



Financial Performance of Indian Fertilizer Industry - A Comparative Evaluation of Private, Public and Cooperative Sector Companies

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ABSTRACT: Fertilizer Industry plays a prominent role in the Indian Agriculture and the economy. Indian food production has soared from 175 MT in 2002 – 2003 to 296 MT in 2019 – 2020 (Casey, 2020). With only a marginal increase in arable lands, the record productions are made possible with operational efficiency at the farm level. The judicious application of fertilizers has proven to increase the crop productivity worldwide. Reasons like residual effects, reduced soil fertility, imbalanced use of fertilizers, increased demand for organic products, etc., remain unwavering challenges to the industry. However, it has also opened up opportunities for innovations and segments like bio-fertilizers has seen an increasing demand trend over recent years. The article aims to analyse the financial performance of the industry as a whole, an under-explored area of study. The analysis takes into account private, public companies and cooperatives for the period of 2016-2020. The five-year average shows that the industry is financially weak. Reasons may include Raw material shortages, volatility of global price index of raw materials, unstable market conditions or poor operational practises. This calls for policy reforms on the government side and better management practices on the companies' side.

Keywords: Financial performance, Fertilizer industry, Altman Z Score, Performance Analysis.

INTRODUCTION

The agrarian society in India contributes around 58 per cent of the workforce and shares around 15 per cent of the nation's GDP. It was the only light of optimism in India's Gross Domestic Product (GDP) for the first quarter of 2020-21 when all other sectors fell through amid the Covid19 crisis. It recorded a 5.7% growth in 2020-21 with the second advanced estimates for food grain production at record 291.95 million tonnes for 2019-20 (RBI, 2020). India's growth from self-sufficiency to record productions with limited cropping area, fluctuating rainfall, growing population etc., has been realisable due to factors like crop rotation, judicious use of fertilizers, mechanisation and innovation. Fertilizer Industry in India was estimated to be INR 6,258 Billion in 2019 and is estimated to grow at a moderate pace till 2025 (imarc Group, 2020). Fertilizers have been a catalyst in intensifying and increasing the food production during the green revolution in the 1960s. Today, it is the second largest consumer and third largest producer of fertilizers in the world. The government of India has propagated many schemes and subsidies that promote and favour increased production and productivity of fertilizers in

the country. The self-reliant India scheme which aims at reducing the imports of fertilizers is noteworthy. The journey of the Fertilizer industry began with its first factory at Ranipet, Tamil Nadu in 1906. Over the years, the fertilizers produced and technologies employed had improved and have led to novel and state of art production facilities that stand today. The fertilizer industry in India is under the purview of the Department of Fertilisers, Ministry of Chemicals & Fertilizers. Its main aim is to ensure the timely availability of fertilizers at a reasonable price for sustained food production. The use of fertilizers has increased food production and productivity in India. With regard to regions, the Northern part of India tops the consumption of fertilizers. The growing population demands increased food production all over the world. Consumer awareness and preferences for organic food produce has opened up many opportunities for bio-fertilizer plants in India. This calls for innovative alternatives for chemical-based fertilizers like Neem coated urea. The incumbents in the industry should be constantly evolving and keeping pace with novel startups. The fertilizer sector involves public sector units, private enterprises and cooperatives in the production of fertilizers. India produces nitrogen and

phosphatic based fertilizers but relies entirely on imports for potassic fertilizers. Performance analysis using Altman Z score is done to understand the industry better. The significance and contribution of the fertilizer sector to the Indian economy is conspicuous. On that account, an attempt has been made to analyse the performance of the fertilizer industry in India using the Altman Z Score Model.

REVIEW OF LITERATURE

A few studies that used Altman Model for financial analysis has been reviewed.

Altman model is a good analysis tool for performance analysis of fertilizer sector (Saini, 2018). He has used the Altman Z score to analyse the performance of Tata Chemicals. The results were that Tata Chemicals belonged to the grey zone. The model was also used in the financial analysis of dairy cooperatives in Gujarat. The results were that the cooperatives belonged to the safe zone (Patel, 2018). Altman model was used to predict bankruptcy in the companies listed in the Indonesia Stock Exchange (Khaddafi *et al.*, 2017). Corporate bankruptcy in the Pakistan Banking sector has been analysed using the Z approach (Ilahi *et al.*, 2015). Altman model was used to study the effects of multiple loans on SMEs. Additional models to weigh the accuracy of the model have also been used (Lubawa and Louangrath 2016) Performance of select Indian public sector banks were assessed using the Altman Z Score model (Joshi, 2020). He concluded

that the banks fell under the safe zone and that an increase in net profits would increase the z score value. It can be concluded from the past literatures that Altman Model was primarily focused on assessing the bankruptcy of companies especially in the banking sector. A few studies use it as a performance analysis tool. In the same lines, the current study has attempted to use it as a performance analysis tool in the fertilizer industry.

METHODOLOGY

Sample Selection

The companies selected for the study include private companies listed in the Bombay Stock Exchange (BSE) and National Stock Exchange (NSE), public listed companies listed by the Department of Fertilizers, Government of India and fertilizer cooperatives. A total of 16 private companies were selected based on the data available and market capitalisation. Six public sector companies and two fertilizer cooperatives were also included. The companies are listed in Table 1.

The research entails analysing the performance of public sector units, private companies and cooperatives in the fertilizer sector. Quantitative data collected from annual reports, company websites and Prowess database were used for the empirical analysis. Altman Z score Analysis for the select companies was done for the time period 2016-2020.

Table 1: Fertilizer Companies Selected for Study.

S.No.	Name of the Company	Identifier
1.	Basant Agro Tech (India) Ltd.	A1
2.	Bharat Agri Fert & Realty Ltd.	A2
3.	Chambal Fertilisers and Chemicals Ltd.	A3
4.	Coromandel International Ltd.	A4
5.	Deepak Fertilizers and Petrochemicals Coprn Ltd.	A5
6.	Gujarat Narmada Valley Fertilizers & Chemicals Ltd.	A6
7.	Gujarat State Fertilizers & Chemicals Ltd.	A7
8.	Indra Industries Ltd.	A8
9.	Khaitan Chemicals and Fertilizers Ltd.	A9
10.	Mangalore Chemicals and Fertilisers Ltd.	A10
11.	Nagarjuna Fertilisers and Chemicals Ltd.	A11
12.	The Phosphate Company Ltd.	A12
13.	Rama Phosphates Ltd.	A13
14.	Shiva Global Agro Industries Ltd.	A14
15.	Southern Petrochemical Industries Corporation Ltd.	A15
16.	Zuari Agro Chemicals Ltd.	A16
17.	Brahmaputra Valley Fertilizer Corporation Ltd.	B1
18.	Fertilisers and Chemicals Travancore Ltd.	B2
19.	FCI Aravali Gypsum and Minerals India Limited(FAGMIL)	B3
20.	Fertilizer Corporation of India Limited	B4
21.	Madras Fertilizers Limited	B5
22.	National Fertilizers Limited	B6
23.	Rashtriya Chemicals & Fertilizers Ltd.	B7
24.	Indian Farmers Fertiliser Cooperative Ltd.	C1
25.	Krishak Bharati Cooperative Ltd.	C2

Application of Altman Z Score Model

The Altman model was first postulated by an American Professor, Edward I. Altman as a measure of financial stability of companies in the year 1968 (Altman, 2013). This model includes 5 basic financial ratios viz., liquidity, profitability, leverage, solvency, and activity ratio to study whether the company is likely to go bankrupt in the next two years.

After various experiments, Altman used the above ratios, assigned weights and arrived at the following formula,

$$Z = 0.012A + 0.014B + 0.033C + 0.006D + 0.999E$$

A more commonly used variation of the formula is given below.

$$Z = 1.2A + 1.4B + 3.3C + 0.6D + 1.0E$$

Where,

- $A = \text{Working Capital} / \text{Total Assets}$
- $B = \text{Retained Earnings} / \text{Total Assets}$
- $C = \text{EBIT} / \text{Total Assets}$
- $D = \text{Market value of equity} / \text{Total Liabilities}$
- $E = \text{Sales} / \text{Total Assets}$
- $Z = \text{Overall index}$

The Z Score model has been proved to have 72-80% reliability than the previous methods used for financial stability analysis. On a general note, a lower Z score indicates a higher risk of bankruptcy and vice versa. The description of the model is given below:

A = Working Capital / Total Assets

Working Capital is the measure of current assets minus current liabilities. It is used to determine the short-term financial health of a company. A positive ratio indicates that the company can meet its short-term obligations and a negative value means it will struggle to meet the current needs.

B = Retained Earnings / Total Assets

It indicates the amount of losses or retained earnings in the company. A higher ratio means it uses its retained earnings to fund its expenditure and vice versa.

C = EBIT / Total Assets

Earnings Before Interest and Tax Ratio is a measure of profitability of a company. It indicates whether the company is able to generate enough revenues from its operations to meet the current needs of the company.

D = Market value of equity / Total Liabilities

This ratio specifies the degree to which a company's market value will decline once it declares bankruptcy. The higher the ratio, the higher the investor will have confidence in investing in the stocks of the company.

E = Sales / Total Assets

This ratio shows the efficiency of the company in generating revenues through proper asset utilisation. A higher ratio is favourable.

The details of interpretation of results based on the Z score analysis is given below.

Z-Score Analysis	
Z-Score	Forecast Interpretation
Above 3.0	Bankruptcy is not likely - Safe Zone
1.8 to 3.0	Bankruptcy can not be predicted - Grey Zone
Below 1.8	Bankruptcy is likely - Distress Zone

RESULTS AND DISCUSSION

The results of the z score analysis for the fertilizer industry by ownership pattern is given in Table 2.

Table 2: Estimated Altman Z Score for Sample Fertilizer Companies (2016-20).

Companies	Z Score for Private Sector Companies						Average	Interpretation
	2016	2017	2018	2019	2020			
A1	0.782	0.786	0.998	1.854	2.016	1.287	Distress	
A2	2.191	1.643	1.796	1.320	1.247	1.639	Distress	
A3	1.926	1.809	1.950	1.226	1.618	1.705	Distress	
A4	2.101	1.681	1.807	1.974	2.308	1.974	Grey	
A5	1.895	1.064	1.005	0.859	1.325	1.229	Distress	
A6	0.946	1.056	1.321	1.742	1.377	1.288	Distress	
A7	2.440	2.191	2.081	1.359	1.136	1.8414	Grey	
A8	1.29	0.977	0.813	(1.377)	(0.343)	0.272	Distress	
A9	1.445	1.736	1.518	1.844	1.791	1.666	Distress	
A10	1.552	1.401	1.400	1.442	1.400	1.439	Distress	
A11	0.771	1.052	1.042	(0.612)	(0.874)	0.275	Distress	
A12	0.878	0.823	0.882	1.235	3.834	1.530	Distress	
A13	2.159	2.403	2.324	3.180	2.470	2.507	Grey	
A14	1.747	1.706	1.715	2.007	1.814	1.7978	Distress	
A15	1.589	1.250	1.899	1.340	0.993	1.4142	Distress	
A16	(0.234)	(0.003)	(0.562)	0.660	0.298	0.0318	Distress	
Average							1.368	Distress
Public Sector Companies								
B1	1.337	1.096	1.034	0.926	0.926	1.0638	Distress	
B2	-0.921	-1.158	-0.757	2.844	3.368	3.106	Safe	
B3	1.734	1.808	0.104	0.178	0.178	0.800	Distress	
B4	1.080	1.366	1.853	1.573	1.5	1.4744	Distress	
B5	0.357	-0.563	-0.089	(0.269)	(0.560)	-0.414	Distress	
B6	0.771	1.083	1.176	1.288	1.066	1.176	Distress	
B7	2.450	1.286	1.472	1.373	1.266	1.319	Distress	
Average							1.218	Distress
Cooperatives								
C1	0.925	0.904	0.683	0.672	0.724	0.781	Distress	
C2	0.738	0.625	0.650	0.645	0.463	0.624	Distress	
Average							0.702	Distress
Overall Industry Average							1.273	Distress

From the results obtained, it is clear that the industry as a whole fall under the Distress zone i.e., the financial stability of the industry is unstable. Private and Public sector companies are comparatively in a more stable position than the Co-operatives. On an individual note, the best performing company was B2 (Fertilisers and Chemicals Travancore Ltd.) and B5 (Madras Fertilizers Limited) was the poorest performing company on the five-year average period. Companies falling under the distress zone should take immediate actions to stabilise their financial operations. Companies under the grey zone have a moderate likelihood of going bankrupt in the next two years. It is suggested that these companies take notice of their liabilities and focus on improving operational performance. Companies under the safe zone are performing well and should have their spotlights on

operations and activities that continue to contribute to the increased performance.

Given below in Table 3 is the analysis of performance of companies by age. Out of the 10 companies established before 1970, 7 companies fall under distress zone, 2 under grey and 1 under safe zone. There are 6 companies that began operation in the 1970s all of which fall under the distress zone. Out of the five companies that were founded in 1980s, four companies fall under distress and one under grey zone. Out of the two companies in the 1990s, and two companies in 2000s, all of them fall under the distress zone. From the average scores of each decade it is clear that all companies are in the distress zone. This calls for better policy reforms and management practices that help in managing their liabilities efficiently.

Table 3: Estimation of Altman Z Score for Fertilizer Industry by Age (2016-2020).

Companies	Year Founded	Z Score						Average	Result
		2016	2017	2018	2019	2020			
B2	1943	-0.921	-1.158	-0.757	2.844	3.368	3.106	Safe	
A12	1950	0.878	0.823	0.882	1.235	3.834	1.530	Distress	
B4	1961	1.080	1.366	1.853	1.573	1.5	1.4744	Distress	
A4	1961	2.101	1.681	1.807	1.974	2.308	1.974	Grey	
A7	1962	2.440	2.191	2.081	1.359	1.136	1.8414	Grey	
A2	1962	2.191	1.643	1.796	1.320	1.247	1.639	Distress	
B5	1966	0.357	-0.563	-0.089	(0.269)	(0.560)	-0.414	Distress	
A16	1967	(0.234)	(0.003)	(0.562)	0.660	0.298	0.0318	Distress	
C1	1967	0.925	0.904	0.683	0.672	0.724	0.781	Distress	
A15	1969	1.589	1.250	1.899	1.340	0.993	1.4142	Distress	
Average							1.337	Distress	
A10	1974	1.552	1.401	1.400	1.442	1.400	1.439	Distress	
A11	1974	0.771	1.052	1.042	(0.612)	(0.874)	0.275	Distress	
A6	1976	0.946	1.056	1.321	1.742	1.377	1.288	Distress	
B7	1978	2.450	1.286	1.472	1.373	1.266	1.319	Distress	
A5	1979	1.895	1.064	1.005	0.859	1.325	1.229	Distress	
B6	1979	0.771	1.083	1.176	1.288	1.066	1.176	Distress	
Average							1.121	Distress	
C2	1980	0.738	0.625	0.650	0.645	0.463	0.624	Distress	
A9	1982	1.445	1.736	1.518	1.844	1.791	1.666	Distress	
A13	1984	2.159	2.403	2.324	3.180	2.470	2.507	Grey	
A8	1984	1.29	0.977	0.813	(1.377)	(0.343)	0.272	Distress	
A3	1985	1.926	1.809	1.950	1.226	1.618	1.705	Distress	
Average							1.353	Distress	
A1	1990	0.782	0.786	0.998	1.854	2.016	1.287	Distress	
A14	1993	1.747	1.706	1.715	2.007	1.814	1.7978	Distress	
Average							1.542	Distress	
B1	2002	1.337	1.096	1.034	0.926	0.926	1.0638	Distress	
B3	2003	1.734	1.808	0.104	0.178	0.178	0.800	Distress	
Average							0.931	Distress	
Overall Industry Average							1.273	Distress	

CONCLUSION

According to the findings of the study, the fertilizer industry as a whole is in financially distress state. Going by the ownership pattern, private companies exercised better financial operations comparatively. The study also found that the companies found during the 1960s performed better financially compared to that were the companies established during later periods. Madras Fertilizers Limited fared poorly and the best performing company was Fertilizers and Chemicals Travancore Ltd. Altman Model is a simple yet profound model to understand the financial

performance of the companies. The fertilizer industry is predicted to have a CAGR of 11.9% during 2020-2025. Growing population, increased demand, changing customer preferences etc acted as a stimulus to boost fertilizer production in India. Environmental and residual effects of chemical fertilizers have been realized and a shift has been seen from chemical based fertilizers to organic bio based fertilizers. This opens up new arenas for innovation and development in the fertilizer sector in the near future.

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