

Factor Analysis of Financial Performance of Selected Indian Agro-Based Manufacturing Companies

YUKTIBALJIT CHANDOK*

Abstract

The application of factor analysis in financial analysis is a technique to reduce complexities of a large number of selected ratios into lesser and concise subsets. This technique helps in saving considerable time and efforts of the financial analysts. Our study applies Factor Analysis to 23 specific financial ratios of 12 selected companies from agro-based manufacturing sector of India. The agro-based manufacturing sector was chosen for the study as growth of this sector means integrated development of agricultural and industrial areas. Audited financial data of four companies each from top three Indian agro-based manufacturing industries, namely Textile, Paper and Sugar for a 10 year period from 2008-09 to 2017-18, was used for factor analysis. The purpose of the study is to group the financial ratios into categories and eliminate redundancy among them. This study supports the inference that factor analysis is a useful tool to test the traditional structure and grouping of ratios.

JEL Code : M490;G390

Keywords : Ratio Analysis; Factor Analysis; Agro-based Manufacturing; Companies; Textile; Paper ; Sugar; Financial Ratios; India

I. Introduction

"FINANCIAL PERFORMANCE" IS a comprehensive evaluation of a company's overall standing in categories such as assets, liabilities, equity, expenses, revenue and profitability. The term is also used as a general measure of a firm's overall financial health over a given period. Analysts and investors use financial performance to compare similar firms across the same industry or to compare industries or sectors in aggregate; over a period of time. Ratio analysis is an important technique of financial performance analysis. A ratio is a comparison of one figure or combination of figures with another figure or combination of figures in order to understand and interpret a company's financial position. These figures are derived from the published financial statements of a given company. Use of financial ratios is multi-

* Director, Gujarat University, SOM-Lalit Institute of Business Administration, SLIMS Campus, Opp. Xaviers College, Navrangpura, Ahmedabad, Gujarat 380009, INDIA.

companies can be covered in the ambit of study. Comparative factor analysis for ratios of Indian and International companies can provide insights into the differences of factor definition for companies of different geographical scopes.

This study can provide a proper direction and save resources for researchers in the future. The use of Factor Analysis in accounting research is gaining grounds. Clarity of assumptions, justifications and disclosures regarding their use should improve the application of Factor Analysis in accounting research.

References

Ali, H. and A. Charbaji, (1994), "Applying factor analysis to financial ratios of international commercial airlines", *International Journal of Commerce and Management*, Vol. 4, No. 1-2, pp.25- 37

Arora, M.N., (2016), "*Cost and Management Accounting*", 3rd edition, Himalaya publishing house, Delhi, pp. 1-700

Bai, A.; S. Hira, and P. Deshpande, (2015), "An Application of Factor Analysis in the Evaluation of Country Economic Rank", *Procedia Computer Science*, Vol. 54, pp. 311-317

Chandok, Y., (2022), "*A Study of Financial Statements of Selected Companies from Agro-based Manufacturing Sector in India*", Doctoral Research Thesis, Gujarat University, Gujarat, India, pp. 1-379

Chellasamy, P. and N. Ponsabariraj, (2018), "Performance of select Oil and Petroleum Companies in India with respect to Profitability and Liquidity Analysis", *Finance India*, Vol. XXXII, No. 1, 139-156

Chong, K.; B. Yap and Z. Mohamad, (2013), "A Study on the Application of Factor Analysis and the Distributional Properties of Financial Ratios of Malaysian Companies". *International Journal of Academic Research in Management (IJARM)*, Vol. 2, No. 4, pp. 83-95

Damani, A.; D. Nadar; N. Navalkha and P. Nair, (2021), "An Empirical study of the Financial Ratios of the Indian Information Technology Sector by applying Factor Analysis and Substantiation of the results using Cluster Analysis", *Finance India*, Vol. XXXV, No. 1, pp. 135-150

De, A.; G. Bandyopadhyay and B. Chakraborty, (2011), "Application of Factor Analysis on the Financial Ratios and Validation of the Results by Cluster Analysis: An Empirical Study on the Indian Cement Industry", *Journal of Business Studies Quarterly*, Vol. 2, No. 3, pp.13-31

Demirhan, H. and A. Waseem, (2014), "Factors Affecting the Financial Performance of the Firms during the Financial Crisis: Evidence from Turkey", *Strategic Research Journal*, Vol. 5, No. 10, pp.65-80

Erdogan, A., (2012), "Applying Factor Analysis on the Financial Ratios of Turkey's Top 500 Industrial Enterprises", *International Journal of Business and Management*, Vol. 8, No. 9, pp.134-139

Ghosh, A; B. Agarwal; G. Bandyopadhyay and K. Choudhuri, (2014), "Indian Automobile Companies' Financial Efficiency Measurement: An investigation using Super Efficiency and Factor Analysis", *Global Business Review*, No. 15, No. 1, pp.121-145

Gowda, J., (2009), "Accounting for Managers", 2nd edition, Himalaya Publishing house, Delhi, pp. 1-833

Henson, R.K. and J.K. Roberts, (2006), "Use of exploratory factor analysis in published research: Common errors and some comment on improved practice", *Educational and Psychological Measurement*, Vol. 66, No. 3, pp.393-416

Méndez-Natera, J.; A. Rondón; J. Hernández and J. Merazo-Pinto, (2012), "Genetic Studies in Upland Cotton. III. Genetic Parameters, Correlation and Path Analysis", *SABRAO Journal of Breeding and Genetics*, Vol. 44, pp.112-128

Mulaik, S. A., (2009), "Foundations of factor analysis", 2nd edition, Chapman & Hall, London, UK, pp.1-548

Ocal, M.; E. Oral; E. Erdis and G. Vural, (2007), "Industry Financial Ratios-Application of Factor Analysis in Turkish Construction Industry", *Building and Environment*, Vol. 42, No. 1, pp.385-392

Pal, S., (2017), "Behavior of Financial Ratios of Indian Steel Industry during Post Recession Period", *IOSR Journal of Business and Management (IOSR-JBM)*, Vol. 20, No. 1, pp.39-43

Patki, A., (2021), "Analysis of Inventory Turnover Ratio and its Impact on Profitability Ratios of Enterprises in Indian Retail Industry", *Finance India*, Vol. XXXV, No. 2, pp.451-466

Pinches, G.; K. Mingo and J. Caruthers, (1973), "The stability of financial patterns in industrial organizations", *The Journal of Finance*, Vol. 28, No. 3, pp.389-396

Sarstedt, M. and E. Mooi, (2019), "Principal Component and Factor Analysis. In: *A Concise Guide to Market Research*", Chapter 8, 3rd Edition, Springer, Berlin, Germany, pp. 257-299

Souza, J.; D. Mendonca; G. Benedicto and F. Carvalho, (2017), "Application of factor analysis to identify the economic and financial key performance indicators in banking institutions", *Revista Catarinense da Ciência Contábil*, Vol. 16, No. 47, pp.25-39

Tan, P.; H. Koh and L. Low, (1997), "Stability of Financial Ratios: A study of listed companies in Singapore", *Asian Review of Accounting*, Vol. 5, No. 1, pp.19-39

**Annexure
Table A1**

Four companies selected on the basis of net sales/turnover in the Indian Textile, Paper and Sugar Industries

No.	Industry	Selected Listed companies	Establishment year	Sales/Turnover as on 31-3-2018 (? in ten lakhs)
1.	Textile	1. Arvind Ltd.	1931	64,204.20
		2. Bombay Dyeing & Manufacturing Company Ltd.	1879	26,623.20
		3. Grasim Industries Ltd.	1947	1,57,884.70
		4. Vardhman Textiles Ltd.	1973	58,513.70
2.	Paper	1. International Paper APPM Ltd	1964	12,640.00
		2. Satia Industries Ltd.	1980	6342.20
		3. Seshasayee Paper & Boards Ltd.	1960	11,046.50
		4. West Coast Paper Mills Ltd	1955	17,102.00
3.	Sugar	1. Balrampur Chini Mills Ltd.	1975	43,425.40
		2. Bannari Amman Sugars Ltd.	1983	14,807.50
		3. DCM Shriram Industries Ltd.	1989	17,044.30
		4. EID Parry (India) Ltd.	1975	19,212.90

Source: Self Constructed using Annual Reports of Companies

**Table A2
List of Ratios Used for the Study**

No.	Category	Ratio	Abbreviation
A.	Liquidity Ratios	1. Current ratio	CARATIO
		2. Liquid ratio	LIQRATIO
		3. Cash and bank to current liability ratio	CASHTOCL
B.	Profitability Ratios	1. Gross profit ratio	GPRATIO
		2. Expense ratio	EXPRATIO
		3. Net profit ratio	NPRATIO
		4. Return on total assets	ROTARATIO
		5. Return on capital employed	ROCERATIO
		6. Return on net worth/shareholder's fund	RONRATIO
		7. Return on equity share capital	ROESCRATIO
		8. Earnings per share	EPS
C.	Efficiency Ratios	1. Average inventory turnover ratio	INVENTORYRATIO
		2. Fixed assets turnover ratio	FAASSETSTORATIO
		3. Working capital turnover ratio	WCTORATIO
		4. Total assets turnover ratio	TOTALASSETSTOR
		5. Investments turnover ratio	INVESTMENTTOR
		6. Capital employed turnover ratio	CETORATIO
		7. Capital turnover ratio	CAPITALTURNOVER
		8. Debtors velocity ratio	DEBTORSVELOCITY
		9. Creditors velocity ratio	CREDITORSVELOCITY
D.	Solvency Ratios	1. Debt equity ratio	DEBTEQUITY
		2. Proprietary ratio	PROPRATIO
		3. Interest coverage ratio	INTCOVERAGE

Source: Self Constructed

**Table A3
Table of Component Transformation Matrix**

Component	1	2	3	4	5	6	7
1	0.924	-0.127	0.002	-0.272	0.046	0.226	0.053
2	-0.011	0.712	-0.579	-0.293	0.259	0.026	0.067
3	0.200	0.658	0.418	0.358	-0.468	0.075	0.001
4	0.018	0.204	0.614	-0.120	0.711	-0.245	-0.031
5	0.294	-0.041	-0.333	0.766	0.300	-0.343	-0.082
6	0.019	-0.036	0.022	-0.008	-0.077	-0.313	0.946
7	-0.138	-0.018	0.032	0.334	0.332	0.817	0.301

Notes : Extraction Method: Principal Component Analysis

Source: Self-constructed, based on data analysis