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PRODUCTIVITY MANAGEMENT: A CASE STUDY OF STEEL AUTHORITY OF INDIA LTD.

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ABSTRACT

The steel industry is one of the most demanding sectors in the global market, since it requires a systematic increase in productivity in the present scenario the challenges at manpower is best, reduction of demand in cost. Researcher has try to analysis the productivity management of Steel Authority of India Ltd. The Time period was Ten Year from 2010-11 to 2019-20. it is found that material productivity index shows fluctuating trend during study period. Labour productivity trend shows highly increasing trend the study period. Overhead productivity trend is also fluctuating during the study period. The Cha-Square test is significant and in significant. The Trend of Productivity Ratio fluctuating during the study period.

***KEYWORDS**: Global Market, Productivity Management, Overhead Productivity Trend, Productivity Ratio.*

Introduction

Steel industry is flourishing day by day fourth largest steel industry in India. Steel manufacturing by Indian companies are exported across the glob. the quality our steel is considriver. The Steel product is used in automobile industry, infrastructure development industry, and constriction industry. Steel Authority of India ltd is public limited company manage by government. This company is busiest company which represent in entire steel industry. this is government manage company therefore there quality of productivity. it is believe that salaried person or Employees can not work full dedication and efficiency because they feel secure and safety. Quality of row material is very important to increase of productivity in government sector quality check by government officer. Where there is quality interrogative and honest. Therefore researcher selected the topic manage productivity of this unit.

Review of Literature

In 2014, Huges and Thorpe, have identified and studied the factors affecting construction productivity. The study was focus on the building construction projects in the state of Queensland, Australia. The findings of the study conclude that the top three primary factors affecting the productivity of the Australian construction industry were rework, poor supervision, and incomplete drawings. The author's was suggest that the CP could be improved by systematic monitoring and controlling the primary and secondary factors affecting the CP in the Australian environment

Data Analysis

Table No. 1 describes the material productivity ratio and index of material productivity average of material indices, co-efficient of variation and of Steel Authority India Limited.

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Table 1: Analysis of Material Productivity Ratio in Steel Authority India Limited (In Crores)

Year	Output	Input	O/I	Prod.	Trend	I/O
				Index	Value	
2010-11	43,307.36	21,912.27	1.98	100.00	100.31	0.51
2011-12	46,341.79	24,804.77	1.87	94.53	100.45	0.54
2012-13	44,598.26	23,334.91	1.91	96.70	100.60	0.52
2013-14	46,698.41	21,611.97	2.16	109.33	100.74	0.46
2014-15	45,710.78	21,157.56	2.16	109.31	100.89	0.46
2015-16	39,051.88	19,477.37	2.00	101.45	101.18	0.50
2016-17	44,452.41	23,428.90	1.90	96.00	101.32	0.53
2017-18	57,558.46	29,084.63	1.98	100.13	101.47	0.51
2018-19	66,967.31	35,268.19	1.90	96.07	101.61	0.53
2019-20	61,660.55	29,212.87	2.11	106.80	101.76	0.47
TOTAL	4,96,347.21	2,49,293.44	19.97	1010.32	1010.32	5.02
AVE.	49,634.72	24,929.34	2.00	101.03	101.03	0.50
Standard Deviation =			5.6141263732591	Chi-square =		2.79
Co-Efficient of Variance =			5.556764885	A =101.03	B=-0.14	

Table 2: Calculation of Chi-square value of SAIL

Observe	Expected	(O-E)	(O-E)2	(O-E)2/E
100.00	100.31	-0.31	0.10	0.00
94.53	100.45	-5.92	35.10	0.35
96.70	100.60	-3.90	15.17	0.15
109.33	100.74	8.59	73.72	0.73
109.31	100.89	8.43	71.02	0.70
101.45	101.18	0.27	0.07	0.00
96.00	101.32	-5.32	28.33	0.28
100.13	101.47	-1.34	1.78	0.02
96.07	101.61	-5.54	30.66	0.30
106.80	101.76	5.04	25.41	0.25
			Chi-square =	2.79

Table 1 shows Material Productivity of steel authority of India ltd. The output of steel authority of India ltd. shows fluctuation trend and input of steel authority of India ltd. shows fluctuation trend. The productivity ratio was 1.98 in 2010-11.and highest productivity ratio is 2.16 in 2013-14 and 2014-15. 2.00 in the last year. The average ratio is show highly fluctuation trends. Standard deviation is 5.61 and c.v. is 5.56.the chi-square value is 2.79 which lower than calculate value 16.919 hence null hypothesis is accepted and it is conduct that there is no significant different between actual index value of productivity and trend value productivity.

Table 3: Analysis of Labour Productivity in SAIL.(In crores)

Year	Output	Input	O/I	Prod.	Trend	I/O
				Index	Value	
2010-11	43,307.36	7,623.33	5.68	100.00	85.44	0.18
2011-12	46,341.79	7,932.05	5.84	102.84	88.19	0.17
2012-13	44,598.26	8,637.20	5.16	90.89	90.94	0.19
2013-14	46,698.41	9,578.51	4.88	85.82	93.69	0.21
2014-15	45,710.78	9,736.33	4.69	82.64	96.45	0.21
2015-16	39,051.88	9,714.97	4.02	70.76	101.95	0.25
2016-17	44,452.41	8,947.83	4.97	87.45	104.70	0.20
2017-18	57,558.46	8,850.07	6.50	114.48	107.46	0.15
2018-19	66,967.31	8,830.34	7.58	133.50	110.21	0.13
2019-20	61,660.55	8,781.32	7.02	123.60	112.96	0.14
TOTAL	4,96,347.21	88,631.95	56.35	991.99	991.99	1.84
AVE.	49,634.72	8,863.20	5.64	99.20	99.20	0.18
Standard Deviation =			19.6874735373096	Chi-square =		26.32
Co-Efficient of Variance			19.84643618	A =99.20	B =- 2.75	

Table 4: Calculation of Chi-square Value of SAIL

Observe	Expected	(O-E)	(O-E)2	(O-E)2/E
100.00	85.44	14.56	212.11	2.48
102.84	88.19	14.65	214.72	2.43
90.89	90.94	-0.05	0.00	0.00
85.82	93.69	-7.87	62.00	0.66
82.64	96.45	-13.80	190.53	1.98
70.76	101.95	-31.19	972.96	9.54
87.45	104.70	-17.25	297.70	2.84
114.48	107.46	7.03	49.38	0.46
133.50	110.21	23.29	542.27	4.92
123.60	112.96	10.64	113.24	1.00
			Chi-square =	26.32

Table 3 shows Labour Productivity of Steel authority of India Limited. The output of Steel authority of India Limited. shows fluctuation trend and input of Steel authority of India Limited. shows fluctuation trend. The labour productivity ratio was 5.68 in 2010-11.and highest productivity ratio is 7.58 in 2018-19. The average ratio is show highly fluctuation trends. Standard deviation is 19.68 and c.v. is19.84.The chi-square value is 26.32 which greater than calculate value 16.919 hence null hypothesis is accepted and it is conduct that there is significant different between actual index value of labour productivity and trend value labour productivity.

Table 5: Analysis of Overhead Productivity Ratio in Steel Authority of India Ltd. (in Crores)

Year	Output	Input	O/I	Prod.	Trend	I/O
				Index	Value	
2010-11	43,307.36	7684.56	5.64	100.00	89.89	0.18
2011-12	46,341.79	8928.3	5.19	92.10	86.86	0.19
2012-13	44,598.26	10027.59	4.45	78.92	83.84	0.22
2013-14	46,698.41	10695.03	4.37	77.48	80.81	0.23
2014-15	45,710.78	11571.14	3.95	70.10	77.79	0.25
2015-16	39,051.88	12218.3	3.20	56.71	71.74	0.31
2016-17	44,452.41	11917.01	3.73	66.19	68.71	0.27
2017-18	57,558.46	13870.42	4.15	73.63	65.69	0.24
2018-19	66,967.31	15851.29	4.22	74.96	62.66	0.24
2019-20	61,660.55	19023.17	3.24	57.52	59.63	0.31
TOTAL	4,96,347.21	1,21,786.81	42.13	747.61	747.61	2.44
AVE.	49,634.72	12,178.68	4.21	74.76	74.76	0.24
Standard Deviation =			13.6707123916147	Chi-square =		9.33
Co-Efficient of Variance			18.28582304	A=74.76	B=3.03	

Table 6: Calculation of Chi-square value of Steel Authority of India ltd.

Observe	Expected	(O-E)	(O-E)2	(O-E)2/E
100.00	89.89	10.11	102.25	1.14
92.10	86.86	5.24	27.43	0.32
78.92	83.84	-4.92	24.19	0.29
77.48	80.81	-3.33	11.12	0.14
70.10	77.79	-7.69	59.13	0.76
56.71	71.74	-15.02	225.67	3.15
66.19	68.71	-2.52	6.36	0.09
73.63	65.69	7.95	63.18	0.96
74.96	62.66	12.30	151.40	2.42
57.52	59.63	-2.12	4.49	0.08
			Chi-square =	9.33

Table 7 shows Overheads Productivity of Steel authority of India ltd. The output of Steel Authority of India ltd. shows fluctuation trend and input of Steel Authority of India ltd. shows fluctuation trend. The productivity ratio was 3.95 in 2014-15.and highest productivity ratio is 5.64 in 2010-11. Lowest is 3.20 in 2015- 16. The average ratio is show highly fluctuation trends. Standard deviation is 13.67 and c.v. is 18.29.The chi-square value is 9.33 which lower than calculate value 16.919 hence null hypothesis is accepted and it is conduct that there is no significant different between actual index value of productivity and trend value productivity.

Table 7: Analysis of Overall Productivity Ratio in Steel Authority of India Ltd. (in Crores)

Year	Output	Input	O/I	Prod.	Trend	I/O
				Index	Value	
2010-11	43,307.36	37220.16	1.16	100.00	95.04	0.86
2011-12	46,341.79	41665.12	1.11	95.59	94.57	0.90
2012-13	44,598.26	41999.7	1.06	91.26	94.10	0.94
2013-14	46,698.41	41885.51	1.11	95.82	93.63	0.90
2014-15	45,710.78	42465.03	1.08	92.51	93.16	0.93
2015-16	39,051.88	41410.64	0.94	81.05	92.22	1.06
2016-17	44,452.41	44293.74	1.00	86.25	91.76	1.00
2017-18	57,558.46	51805.12	1.11	95.49	91.29	0.90
2018-19	66,967.31	59949.82	1.12	96.00	90.82	0.90
2019-20	61,660.55	57017.36	1.08	92.94	90.35	0.92
TOTAL	4,96,347.21	4,59,712.20	10.79	926.92	926.92	9.30
AVE.	49,634.72	45,971.22	1.08	92.69	92.69	0.93
Standard Deviation =			5.4728277020804	Chi-square =		2.66
Co-Efficient of Variance			5.90429749	A= 92.69	B = 0.47	

Table 8: Calculation of Chi-square value of SAIL

Observe	Expected	(O-E)	(O-E)2	(O-E)2/E
100.00	95.04	4.96	24.65	0.26
95.59	94.57	1.02	1.05	0.01
91.26	94.10	-2.84	8.05	0.09
95.82	93.63	2.19	4.80	0.05
92.51	93.16	-0.65	0.42	0.00
81.05	92.22	-11.17	124.88	1.35
86.25	91.76	-5.50	30.28	0.33
95.49	91.29	4.20	17.66	0.19
96.00	90.82	5.19	26.90	0.30
92.94	90.35	2.59	6.73	0.07
			Chi-square =	**2.66**

Table 7 shows Overall Productivity of Steel Authority of India ltd. The output of Steel Authority of India ltd. shows fluctuation trend and input of Steel Authority of India ltd. shows fluctuation trend. The productivity ratio was 1.06 in 2012-13.and highest productivity ratio is 1.16 in 2010-11. Lowest is 0.94 in 2015-16. The average ratio is show highly fluctuation trends. Standard deviation is 5.47 and c.v. is 5.90.The chi-square value is 2.66 which lower than calculate value 16.919 hence null hypothesis is accepted and it is conduct that there is no significant different between actual index value of productivity and trend value productivity.

Findings

Material Productivity Ratio is find between 1.87 to 2.16 .labour productivity Ratio 4.02 to 7.58overhead productivity Ratio 3.20 to 5.64 and overall Productivity Ratio 0.94 to1.16The trend value shows fluctuating trend index shows increase and decrease trend Material Productivity is find trend value between 100.31 to 101.76.labour productivity trend value 85.44 to 112.96. Overhead productivity trend value 59.63 to 89.89 and overall Productivity trend value 0.86 to 1.06Growth rate is – 0.14 of Material Productivity, -2.75 of labour Productivity , 3.03 of overhead Productivity and 0.47 of overall Productivity. The chi-square value of Material Productivity is 13.4 which lower than calculate value 16.919 hence null

hypothesis is accepted and it is conduct that there is no significant different between actual index value of productivity and trend value productivity. The chi-square value of Labour Productivity is 3.04 which lower than calculate value 16.919 hence null hypothesis is accepted and it is conduct that there is no significant different between actual index value of productivity and trend value productivity. The chi-square value overhead productivity is 6.71 which lower than calculate value 16.919 hence null hypothesis is accepted and it is conduct that there is no significant different between actual index value of productivity and trend value productivity. The chi-square value overall is 3.80 which lower than calculate value 16.919 hence null hypothesis is accepted and it is conduct that there is no significant different between actual index value of productivity and trend value productivity.

Conclusion

From the analysis it is conclusion the material productivity of steel authority India in improve in year to year. The growth rate is negative chi square is in significant result. From the analysis it is conclusion the labour productivity of steel authority India in improve in year to year. The growth rate is negative chi square is in significant resultfrom the analysis it is conclusion the overhead productivity of steel authority India in improve in year to year. The growth rate is positive chi square is in significant result from the analysis it is conclusion the overall productivity of steel authority India in improve in year to year. The growth rate is positive chi square is in no significant result

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