

AN ANALYSIS OF GROWTH OF PAPER INDUSTRY IN INDIA

CA (Dr.) Yukti Chandok*

ABSTRACT

One of the most prominent and progressive industrial sectors in India, which promotes an all-inclusive growth of both agriculture and industry, is the Agro-based sector. Indian Paper Industry is one of the most significant agro-based manufacturing industries in India. It is a vast industry comprising of more than 157 paper producing divisions all over the country. It accounts for about 1.6 percent of the world's production of paper. The Great Recession of 2007-2009 impacted the Paper Industry greatly. This study is an attempt to analyse and compare the growth situation of Paper Industry in India during the pre and post-recession period; given the significant impact that the global crisis has had on the Indian Paper Industry. A period of 24 years from 1993-94 to 2016-17 is used for analysis – this period is divided into pre-recession period ranging from 1993-94 to 2007-08 and post-recession period ranging from 2008-09 to 2016-17. Simple and compounded annual growth rates have been calculated for five selected growth parameters namely: number of factories, number of employees, productive capital, profits and net-value added Using t-test, it was primarily concluded that there is significant difference in growth of Paper Industry in India during the pre-recession and post-recession period.

Keywords: *Agro-Based Sector, Simple and Compound Growth Rate, Pre and Post-Recession.*

Introduction

Industries that depend on agricultural products as primary raw-material are agro-based industries. These industries play a significant role in promoting integrated development of agricultural and industrial sectors; by strengthening industrial and agricultural linkages. This sector consists of a host of industries such as wood and wood products, sugar, textile, paper, rubber etc. Indian Paper Industry which is a prominent industry of Agro-sector has a vital role to play in socio-economic development of a country. Indian Paper Industry is a vast industry which is century old and comprises of more than 157 paper producing divisions all over the country. It accounts for about 1.6 percent of the world's production of paper. Growth of the industry in GDP is on an average 6-7 percent over the last few years. India is the fastest growing market for paper globally and it presents an exciting future scenario. (www.indiamirror.com)

Several micro and macro financial, political, legal, social, economic and other factors impact the growth of any sector/industry. The phase of business cycle which an economy passes through is a highly significant criterion for analysing growth. The entire world economy passed through a sub-par phase

* Assistant Professor, Faculty of Business Administration, GLS University, GLS Campus, Opp. Law Garden, Ellisbridge, Ahmedabad, Gujarat, India.

during 'The Great Recession' from 2007-2009. This recession originated with the fall in subprime mortgage market in the United States (U.S). A combination of several risks that developed in the financial system, along with a series of events that started with the downfall of the U.S. housing scene, led to this situation. This recession technically dates from December 2007 to June 2009 since a conglomerate of banks were unable to provide finance to businesses and home-loan borrowers repaying debts instead of seeking new loans and spending. All global economies suffered from a cascading effect, due to this situation. China, Japan, Hong Kong, India and other Asian markets were soon affected and vulnerized by this crisis in the U.S. The situation in India was still moderate with a decline in GDP from 9% to 7.8% comparing 2007-08 and the first and second quarter of 2008 respectively. But this picture did not last long. The Wall Street crashed in September 2008 and this led to a sky fall in the growth numbers at 5.8%, 5.8% and 6.1% respectively for the subsequent three financial quarters (economicstimes.indiatimes.com, article by Swaminathan SA Aiyar).

In India, this ripple down effect of recession took a toll on Paper Industry. It was one of the worst hit sectors which played a key role in the nation's economy in terms of contribution to industrial production, GDP and export earnings. It would be interesting and significant to analyse the impact of the great recession on the growth parameters of the Indian Paper Industry. Therefore, this study makes an attempt to compare and analyse the growth of Paper Industry in India during pre and post-recession period (Chandok and Patel, 2021).

This research paper includes the following sections presented next. To begin with, literature review of past work done in this field is discussed. It is followed by objectives, proposed hypothesis, research methodology, an analysis of growth of Paper Industry in India during pre and post-recession period, results from hypothesis testing, and finally the conclusion.

Review of Literature

A literature review is an evaluative report of information found in the literature related to selected area of study. Table 1 depicts prior studies in this field.

Table 1: Review of Literature

Authors & year of Publication	Period of Study	Scope of Study	Parameters of Study	Major Findings & Recommendations (if any)
Kaur & Kiran (2008)	Pre-reform period from 1980-81 to 1990-91 & post-reform period from 1991-92 to 2002-03	Growth & productivity of Indian manufacturing sector under new policy regime	Capital productivity, labour productivity and total factor productivity	In post-reform period, productivity of Indian manufacturing sector has gone down. Study suggested efficient use of labour, capital and creating productivity suitable environment for the development of Indian manufacturing sector.
Das (2010)	Pre and post downturn regime	Examine the correlation interactive picture between global recession and Indian textile industry and its impact on HR (Human Resources) practices in India	Trade exports and HR practices explored by Indian textile firms	Global economic slowdown related to shrinkage of output, decreasing investments, retrenchments & layoffs and finally adversely affecting the profitability of the Indian textile industry.
Gopalakrishnan, Anandhakumar, Santhoshkumar and Divya (2010)	Immediate post-recession period	Impact of global economic challenge on Indian textile industry	Employment and Indian textile exports	Recession of 2008 had slowed down Indian textile sector, resulting in production cuts and shut down of loss making units, causing a decline of 0.92 % in overall employment between October-December 2008 and India's textile exports had declined by 5.31% during April-February 2008-09 compared to the corresponding period of the previous financial year. They recommended Indian textile industry can grow provided it introduces innovation and with government's introduction of relief packages.
Ray (2011)	Over the period 2000-01 to 2008-09	Analysed the financial performance of 133 Indian paper and paper product companies in India in Post-Liberalization period	Financial performance in the light of liquidity, solvency and profitability	The study concluded sound liquidity and profitability position of the industry, current asset efficiency, operational efficiency, lower dividend payment, etc. Study suggested to curtail dependency on equity funds, improve dividend payout and to maximise assets and minimise liabilities to improve overall financial position.
Madhavi (2014)	For the period 1 st April 2002 to 31 st March 2011	Studied working capital management of two paper mills	Evaluate current financial position in terms of profitability, liquidity, efficiency and solvency	The study concluded idle cash and bank balance and unsatisfactory cash ratio. Study suggested effective utilization of cash and bank balance in attractive investments or to pay back its short term liabilities.
Megaladevi (2015)	Period of study was 10 years from 2004-05 to 2013-14	Analysed the financial performance of select paper company with special reference to Tamil Nadu Newsprint and papers limited (TNPL) in order to highlight its strengths and weaknesses	Liquidity and Solvency	Study concluded that liquidity position was very poor reflecting the inability of company to pay short-term obligations. Moreover financial stability showed a downward trend and more reliance on external long term borrowings. The study would be useful to investors to identify the nature of paper industry and take investment decision.

Objectives of the Study

Following are the main objectives of this research:

- To study the growth of Paper Industry in India during pre and post-recession period.
- To compare the growth of Paper Industry in India during pre and post-recession period.
- To give suggestions for the growth of Paper Industry in India.

Proposed Hypothesis of the Study

Based on the data of selected growth parameters for Paper Industry in India during pre and post-recession period, the research proposes following hypothesis.

There is no significant difference in the growth of Paper Industry in India between the pre-recession and post-recession period.

Research Methodology

For the purpose of this study the parameters used for studying growth, time period and tools used for analysis are discussed as follows.

- **Study Parameters**

For the current research, growth of Paper Industry is analysed on the basis of five parameters - number of factories, employment, productive capital, profits and net-value added. These five parameters constitute the most significant ones for studying growth trends in any manufacturing sector.

- **Study Period**

The period of study is 24 years from 1993-94 to 2016-17; which is bifurcated into two: pre-recession period ranging from 1993-94 to 2007-08 and post-recession period ranging from 2008-09 to 2016-17.

- **Tools Used for Analysis**

Simple growth rates and compound annual growth rates have been calculated for various parameters considered for growth. These parameters have been selected as they are the key indicators of growth of Paper Industry in India. For this research study, t test was applied using SPSS (version 24) to test the hypothesis.

Simple growth rates, average annual growth rates and compound annual growth rates at national level have been calculated for various parameters; considered for the growth.

They are calculated as follows:

- **Simple Growth Rate** = $\frac{\text{Amount of current year} - \text{Amount of previous year}}{\text{Amount of previous year}} \times 100$

- **Average Annual Growth Rate(AAGR)** = $(\text{Growth Rate in Period A} + \text{Growth Rate in Period B} + \text{Growth Rate in Period C} + [\text{Other Periods}]) / \text{Number of Periods}$

- **Compound Annual Growth Rate(CAGR)** = $(\text{End Value}/\text{Start Value})^{(1/\text{Years})} - 1$

Compound Annual Growth Rates (CAGR) was used to analyse the growth of various selected parameters. This is because CAGR is a better measure given the large Range and high Standard Deviation of the data. (Chandok and Patel, 2021)

Growth of Paper Industry in India during Pre and Post-Recession Period

Table 2 depicts the growth in number of factories, employment, productive capital, profits and net value added for the Paper Industry in India from 1993-94 to 2007-08 and **Table 3** depicts the growth in number of factories, employment, productive capital, profits and net value added for the Paper Industry in India from 2008-09 to 2016-17.

**Table 2: Growth of Paper Industry in India during Pre-Recession Period:
Data from 1993-94 to 2007-08**

Annual Survey : Manufacture of Paper and Paper Products in India: Data from 1993-94 to 2007-08										
Year	Number of factories		Total employees		Productive capital		Profits		Net value added	
	Numbers	Growth Rate(%)	Numbers	Growth Rate(%)	Rs. million	Growth Rate(%)	Rs. million	Growth Rate(%)	Rs. million	Growth Rate(%)
1993-94	2,602		1,55,201		50,924.40		2,569.90		13,195.70	
1994-95	2,504	-3.77	1,61,417	4.01	1,04,422.40	105.05	5,006.40	94.81	18,389.80	39.36
1995-96	2,789	11.38	1,75,172	8.52	91,805.00	-12.08	-5,184.70	-203.56	26,375.70	43.43
1996-97	2,865	2.72	1,78,579	1.94	1,17,524.80	28.02	4,011.20	177.37	22,588.50	-14.36
1997-98	2,945	2.79	1,84,144	3.12	1,00,837.00	-14.20	-1,588.00	-139.59	17,941.80	-20.57
1998-99	3,252	10.42	1,65,245	-10.26	1,16,632.40	15.66	-2,680.60	-68.80	17,865.90	-0.42
1999-00	3,325	2.24	1,75,765	6.37	1,47,201.70	26.21	-6,723.70	-150.83	20,330.80	13.80
2000-01	3,425	3.01	1,79,706	2.24	1,35,160.40	-8.18	10,916.20	262.35	37,480.60	84.35
2001-02	3,378	-1.37	1,68,336	-6.33	1,33,125.60	-1.51	1,707.50	-84.36	27,555.40	-26.48
2002-03	3,476	2.90	1,74,051	3.39	1,63,079.00	22.50	5,332.70	212.31	33,265.70	20.72
2003-04	3,578	2.93	1,74,892	0.48	1,43,635.00	-11.92	8,156.20	52.95	33,210.50	-0.17
2004-05	3,762	5.14	1,78,110	1.84	1,54,818.20	7.79	8,948.00	9.71	33,877.00	2.01
2005-06	3,749	-0.35	1,77,696	-0.23	1,79,440.20	15.90	16,963.90	89.58	43,034.50	27.03
2006-07	3,867	3.15	1,88,227	5.93	2,08,454.00	16.17	20,384.20	20.16	48,169.00	11.93
2007-08	4,096	5.92	2,49,180	32.38	2,51,771.00	20.78	23,524.10	15.40	60,572.70	25.75
AAGR(%)	3.37		3.81		15.01		20.54		14.74	
CAGR(%)	3.29		3.44		12.09		17.13		11.50	

Source: Industryoutlook.cmie.co

**Table 3: Growth of Paper Industry in India during Post-Recession Period:
Data from 2008-09 to 2016-17**

Annual Survey : Manufacture of Paper and Paper Products in India: Data from 2008-09 to 2016-17										
Year	Number of factories		Total employees		Productive capital		Profits		Net value added	
	Numbers	Growth Rate(%)	Numbers	Growth Rate(%)	Rs. million	Growth Rate(%)	Rs. million	Growth Rate(%)	Rs. million	Growth Rate(%)
2008-09	4,637	13.21	2,29,276	-7.99	3,09,109.50	22.77	25,038.50	6.44	67,791.40	11.92
2009-10	4,599	-0.82	2,26,707	-1.12	3,90,879.30	26.45	6,815.30	-72.78	54,144.50	-20.13
2010-11	6,120	33.07	2,47,752	9.28	4,50,384.00	15.22	27,125.20	298.00	86,975.50	60.64
2011-12	6,442	5.26	2,52,356	1.86	4,22,331.30	-6.23	12,679.10	-53.26	81,832.80	-5.91
2012-13	6,488	0.71	2,33,764	-7.37	4,83,287.30	14.43	4,630.30	-63.48	75,056.10	-8.28
2013-14	6,810	4.96	2,46,290	5.36	5,41,590.30	12.06	29,853.30	544.74	1,09,744.70	46.22
2014-15	6,765	-0.66	2,39,457	-2.77	6,09,240.90	12.49	23,072.00	-22.72	1,09,073.30	-0.61
2015-16	6,911	2.16	2,46,333	2.87	5,96,162.60	-2.15	33,846.00	46.70	1,24,333.50	13.99
2016-17	6,900	-0.16	2,51,364	2.04	6,35,180.40	6.54	32,311.60	-4.53	1,26,167.60	1.48
AAGR(%)	6.42		0.24		11.29		75.46		11.03	
CAGR(%)	5.09		1.16		9.42		3.24		8.07	

Source: Industryoutlook.cmie.com

- Number of Factories**

Number of factories includes all registered small, medium and large units engaged in manufacture of paper and paper products in India. As per table 2, number of factories has increased from 2602 units in 1993-94 to 4096 units in 2007-08. As per table 3, number of factories has increased from 4637 units in 2008-09 to 6900 units in 2016-17. This shows increase in number of factories engaged in production of paper in India during both pre and post recession period. As per table 2 and 3, it is observed that almost in all years, growth rate in number of factories has increased especially during 2010-11 when it was highest at 33.07%.

CAGR for post-recession period is 5.09%, which is more than that of pre-recession period which was at 3.29%. Hence, there is significant growth of number of factories during post-recession period.

- Employment**

Employment represents all workers and employees engaged in paper producing units in India. As per table 2, people employed were 1, 55,201 in the year 1993-94 increased to 2, 49,180 in 2007-08. As per table 3, people employed were 2, 29,276 in the year 2008-09 which marginally increased to 2, 51,364 in 2016-17. It is also observed from table 2 that employment grew in most of the years but had highest fall during 1998-99 at -10.26% in spite of growth in number of factories during the year. As per table 3, employment decreased in most of the years especially immediately post-recession in 2008-09 at -7.99%. CAGR of pre-recession period is 3.44% which reduced to almost half in post-recession period at 1.16%.

- **Productive Capital**

Productive capital is the sum of fixed capital and working capital employed in paper manufacturing sector as on closing day of accounting year. As per table 2, productive capital was ₹ 50,924.4 million in the year 1993-94 which increased to ₹ 2, 51,771 million in 2007-08. As per table 3, productive capital was ₹ 3, 09,109.5 million in 2008-09 which increased to ₹ 6, 35,180.4 million in 2016-17.

From table 2, it is observed that productive capital indicated an increase in growth rate each year and is highest at 105.05% in 1994-95. As per table 3, it is observed that positive growth rate has been maintained except in 2011-12 and 2015-16.

CAGR for productive capital for pre-recession period was 12.09% and had slightly come down to 9.42% for the post-recession period.

- **Profits**

Profits represent profit after-tax which is the final residual amount of profit generated. It is calculated as: Total Revenue-Total expenses including tax. As per table 2, profits were ₹ 2569.9 million in the year 1993-94 which increased to ₹ 23,524.1 million in 2007-08. As per table 3, profits were ₹ 25,038.5 million in the year 2008-09 which increased to ₹ 32,311.6 million in 2016-17.

Table 2 shows losses only in few years. Highest loss was in 1995-96 with a negative growth rate at -203.56%. As per table 3, there was no loss in any year but only decline in profits in few years. Highest growth rate was in 2013-14 at 544.74%

CAGR of pre-recession period is 17.13% which has drastically come down to 3.24% in post recession period.

- **Net Value Added**

Net value added is arrived at by deducting total input and depreciation from total output. As per table 2, net value added was ₹ 13,195.7 in 1993-94 million which has increased to ₹ 60,572.7 million in 2007-08. As per table 3, net value added was ₹ 67,791.4 million in 2008-09 which has increased to ₹ 1, 26,167.6 million in 2016-17.

Table 2 shows highest growth rate in net value added in 2000-01 at 84.35%. As per table 3, during post-recession net value added grew most in 2010-11 at 60.64%.

CAGR for net value-added during pre-recession period was 11.5% which slightly came down to 8.07% during post-recession period.

It is concluded that Paper Industry in India has achieved a remarkable growth in terms of number of factories, employment, productive capital, profits and net value added during both pre and post-recession period. In both periods, all parameters show positive AAGR and CGR. However, except number of factories, all parameters show less CGR during post-recession period compared to pre-recession period which shows that Paper industry was adversely affected by the great recession. It is also observed that in spite of growth rate in number of factories during post-recession period, employment has reduced.

- **Results from Hypothesis Testing**

For the measure of significant difference in growth of Paper Industry in India during pre and post-recession period, the study has applied t-test. Independent Samples t-test was conducted on the data to check the validity of the hypothesis.

Table 4 describes the mean, standard deviation and standard error mean for the two groups called pre-recession and post-recession for analysis of five selected growth parameters for Paper Industry in India. The results of t-test are shown in Table 5. As it can be clearly depicted from Table 5, p-value for all the five parameters is less than 0.05 which suggests that hypothesis of the study is rejected. (Chandok and Patel, 2021)

Therefore, we can primarily conclude that there is significant difference in growth of Paper Industry in India during the pre-recession and post-recession period. There can be several reasons attributable to this phenomenon.

Table 4: Group Statistics for Select Parameters for Indian Paper Industry during Pre- Recession and Post- Recession Period

Parameter	Identity	N	Mean	Standard Deviation	Standard Error Mean
Number of Factories	Pre-Recession	15	3307.5333	478.0457	123.4309
	Post-Recession	9	6185.7778	924.6015	308.2005
Total Employees	Pre-Recession	15	179048.0667	21187.81066	5470.6692
	Post-Recession	9	241477.6667	9570.8856	3190.2952
Productive Capital	Pre-Recession	15	139922.0733	49084.4949	12673.5621
	Post-Recession	9	493129.5111	110611.6403	36870.5468
Profits	Pre-Recession	15	6089.5533	8972.5559	2316.7039
	Post-Recession	9	21707.9222	10973.6813	3657.8938
Net Value Added	Pre-Recession	15	30256.9067	13101.3263	3382.7479
	Post-Recession	9	92791.0444	25613.5433	8537.8478

Table 5: Results of t-test for Significant Difference of Growth of Paper Industry in India during Pre-Recession and Post Recession Period

Independent Samples t-Test						
Parameter		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Number of Factories	Equal Variances Assumed	4.043	.057	-10.106	22	0.000
	Equal Variances Not Assumed			-8.669	10.616	0.000
Total Employees	Equal Variances Assumed	0.280	0.602	-8.290	22	0.000
	Equal Variances Not Assumed			-9.858	20.909	0.000
Productive Capital	Equal Variances Assumed	9.984	0.005	-10.831	22	0.000
	Equal Variances Not Assumed			-9.059	9.923	0.000
Profits	Equal Variances Assumed	0.917	0.349	-3.8	22	0.001
	Equal Variances Not Assumed			-3.607	14.383	0.003
Net Value Added	Equal Variances Assumed	9.224	0.006	-7.953	22	0.000
	Equal Variances Not Assumed			-6.809	10.560	0.000

Conclusion

We can primarily conclude that there is significant difference in growth of Paper Industry in India during the pre-recession and post-recession period. In terms of employment, productive capital, profits and net value added, CAGR of post-recession period shows decline compared to pre-recession period. This suggests that the Paper Industry was moderately affected by the recession but the key numbers did not slip into the red. A silver lining in the cloud was that number of factories increased post-recession. However, there is reduction in employment situation post- recession in spite of increase in number of factories. This may be attributable to loss of jobs resulting from technology up gradations and automation in the Paper Industry.

All seemed to be going well with Paper Industry when almost out of the blue major economies of the world derailed due to the Great Recession. The ripple down effect took its toll on paper industry too. Corrective measures by management of paper companies and government intervention can help in the post-recession revival of Paper Industry in India. Increased use of waste paper as raw-material for making new paper, energy-efficient processes; significant reduction in steam, power and water consumption; advancements in the level of automation, training of paper mill staff, adoption of clean and green technologies, and tremendous improvement in the environmental management of the paper mills are the forward-looking measures for paper industries.

Indian paper quality is now matching the international standards. Hence, the Government of India needs to play a crucial role in framing of export promotion policies, revision of rates for incentives under export schemes, promoting Foreign Direct Investment (FDI) in paper sector, etc. With the government's thrust on 'Make in India' initiative, the future of Paper Industry in India is on a growth trajectory. Sustainable progress of Paper Industry in India and at the global level seems to be an achievable feat. This comparison of growth of Paper Industry during pre and post-recession period provides several pointers for future researchers, Government of India, Paper Industry Associations and Manufacturers for sustainability and growth in the long-term. The impact of recession on other agro-based manufacturing industries such as textile, sugar, rubber, wood and wood products, vegetable oils, etc. can be studied. The factors that led to differences in growth of Paper Industry in India before and after the recession period can generate a scope for future research.

The conclusion of any study is based on selected premises. This study uses 15 years pre-recession and 9 years post-recession data, five select growth parameters and use of only t-test to check the differences and test the hypothesis. If these premises undergo changes, future studies can generate different results. The world faced an unprecedented situation with a global pandemic that began in 2020, and continues well into 2022. It has a strong impact on the economic parameters across the globe. This study will be a torch-bearer to explain, analyze and conclude the growth parameters of Paper Industry in India in the uncertain and ambiguous times that follow during and post COVID-19 business scenario.

References

1. Chandok, Y. and Patel, R. (2021). A Comparative Analysis of Growth of Sugar Industry in India during Pre and Post Global Recession Period. *Paripeex-Indian Journal of Research*, 10(2), 11-14.
2. Das, S. (2010). Global Recession and Indian Textile Industry: An Impact Study on HR Practices. *Kegees Journal of Social Science*, 2(2), 231-241.
3. Gopalakrishnan, D.; Anandha kumar, S.; Santhosh kumar, K. and Divya, U. (2010). Global economic challenge and its impact on Indian textiles. Indiantextilejournal.com/articles/FAdetails.asp?id=2680.
4. Kaur, M. and Kiran, R. (2008). Indian Manufacturing Sector: Growth and Productivity under the New Policy Regime. *International Review of Business Papers*, 4(2), 136-150.
5. Madhavi, K. (2014). Working Capital Management of Paper Mills. *International Journal of Research in Business Management*, 2(3), 63-72.
6. Megaladevi, P. (2015). A study on financial performance analysis of the select Paper Company with special reference to Tamil Nadu Newsprint and papers limited. *International journal of Recent Research Aspects*, 2(4), 22-24.
7. Ray, S. (2011). Financial Performance of Paper and Paper Product Companies in India in Post-Liberalisation Period: An Exploratory Study. *Research Journal of Finance and Accounting*, 2(5), 48-59.

Websites

8. www.business-standard.com
9. www.ibef.org
10. www.india.crafts.com
11. www.indiamirror.com/indian-industries/sugar.html
12. www.indiatoday.in
13. www.industryoutlook.cmie.com
14. www.economicstimes.indiatimes.com (article by Swaminathan SA Aiyar).

