Table 3 Cuddy Della Valle Index of India’s Motor Spirit Exports during 2000-01 to 2022-23

Variable	CV	Adjusted R ²	CDVI	Inference
Motor Spirit Exports	79.336	0.610	30.941	High Instability

Source: Authors own calculation.

It is clear from Table 3 that India’s motor spirit exports during the years 2000–01 to 2022–23 are showing a significant growth rate with high instability. They additionally stated the reasons for high instability might be inconsistent domestic production, consumption and global demand.

Conclusion

India's exports of motor spirits experienced a positive growth rate. The motor spirit export has demonstrated a high level of instability. After imposing restrictions a year ago, the government has extended restrictions on the export of motor spirits to ensure that refined fuel is available in the domestic market. Oil refiners are mandated by the government to sell at least 50 per cent of their annual volume of motor spirit exports to the domestic market. Private oil companies discouraged from importing Russian oil for export to other countries, including many EU countries, by the move. The curbs were first put in place after the Russia-Ukraine war that started on February 24, 2022, as the non-state refiners started taking advantage of cheap oil coming from Russia to garner maximum profit. The government earlier said that the prices of motor spirit have not been increased by public sector oil marketing companies (OMCs) since April 6, 2022, despite record-high international prices. If the government take steps to reduce the restriction on motor spirit exports, the motor spirit exports could be increased to a desired level. Moreover, by the result of increased motor spirit exports the more foreign exchange reserve could be accumulated.

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