

**INDIAN ECONOMY AT A CROSSROAD – AN INDEPTH STUDY OF ITS
MANUFACTURING SECTOR (ALUMINIUM AND ALUMINIUM PRODUCTS)
FROM 2000 TO 2015.**

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Purpose of this paper	“Make in India” is a campaign which is backed by the present Government. When we are inviting other manufacturing companies on our soil a peek into the already existing players should help prospective players to test the waters.
Design/methodology /approach	CMIE’s Prowess Database is a comprehensive database offering historical and present data on a whole set of indicators. For understanding past performance, operating expenses as a percentage of sales and predicting future performance total outside liabilities over total net worth have been taken for study. A sixteen year period from the year 2000 to 2015 has been selected. It is an exhaustive time to arrive at a concrete representation of performance. Only fifteen companies in the Aluminium sector have been taken. A similar study can be done for all the other sectors.
Findings	In the final analysis for operating expenses as percentage of sales for the aluminium industry, out of fifteen companies 2 are in the Danger zone, 2 are highly worrisome, 3 are giving little worries, 5 are stable and only 3 companies have improved in the period under question.
Research limitations	Only two indicators have been taken for study. But there are many factors which will help in rationalizing the performances of companies.
Practical implications	Technical analysis which is becoming a fad for predicting stock markets has weak roots. Fundamental analysis will always remain a central concept for evaluating actual performances of companies.
Social Implications	Before inviting guests over lunch, we should see that proper food has been prepared and there is enough for family members. Companies which are already operating for so many years, if they are finding the goings tougher for them there is no sense in inviting others and creating a resource crunch.

<p>What is original/value of paper</p>	<p>The paper deals with an in depth analysis. The “Make in India” campaign should highlight the fact that most of the companies of most of our manufacturing sectors are giving excellent returns to the stakeholders and there is enough scope for others to contribute to the explosive growth which this great country is going to experience as manifest in the stock markets.</p>
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ABSTRACT

Manufacturing sector of any country is the backbone of its economy¹. An efficient and robust manufacturing sector is a precursor to a sustainable economic development. In the present study the authors have carried out a detailed time series analysis of the Indian Manufacturing companies. Two key indicators have been chosen for study i.e Operating Expenses as a percentage of sales and change in stock (read “Sales and change in stock” as one word) and Total Outside Liabilities as a percentage of Total Net Worth for a company (TOL / TNW). Total number of companies in the Manufacturing sector are approximately 10,290². But, when the indicators were sifted for a period of sixteen years only 1931 companies could stand the test of providing data on these two indicators. Other companies did not have complete data for the period under study. So, finally these 1931 companies were chosen for analysis.

These companies were further categorised on the basis of their nearness to the customer. This categorisation is arbitrary and based on the author’s judgement. It is explained later. Second level categorisation is as per the Industry group. In all 98 industry groups were identified by the Prowess database. If the operating expense as a percentage of sales decreases for a company it is a good sign and a manifestation of Productivity and Efficiency. On the other hand if it is increasing over the years it reflects decreasing efficiency and bad times ahead. Moreover, a similar trend for TOL / TNW is also an indicator of sustainable profitability and a bright future. Finally, a correlation study between the two will identify companies for whom a few nails have been struck in their coffin and those for whom there is still time to gain control over their belongings.

¹ SME’s Role in India’s Manufacturing Sector – India Brand Equity Foundation ; www.ibef.org

² CMIE’s Prowess. (Centre For Monitoring Indian Economy).

KEYWORDS – Operating Expenses as a percentage of Sales and Change in Stock (OPOS), Total Outside Liabilities over Total Net Worth (TOL / TNW),

INTRODUCTION

The “Make In India” campaign which is being run diligently by the present Government has a strong underlying note for Foreign Multinationals to setup or revamp their manufacturing bases in India. It is but logical to first analyse the position of manufacturing companies which are already operating in the country. Many of them are in existence for the past fifty years or more. The final analysis will throw light on the state of affairs of the existing companies and will also provide others an opportunity to test the waters for setting up new bases.

The key indicators chosen for analysis are OPOS and TOL/TNW. Other details are:

Manufacturing Sector – Approximately 10,290 companies.

Time Period – Sixteen Years (from 2000 TO 2015)

Indicators – Operating expenses as a percentage of sales and the ratio of Total outside liabilities to Total Net Worth.

Available Data – Out of 10,290 companies for the time period under question, data is consistently available for only 1930 companies.

RESEARCH METHODOLOGY

All the data is aggregate secondary data of all companies for the manufacturing sector, collected from CMIE’s **Prowess database**. Simple Bi-variate correlation has been employed by the researchers in calculating growth rates. Data has been collected for sixteen years i.e. from 2000 to 2015.

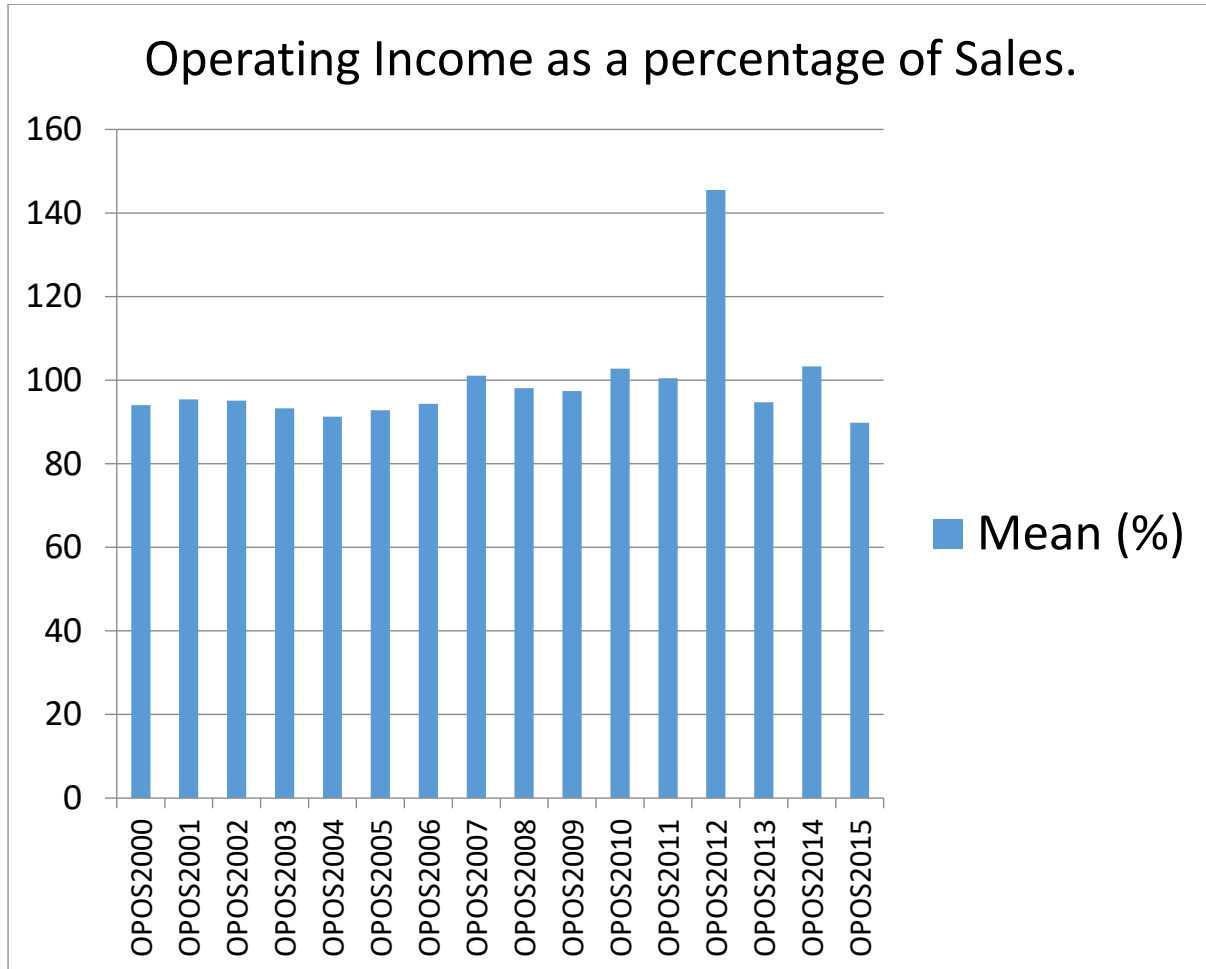
MACRO ANALYSIS - The Table below depicts the Annual Mean of Operating expense as a percentage of Sales (OPOS) for all 1930 Companies from 2000 TO 2015.

TABLE NO -1

	Mean (%)
OPOS2000	94.03
OPOS2001	95.38
OPOS2002	95.08
OPOS2003	93.26
OPOS2004	91.30
OPOS2005	92.80
OPOS2006	94.33
OPOS2007	101.06
OPOS2008	98.09
OPOS2009	97.38
OPOS2010	102.78
OPOS2011	100.48
OPOS2012	145.52
OPOS2013	94.69
OPOS2014	103.26
OPOS2015	89.80

Below is the graph for the above table.

GRAPH NO.1



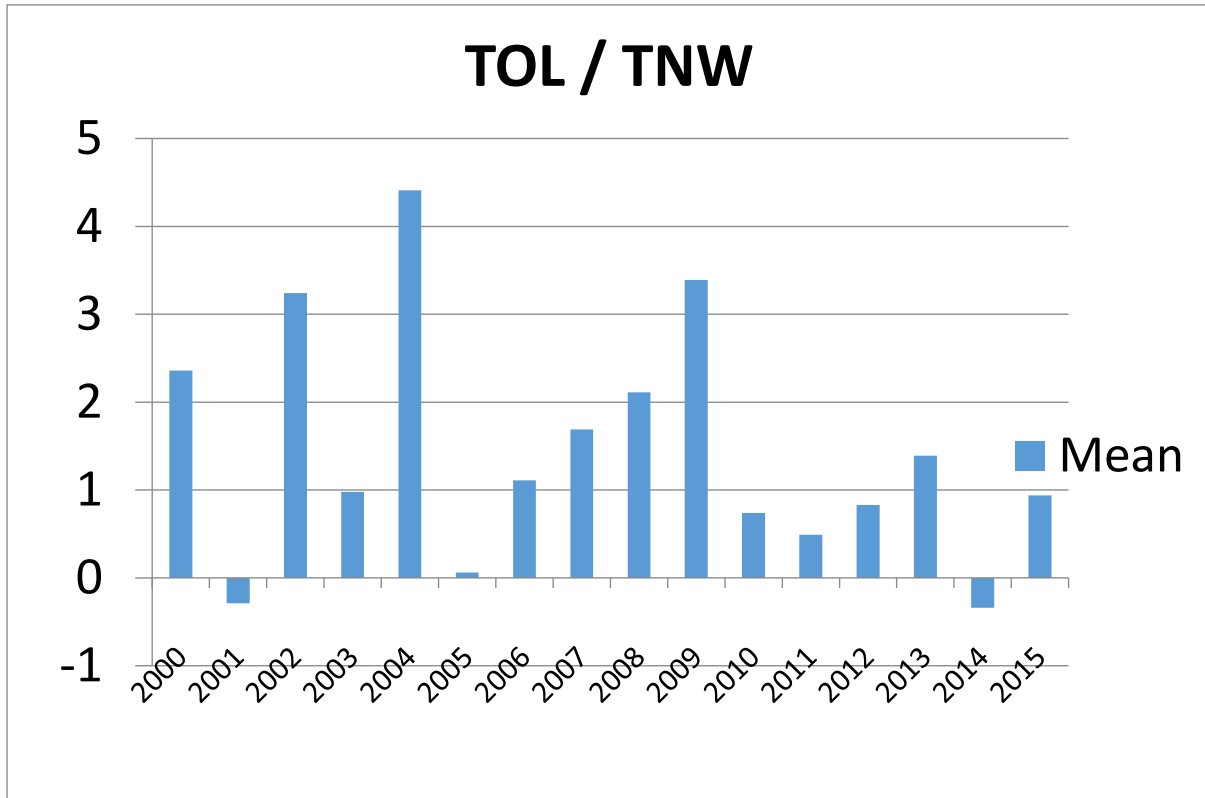
Above is a mean figure and we can see that it has fluctuated over the years and finally ended on a positive note. For example, for the year 2000 even though the overall mean is 94.3, operating expenses for an efficient company may be 25.00 whereas for an inefficient company it can go up to 150.00 %. But for all the 1930 companies taken together their arithmetic mean is 94.03. Collectively seen this figure has crossed the 100% barrier and gone up to 145% ! in 2012. It has finally ended at 90% in 2015. But for the country as a whole the trend is worrisome.

TABLE NO. 2

Annual Mean of the ratio of Total Outside Liabilities to Total Net Worth (TOL / TNW)

	Mean
TOL2000	2.36
TOL2001	-.29
TOL2002	3.24
TOL2003	.98
TOL2004	4.41
TOL2005	.06
TOL2006	1.11
TOL2007	1.69
TOL2008	2.11
TOL2009	3.39
TOL2010	.74
TOL2011	.49
TOL2012	.83
TOL2013	1.39
TOL2014	-.34
TOL2015	.94

GRAPH NO. 2



Collectively speaking, trend for this indicator is a solace except for 2007,2008 and 2009. A negative ratio indicates that money is lent.

FIRST LEVEL CLASSIFICATION –

For a deeper analyses, these 1930 companies have been further classified into four groups on the basis of their nearness to the customers. They are

1. Basic Industries They are those which are the farthest from the customer. (for e.g Steel).
2. Basic Intermediate – These industries come next in the value chain. (for e.g Agricultural Machinery)
3. Customer Intermediate – Those which feed customer goods industries (for e.g Cement products) and
4. Customer goods which are the nearest (for e.g Two and Three wheelers).

The concept is, a consistently high opos in the basic industries will not portend good for those which are lower in the value chain. So a comparative figure will give us a better picture among these groups.

TABLE NO. 3

Annual Mean of Operating expense as a percentage of Sales (OPOS) for all 1930 Companies from 2000 TO 2015 further grouped on the basis of nearness to the customer.

	INDUSTRY BASIC CODES			
	Basic	Basic Intermediate	Customer Intermediate	Customer Goods
	Mean	Mean	Mean	Mean
OPOS2000	97.86	92.00	92.20	102.07
OPOS2001	83.71	93.58	99.57	93.26
OPOS2002	52.59	104.75	93.94	96.29
OPOS2003	93.73	92.63	92.84	95.72
OPOS2004	96.09	82.40	95.99	96.42
OPOS2005	90.77	91.20	94.59	92.46
OPOS2006	92.00	91.10	97.13	95.02
OPOS2007	93.59	91.25	112.36	95.39
OPOS2008	113.50	89.75	104.40	92.23
OPOS2009	94.99	94.32	99.79	98.79
OPOS2010	90.55	89.31	120.90	88.56
OPOS2011	101.75	96.48	105.33	95.32
OPOS2012	97.94	236.44	93.11	106.60
OPOS2013	103.81	88.73	95.56	101.72
OPOS2014	87.41	117.74	96.60	96.00
OPOS2015	89.80	88.61	103.04	98.69

The arrows help us to discern the effects of an increase in the operating expenses of Basic goods in the increased percentage of Intermediate goods after a time lag of 3 to 5 years.

TABLE NO. 4

	INDUSTRY BASIC CODES			
	1.00	2.00	3.00	4.00
	Mean	Mean	Mean	Mean
TOL2000	4.55	4.80	.24	1.66
TOL2001	-5.18	1.78	-1.83	1.56
TOL2002	4.91	5.42	.75	4.40
TOL2003	-.30	-.04	1.46	2.61
TOL2004	.83	.59	8.99	1.99
TOL2005	-.59	-2.67	1.58	2.40
TOL2006	-.18	1.59	.96	1.07
TOL2007	1.59	1.28	2.15	1.40
TOL2008	6.95	2.37	1.31	1.49
TOL2009	1.94	7.66	.78	1.52
TOL2010	.50	1.58	.36	.00
TOL2011	-1.99	.04	1.70	-.71
TOL2012	2.24	-2.78	3.21	1.75
TOL2013	1.72	1.31	1.30	1.65
TOL2014	4.47	.37	-3.35	4.30
TOL2015	2.41	1.37	.24	1.26

A high TOL / TNW ratio threatens the long term sustainability of profits for companies. As per the above table every group has had its' highs and lows for this indicator. These have been marked in bold for each group. A negative ratio indicates it has lent money.

SECOND LEVEL CLASSIFICATION -

For further granularity, the companies have been classified on the basis of their industries. 98 groups have been formed as under.

TABLE NO 5.

	INDUSTRY	CODE	basic code
1	ABRASIVES	301	3
2	AGRICULTURAL MACHINERY	201	2
3	AIRCONDITIONERS AND REFRIGERATORS	302	3
4	ALUMINIUM AND ALUMINIUM PRODUCTS	202	2
5	BAKERY PRODUCTS	401	4
6	BEER AND ALCOHOL	402	4
7	BOILERS AND TURBINES	203	2
8	BOOKS AND CARDS	403	4
9	CASTING AND FORGING	204	2
10	CAUSTIC SODA	303	3
11	CEMENT	205	2
12	CEMENT PRODUCTS	304	3
13	CLOTH	305	3
14	COCOA PRODUCTS AND CONFECTIONERY	404	4
15	COFFEE	405	4
16	COMMERCIAL VEHICLES	406	4
17	COMMUNICATION EQUIPMENT	206	2
18	COMPUTERS AND PERIPHERALS	306	3
19	CONSUMER ELECTRONICS	307	3
20	COPPER AND COPPER PRODUCTS	207	2
21	COSMETICS TOILETRIES SOAPS AND DETERGENTS	407	4
22	COTTON AND BLENDED YARN	208	2
23	DAIRY PRODUCTS	408	4
24	DIVERSIFIED	409	4
25	DIVERSIFIED COTTON TEXTILE	308	3
26	DIVERSIFIED MACHINERY	209	2
27	DRUGS AND PHARMACEUTICALS	309	3

28	DRY CELLS	410	4
29	DYES AND PIGMENTS	310	3
30	ENGINES	210	2
31	FERTILIZERS	311	3
32	FERRO ALLOYS	211	2
33	FLORICULTURE	411	4
34	FOOTWEAR	412	4
35	GEMS AND JEWELLERY	413	4
36	GENERAL PURPOSE MACHINERY	212	2
37	GENERATORS TRANSFORMERS AND SWITCHGEARS	312	3
38	GLASS AND GLASSWARE	313	3
39	GRANITE	314	3
40	INDUSTRIAL COOLING EQUIPMENT	315	3
41	INDUSTRIAL MACHINERY	213	2
42	INDUSTRY GROUP	214	2
43	INORGANIC CHEMICALS	316	3
44	LUBRICANTS ETC	414	4
45	MACHINE TOOLS	317	3
46	MAN MADE FILAMENT AND FIBRES	215	2
47	MARINE FOODS	318	3
48	MEDIA PRINT	319	3
49	METAL PRODUCTS	320	3
50	MILLING PRODUCTS	321	3
51	MINING AND CONSTRUCTION EQUIPMENTS	216	2
52	miscellaneous manufactured articles	322	3
53	MISC ELECTRICAL MACHINERY	217	2
54	ORGANIC CHEMICALS	323	3
55	OTHER AGRICULTURAL PRODUCTS	324	3
56	PAINTS AND VARNISHES	325	3
57	PAPER AND NEWS PRINT	326	3
58	PAPER PRODUCTS	327	3
59	PASSENGER VEHICLES	415	4
60	PESTICIDES	328	3
61	PIG IRON	11	1
62	PLASTIC FILMS	12	1
63	PLASTIC FURNITURE AND FLOORINGS	329	3
64	PLASTIC PACKAGING GOODS	330	3
65	PLASTIC TUBES AND PIPES	331	3
66	POLYMERS	13	1
67	POULTRY AND MEAT PRODUCTS	416	4
68	PROCESSED FOODS	417	4

69	READYMADE GARMENTS	418	4
70	REFINERY	14	1
71	REFRATORIES	15	1
72	RUBBER PRODUCTS	332	3
73	SODA ASH	333	3
74	SPONGE IRON	16	1
75	STARCHES	218	2
76	STEEL	17	1
77	STEEL PIPES AND TUBES	219	2
78	STORAGE BATTERIES	334	3
79	SUGAR	335	3
80	SYNTHETIC RUBBER	220	2
81	TEA	419	4
82	TEXTILE PROCESSING	18	1
83	TOBACCO PRODUCTS	336	3
84	TWO AND THREE WHEELERS	420	4
85	TYRES AND TUBES	337	3
86	VEGETABLE OIL AND PRODUCTS	338	3
87	WIRES AND CABLES	221	2
88	WOOD	339	3
89	OTHER AUTOMOBILE ANCILLIARIES	222	2
90	OTHER CHEMICALS	223	2
91	OTHER CONSTRUCTION MATERIAL	224	2
92	OTHER DOMESTIC APPLIANCES	340	3
93	OTHER ELECTRONICS	225	2
94	OTHER INDUSTRIAL MACHINERY	226	2
95	OTHER LEATHER PRODUCTS	341	3
96	OTHER NON FERROUS METALS	227	2
97	OTHER TEXTILES	228	2
98	OTHER TRANSPORT EQUIPMENTS	229	2

The following table gives an idea on the kind of analysis that can be carried out on all the industries. For example we have taken the Aluminium & Aluminium products industry with its fifteen companies. The final picture which evolves categorises a company as

1. Danger (If the increase in OPOS is very high)
2. Worrisome (Medium)
3. Worrisome (Small)
4. Stable
5. Improved

TABLE NO 6. -

		Opos 2000	Opos 2001	.....	Opos 2014	Opos 2015	Trend
1	Alicon Castalloy Ltd.	84.94	80.92	.....	91.31	91.15	Worrisome (S)
2	Bharat Aluminium Co. Ltd.	88	97.7	.....	92.21	96.63	Stable
3	Bhoruka Aluminium Ltd.	96.72	96.39	.....	136.69	433.33	Danger
4	Century Extrusions Ltd.	106.69	104.69	.....	95.7	94.87	Improved
5	Golkonda Aluminium Extrusions Ltd.	102.75	102.96	.....	710	710	Danger
6	Gujarat Foils Ltd.	96.01	97.19	.....	89.67	88.99	Improved
7	Hind Aluminium Inds. Ltd.	95.79	92.14	.....	96.72	96.58	Stable
8	Metal Powder Co. Ltd.	77.57	78.98	.....	84.1		Worrisome (S)
9	National Aluminium Co. Ltd.	53.06	51.34	.....	83.04	74.95	Worrisome (M)
10	Nirav Commercials Ltd.	99.02	103.16	.....	96.44	99.12	Stable
11	P G Foils Ltd.	93.76	95.27	.....	99.46	95.63	Stable
12	Sacheta Metals Ltd.	80.18	89.52	.....	93.77	95.24	Worrisome (M)
13	Sudal Industries Ltd.	96.32	97.23	.....	91.31	96.56	Stable
14	Sundaram-Clayton Ltd.	88.95	88.56	.....	91.53	91.38	Worrisome (S)
15	Synthiko Foils Ltd.	97.47	107.59	.....	93.38	93.9	Improved

As we can see in the final granular analysis for the aluminium industry out of fifteen companies 2 are in the Danger zone, 2 are highly worrisome, 3 are giving little worries, 5 are stable and only 3 companies have improved.

A similar study can be done for the other indicator i.e TOL / TNW.

TABLE NO 7.

		OL/NW 2000	OL/NW 2001	OL/NW 2007	OL/NW 2014	OL/NW 2015	Trend
1	Alicon Castalloy Ltd.	1.6	1.82	3.71	1.72	2.16	Worrisome (M)
2	Bharat Aluminium Co. Ltd.	0.59	0.53	1.27	1.49	1.65	Worrisome (S)
3	Bhoruka Aluminium Ltd.	480.5	48.15	7.44	0.42	0.37	Drastic Improvement
4	Century Extrusions Ltd.	1421	-20.35	2.45	1.61	1.44	Drastic Improvement
5	Golkonda Aluminium Extrusions Ltd.	-5.01	-3.08	4.57	-1.18	-1.18	Stable
6	Gujarat Foils Ltd.	0.61	0.63	2.57	4.56	5.46	Danger
7	Hind Aluminium Inds. Ltd.	0.43	0.17	1.42	1.43	2.23	Worrisome (M)
8	Metal Powder Co. Ltd.	0.26	0.28	0.33	0.14		Stable
9	National Aluminium Co. Ltd.	0.31	0.37	0.11	0.26	0.15	Stable
10	Nirav Commercials Ltd.	0.27	0.42	0.43	0.08	0.06	Stable
11	P G Foils Ltd.	0.47	0.44	0.61	0.88	1.48	Worrisome (S)
12	Sacheta Metals Ltd.	0.24	0.52	1.55	0.9	0.99	Worrisome (S)
13	Sudal Industries Ltd.	-14.36	-6.55	-8.91	2.43	4.18	Worrisome
14	Sundaram-Clayton Ltd.	0.49	0.54	0.91	1.56	1.43	Worrisome (S)

15	Synthiko Foils Ltd.	1.88	1.77	3.71	2.83	2.89	Worrisome (S)
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COMBINED TABLE – TABLE NO. 8

SN.	NAME OF THE COMPANY	OPOS	TOL / TNW	COMBINED VIEW	BI VARIATE CORRELATION
1	Alicon Castalloy Ltd.	Worrisome (S)	Worrisome (M)	WORRISOME (M)	0.26
2	Bharat Aluminium Co. Ltd.	Stable	Worrisome (S)	WORRISOME (S)	(-) 0 .04
3	Bhoruka Aluminium Ltd.	Danger	Drastic Improvement	STABLE	(-) 0.10
4	Century Extrusions Ltd.	Improved	Drastic Improvement	IMPROVED	0.49
5	Golkonda Aluminium Extrusions Ltd.	Danger	Stable	WORRISOME (S)	0.10
6	Gujarat Foils Ltd.	Improved	Danger	WORRISOME (S)	(-) 0.73
7	Hind Aluminium Inds. Ltd.	Stable	Worrisome (M)	WORRISOME (S)	0.28
8	Metal Powder Co. Ltd.	Worrisome (S)	Stable	STABLE	0.21
9	National Aluminium Co. Ltd.	Worrisome (M)	Stable	WORRISOME(S)	(-) 0.01
10	Nirav Commercials Ltd.	Stable	Stable	STABLE	0.27
11	P G Foils Ltd.	Stable	Worrisome (S)	WORRISOME (S)	(-) 0.04
12	Sacheta Metals Ltd.	Worrisome (M)	Worrisome (S)	DANGER	0.53
13	Sudal Industries Ltd.	Stable	Worrisome	STABLE	(-) 0.27
14	Sundaram-Clayton Ltd.	Worrisome (S)	Worrisome (S)	DANGER	0.67

15	Synthiko Foils Ltd.	Improved	Worrisome (S)	STABLE	(-) 0.30
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BI-VARIATE CORRELATION.

If a correlation study is carried out between the two indicators and a positive correlation which is statistically significant (we have not carried out any statistical analysis, it is beyond the scope of this paper) for a company emerges it implies a very precarious position for the company. It portrays that a company's operating expense is increasing and at the same time its' outside liabilities as a percentage of it's net worth is also increasing. If on the other hand, both are decreasing then also Pearsons product moment correlation coefficient ' r ' will still show a positive correlation which in fact is a good sign. So just by looking at 'r' depiction will not be complete.

Furthermore, if one indicator decreases and the other increases it will show a negative correlation and the negative sign will not reflect as to which indicator is improving and which one is deteriorating. For a complete representation, both the columns will have to be read in conjunction.

CONCLUSION

"Make in India" is a campaign which is backed by the present Government. When we are inviting other manufacturing companies on our soil a peek into the already existing players should help prospective players to test the soil.

This paper has dealt with an in depth analysis. The "Make in India" campaign has highlighted the fact that most the companies, of most of our manufacturing sectors are giving good performance and there is enough scope for others to contribute to the explosive growth which this great country is going to experience as manifest in the stock markets. But, still the question remains that if the existing companies have such high operating ratios then how do we safeguard the long term existence and sustainability of these companies?

REFERENCES AND TOOLS USED.

1. Centre For Monitoring Indian Economy – CMIE's Prowess Database.
2. SPSS – Statistical Package For Social Sciences.

