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## ECONOMIES OF SCALE: AN EVIDENCE FROM CROSS SECTIONAL ANALYSIS OF FIRMS IN INDIAN TEXTILE INDUSTRY

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### ABSTRACT

*Economy of scale is a theory which provides a way of understanding the relationship between size of a firm and its profits. It asserts that the efficiency of a firm increases as there is an increase in its size, resulting in cost saving and increased profits. The present study aims at the analysis of internal economies of scale derived by the firms in the textile industry in India. As textile industry is one of the large scale industries characterized by substantial degree of operating leverage, the study of economies of scale provides valuable insights in understanding the efficiency in functioning of the firms in the industry. The sample of the study is 172 firms across nine different sub-sectors of the industry. Data on Net sales, Net profit and Net profit ratio for the financial year ending 31<sup>st</sup> march, 2013, are used as basis for cross-sectional analysis of economies of scale in the textile industry. The study unveils that the textile industry in India is not experiencing considerable economies of scale in its business operations. However, firms in general and processing sub-sectors are receiving moderate level of economies of scale in their business operations. The study also discloses that there is no significant difference in profitability of the firms across different sub-sectors of the textile industry.*

### KEYWORDS

correlation analysis, economies of scale and Indian textile industry.

### JEL CLASSIFICATION

D00, D24, D51.

### 1. INTRODUCTION

Economies of scale is one of the important theories in managerial economics, which proposes the functional relationship between scale of operations of a firm and its returns. The theory postulates in the initial stage of increase in scale of operation, increase in profits will be more than increase in sales. In the succeeding stage, increase in sales and increase in profits will be on the same level and in the final stage, increase in sales will be more than the increase in profits. Economies of scale can be observed in long-term horizons of operations of the firm, as it is possible to increase the level of operation of a firm only in the long run. Economies of scale is based on an assumption that all the factors of production, except technology are variable.

Theory of economies of scale helps an entrepreneur in understanding his/her firm's present phase in economies of scale. In order to prevent a firm from entering itself into diminishing returns stage, the firm has to upgrade its technology so that they will revert to increasing returns state. Compare to firms in technologically developed countries, firms in developing or underdeveloped countries will enter into diminishing returns stage sooner or later. So understanding the practical implications of law of returns to scale is quite essential for the firms in developing countries like India.

Even today, many industries in India are lagging behind in upgrading themselves with the latest innovations in production process. It is possible for a firm to acquire advanced technology through joint ventures or strategic alliances with the firms which are possessing advanced technology in production process. Foreign Direct Investment in the form of technology transfers should be encouraged by the policymakers of the developing nations.

#### 1.1 INTERNAL AND EXTERNAL ECONOMIES OF SCALE

Economies of scale can broadly be divided into two types i.e. internal economies of scale and external economies of scale. Internal economies will appear commonly in the form of technical economies, purchasing economies, administrative economies, financial economies and risk bearing economies. Technical economies manifest unleashing of hidden potentials in the existing technology due to its maximum utilization. Investment in technology is a sunk cost, so increase in production does not require additional cost on technology. As the level of operations increases, a firm can procure its inputs for production at relatively lower rate due to lower costs of purchasing, which is referred as purchasing economies. A firm which elevates its level of operations can utilize skill, knowledge and experience of the employees to its maximum extent. In most of the organized sectors labor cost is a fixed cost and so increase in production may not result in proportionate increase in labor cost.

As the level of operations of a firm heightened, it can also derive savings in the form of administrative economies, because a growing firm can utilize managerial skill and talent to its maximum possible extent. A large scale firm can also get benefits in raising long term capital through different sources of financing. A large capitalization firm can issue shares in the market at comparatively higher amount of premium and in the same way it can raise debt capital at cheaper rate of interest due to its credit worthiness in the market. Large firms can edge their business risk effectively by using various risk management techniques like taking position in forward or future contracts, buying call or put option and entering into forward agreements in the forms of currency or interest rate swaps to hedge currency risk or interest rate risk as the case may be.

Unlike internal economies of scale, External Economies of Scale are augmented due to expansion of industry as a whole, when an industry expands by virtue of favorable conditions prevailing in the economy. Expansion of industry in a particular geographical area will bring some advantages, which are called economies of concentration. As industry expands, the ancillary industries which are dependent on primary industries will also experience better prospects. Government also encourages growing industries by providing various infrastructure facilities like power, transportation, banking etc. Industries which are in growth stage will achieve surplus production in home country, which can be exported outside India which eventually improves foreign exchange reserves of the home country. So the policy makers should also give priority to growing industries in their foreign trade policies. Understanding the insights into the potential economies of scale is conducive for effective formation and implementation of various export promotion policies like special economic zones, export oriented units etc. which provides many tax incentives to the exporting firms. Expansion of industry implies that number of firms in the industry is also increasing. To protect the common interest of all the



firms in the industry, they can form as a group in the name of trade associations. Trade associations play a vital role in negotiating with policy makers, to frame the policies favorable for the growth of the firms in the industry. As an industry expands, there will be a greater scope for establishing research institutions collectively by the firms in the industry, to bring innovations in the production process. Growing industries also provide scope for specialization in their business process. Vertical integration of firms can also be witnessed in growing industries which can facilitate effective control on the distribution channels of the firms.

### 1.2. FIRMS STRATEGIC INTEREST TO LIMIT THE SCALE OF OPERATIONS IN DYNAMIC BUSINESS ENVIRONMENT

Increased competitiveness in the business is transforming firm's outlook towards enhancing their level of operations. As a firm increases its scale of operations, it as to raise its investments in long term assets. Possessing long term assets will increase the operating leverage of the firm and makes the cost structure of the firm more rigid. Firms having higher amount of fixed cost will find it difficult to adjust their level of operations to the change in demand in the market. In the present open market economic system, it is essential for a firm to have flexible cost structure so that it can adjust itself effectively to the changing business conditions. The recent experience of corporate financial management reveals the fact that firms instead of raising their investment in fixed assets, inclined to adopt alternative ways of acquiring the assets. In order to maintain lower level of operating leverage many of the firms in the recent past, prefer to acquire assets on operating lease in a periods of good market demand. Outsourcing a part of production process is also a strategy used by firms to avoid the problems with excess investments in fixed assets.

## 2. TEXTILE INDUSTRY PROFILE

In India, textile industry occupies the second largest employment provider to the people after the agriculture sector. The contribution of Indian textile industry is 14% to the industrial production, 4% to the GDP and 11% to the country's export earnings<sup>(1)</sup>. Textile Industry has the capacity to produce a variety of products suitable for different market segments, both within and outside the country. Textile industry include the sub sectors like organized Cotton/Man-Made Fiber Textiles Mill industry, the Man-Made Fiber/Filament Yarn Industry, the Wool and woolen Textiles Industry, the Sericulture and Silk Textiles Industry, Handlooms, Handicrafts, the Jute and Jute Textiles Industry, and Textiles Exports. In the global market, exports of clothing, as per the WTO data, in the year 2010 India ranked as the sixth largest exporter across the world<sup>(2)</sup>. India is also enjoying the significant lead in terms of labor cost per hour over the developed countries like US and newly industrialized economies like Hongkong, Taiwan, South Korea and China. In twelfth five years plan period, the planning commission approved for allocation of Rs. 11,952.80 crore under the Technology Up-gradation Scheme (TUFs)<sup>(3)</sup>. This is mainly to encourage investments in the sector, especially in the area of modernization, spinning and processing capabilities along with these entering in to new markets and products. After the agriculture sector, handlooms weaving placed one of the largest economic activities for providing direct and indirect employment to more than 43 lakhs weavers and allied workers<sup>(4)</sup>. The contribution from the handloom weaving is nearly 15% of the cloth production in the country and also contributes 95% of export over the world<sup>(5)</sup>. In the 10<sup>th</sup> five-year plan, the Scheme for Integrated Textile Parks (SITP) was introduced for providing the world class infrastructure facilities in setting up textile units. Technical textile industry has the current market size of Rs. 57,000 crores and the growth rate has increased from 11% to almost 20% in 12th five year plan<sup>(6)</sup>. Textile industry is providing health insurance scheme for the benefit of handloom weavers and their families.

## 3. LITERATURE REVIEW

**G.S. Gupta (1975)**<sup>(7)</sup> conducted a study on economies of scale in Indian Cement Industry by using time series and cross sectional data. The study has observed that the cement companies have not reached their optimum size. The study has suggested that significant economies of scale exist only in case of labor cost. The inter-regional comparison of the economies of scale in cement industry unearths the fact that expansion of the industry is beneficial to the states other than Bihar and Madras and contraction of the industry is advantageous only in Madras from the view point of cost economies.

**John Arndt et.al., (1975)**<sup>(8)</sup> have examined the economies of scale in grocery retailing by small size grocery stores and supermarkets in Norway. 10% of the grocery stores and general stores in the selected trade regions of Norway have been selected for analysis. The study brings to light an interesting finding that the economies of scale melt down as grocery stores become supermarkets by the substantial increase in their scale of operations. The results of the analysis are contrary to the classic theory on economies of scale. Such polarized findings of the study can be attributable to the inefficient management of the large scale business operations by the supermarkets. Because the supermarkets in Norway are still in nascent stage.

**Warapatr Todhanakasem et.al., (1986)**<sup>(9)</sup> the study focused on economies of scale and organizational efficiency in commercial banks. The overall results of the study, indicates that there are larger economies of scale for branch banks than unit banks. Branch form of organization should be encouraged by regulators instead of unit form of organizations. The study suggests that affiliated banks should be encouraged by their holding banks. The study also concludes that in banking industry, there is an overinvestment in the facilities which are not utilized to its optimum extent and it results in increased operating leverage.

**David A. Latzko et.al., (1998)**<sup>(10)</sup> conducted a study on economies of scale in mutual fund administration by using a cross sectional sample of 2610 mutual funds and controlling for 22 different investment objectives. In this study, the elasticity of fund cost with respect to fund assets is significantly less than one for all categories of size of the fund. The study brings to light that the average cost curve of select mutual funds is downward sloping. So it can be concluded that mutual funds are yielding economies of scale.

**Jayan Jose Thomas (2003)**<sup>(11)</sup> examined regional disparities and technological developments in production process in different regions in India. The study points out that regional disparity strongly exists in India. Due to imbalances in industrial development among different regions in India, all the regions in India are not in a position to get economies of scale on the similar level.

## 4. IMPORTANCE OF THE STUDY

Managerial economics provides foundation for managerial decision making. Application of theories of managerial economics like theory of demand and supply, theory of production function, market structures, Economies of scale provides valuable insights into the nature of problems faced by a firm in its decision making. Understanding the theoretical and empirical relevance of theory of economies of scale sheds light on the advantages and disadvantages a firm may experience in the course of expansion of its level of business operations. Textile industry is one of the industries which is a backbone to the Indian economy. The Textile industry is a heavy industry which consists of large amount of operating leverage in its cost structure because of the employment of sophisticated plant and machinery in operating activities. It is an imperative need of the industry to make the production on large scale in order to make the optimum utilization of the existing production facilities. In the light of cost structure of the industry characterized by large amount of operative leverage, analysis of economies of scale of the industry provides valuable insights into the competitiveness of the firms in the industry in the present scenario.

## 5. OBJECTIVES

The study aims at the analysis of economies of scale existing in the textile industry in India. The economies of scale are examined across different sub-sectors of the industry. The study also covers the analysis of profitability of the firms in textile industry.

## 6. HYPOTHESIS

**Null Hypothesis (H<sub>0</sub>):** Economies of scale are not existing in the sub-sectors of Indian Textile Industry and textile industry as a whole.

**Alternative Hypothesis (H<sub>a</sub>):** Economies of scale are existing in the sub-sectors of Indian Textile Industry and textile industry as a whole.

## 7. METHODOLOGY

### 7.1. DATA SOURCES

The data relating to the two key variables i.e., Net Sales and Net Profit, used for the analysis of economics of scale has been garnered from the annual reports of the select companies. Apart from this, additional information relating to economies of scale and operating conditions of Indian textile industry has been acquired from various journals, magazines and text books related to the research area.

**7.2. PERIOD OF THE STUDY**

The empirical analysis made in the present study is based on the cross-sectional data relating to net sales and net profit of 173 companies for the year ending march,2013.

**7.3. SAMPLING FRAME WORK****SAMPLE DESIGN**

Textile Industry	Available companies	Companies Selected
Textiles- General	25	20
Textiles- Hosiery/Knitwear	20	20
Textiles- Manmade	22	20
Textiles- Readymade Apparels	24	20
Textiles-composite mill & Cotton Blended	14	12
Textiles-Processing	23	21
Textiles-spinning-cotton blended	61	22
Textiles-spinning-Synthetic Blended	19	18
Textiles-Weaving & Wollen/worsted	25	20
Textile-machinery	7	0
Textile-synthetic/silk	6	0
Textile-terry towels	2	0
Textile-denim	4	0
<b>Total Companies</b>	<b>252</b>	<b>173</b>

The above table charts out the sample design of the study. The total number of companies listed on stock market in the India, as per the available data, is 252. In each sub-sector, some companies are avoided due to non-availability of data. The last four categories i.e, textile-machinery, textile synthetic/silk, textile-terry towels and textile-denim are also excluded due to the presence of a very few firm in those sub-sectors.

**7.4. STATISTICAL TOOLS APPLIED IN THE STUDY**

Descriptive statistics like mean, standard deviation, coefficient of variation, kurtosis, skewness have been calculated for the net sales, net profit and net profit ratio of selected firms in textile industry. Rank Correlation, Pearson Correlation, and Kendall's tau-b correlation. Kruskal-Wallis Test has been applied to analyze the difference in Net profit ratio across the select sub-sectors of the textile industry

**8. RESULTS & DISCUSSION****8.1. DESCRIPTIVE STATISTICS FOR SIZE AND RETURNS FORM THE ENTIRE SAMPLES**

As shown in Table 1, the mean value of net sales is Rs.667.13 crores, with a standard deviation of Rs.1811.51 crores. The mean value of net profit is Rs.9.31 crores, with a standard deviation of Rs. 98.2 crores. Net profit has very high coefficient of variation compared to that of net sales which indicates the presence of large amount of variance in net profit ratio. Net sales and net profit have a positive skewness, which represents the large number of low values in the distribution. Kurtosis of net sales and net profit is more than 3, which indicates that the values in the distribution near to their mean value. The mean value of net profit ratio is 39.38%, with a standard deviation of 710.75%. From the selected textile industry, the tenth percentile and ninetieth percentile value of net sales is 4.86 and 1493.02 respectively. In tenth and ninetieth percentile, the net profit is -33.38 and 51.30 respectively.

**8.2. CORRELATION AMONG THE NET SALES AND NET PROFIT FROM THE TEXTILE INDUSTRY**

As delineated in table 2, Pearson's correlation reports strong association between net sale and net profit, whereas spearman's rank correlation and Kendall's tau-b reveals moderation correlation between the two variables. Comparatively correlation coefficient under Kendall's tau-b is very low.

**8.3. DESCRIPTIVE STATISTICS OF NET SALES, NET PROFIT AND NET PROFIT RATIO FOR SUB-SECTORS IN TEXTILE INDUSTRY**

As presented in table 3, the coefficient of variation among the various subsectors in textile industries, the net sales in weaving & woolen/worsted is maximum at 274% and minimum at 91% in spinning cotton blended textile industry and for the rest of the subsectors the coefficients of variation in net sales are fluctuating. Maximum Coefficient of variation of net profit in spinning cotton blended industry is 972.7. The minimum coefficient of net profit in composite mill& cotton blended is -2894.7, which shows negative coefficient of variation in net profit. Compare to the other textile sub sector few industries have negative coefficient of variation in net profit. The maximum coefficient of variation in net profit ratio is 601.74 in hosiery/knit textile industry; the minimum coefficient of variation in net profit ratio is -7875.48 in spinning cotton blended industry. Net sales of all the subsectors in textile industries have positive skewness, which represents the large number of low values in the distribution. Net profit of hosiery, composite mill & cotton blended, processing, spinning cotton blended and spinning synthetic blended have negative skewness, which represents the large number of high values in the distribution. Reaming textile industries net profit has positive skewness which represents the large number of low values in the distribution. All the sub-sectors except, spinning synthetic blended sales and composite mill& cotton blended, the kurtosis of the distributions of net sales, net profit and net profit-to-sales ratio, is more than three which brings to light the leptokurtic distribution of the data series.

Hosiery/Knitwear industry records the lowest amount of net sales and spinning cotton blended industry reports the highest amount, of net sales in the first quartile of the distribution of net sales of all firms in the concerned sub-groups. In third quartile, the lowest amount of net sales is reported by processing industry and manmade textile industry has shown the highest amount of net sales. Manmade textile industry records the lowest amount of net profit and spinning cotton blended industry reports the highest amount of net profit in the first quarter of the distribution of net profit of all firms in the concerned sub-groups. In third quartile, the lowest amount of net profit is reported by processing industry and general textile industry has shown the highest amount of net profit. Hosiery and Knitwear industry records lowest amount of net profit ratio and spinning synthetic blended industry reports highest amount of net profit ratio in the first quarter of the distribution of net profit ratio of all firms in the concerned sub-groups. In third quartile, lowest amount of net profit ratio are reported by processing industry and composite mill. Cotton blended textile industry has shown the highest amount of net profit ratio.

**8.4. CORRELATION BETWEEN NET SALES AND NET PROFIT**

Table 4 Pearson correlation between net sales and net profit in general textile industry, manmade, processing & weaving woolen textile industry is strong. There is a moderate correlation between net sale and net profit across the readymade apparels, spinning synthetic textile industry. There is a weak correlation between hosiery, composite mill & cotton blended and spinning cotton blended textile industry. Kendal correlation between net sales and net profit is strong in the spinning cotton blended textile industry. There is a moderate correlation between net sales and net profit in General, readymade apparels and processing textile industries. There is a weak correlation between net sales and net profit in hosiery, manmade, composite mill & cotton blended, spinning synthetic blended and weaving & woolen industries. Spearman's rank correlation between net sales and net profit is moderate among the general, manmade, readymade apparels, processing and spinning synthetic blended industries. There is a weak rank correlation between net sales and net profit among the industries like hosiery, composite mill & cotton blended, spinning cotton blended and weaving woolen industries. From the observation of all correlation between net sales and net profit there is a weak correlation in the hosiery, composite mill & cotton blended and spinning cotton blended industries.

**8.5. ANALYSIS OF VARIANCE (ANOVA) ON NET PROFIT RATIO ACROSS THE SUB-SECTORS OF TEXTILE INDUSTRY**

Analysis of variance in net profit ratio of the firms within the sub-sectors and across the sub-sectors, has been made by applying Univariate version of Analysis of Variance (ANOVA) model. ANOVA model requires the homogeneity of variance within each group of sample and so, homogeneity of variance of net profit ratio in each sub-sector of textile industry has been analyzed by using Levene's test of Homogeneity. Table 5 shows the results of Levene's test of Homogeneity of Variance. The results of the test reveals that variance in net profit ratio of the firms across the sub-sectors is not equal( $p < 0.01$ ). As one of the prerequisite of

ANOVA model is violated by the sample data, instead of using ANOVA, Kruskal-Wallis test is applied to examine the variance of net profit ratio of the firms across the sub-sectors of the textile industry. The results of the analysis are presented in table 6. Kruskal Wallis test, being a non-parametric test, is fairly robust to the violation of the assumption of homogeneity of variance of the populations. The results of Kruskal-Wallis test disclose that the distribution of net profit ratio is the same across the sub-sectors of the textile industry.

**9. FINAL FINDINGS**

The study points out that firms in 10<sup>th</sup> percentile exhibits losses which manifests that out of the total sample of the firms, 10% of the firms are in losses. The skewness of the distribution of the both net sales and net profit is positive which highlights the presence of large number of low values in the distribution. Positive value of skewness of the distribution of net sales is more than that of net profit. It signifies that firms having lower value of net sales are more than the firms having lower value of net profit. It unearths an interesting finding that some firms in the industry are able to record higher level of net profits inspite of generating lower level of net sales. It can be attributable to the operating efficiency of those firms.

The correlation between net sales and net profit across the select firms in the textile industry, has been performed by using three different facets of correlation tests i.e., Pearson’s correlation, spearman’s correlation and Kendall’s tau-b correlation. As the relationship between net sales and net profit is nonlinear in nature, Kendall’s tau-b is a legitimate measure of correlation to assess the economies of scale experienced by the firms. Kendall’s tau-b demonstrates comparatively lower level of correlation between net sales and net profit. It signifies that the presence of economies of scale cannot be affirmed based on the results of the analysis. Sub-sector wise analysis of correlation between net sales and net profit unfolds that General, readymade apparels, manmade textiles, textile processing industry and spinning-synthetic blended industry only are showing significant correlation. But, the correlation in all the sub-sectors is not strong. However, General groups of the firms are showing comparatively higher level of correlation.

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**APPENDIX**

**TABLE 1: DESCRIPTIVE STATISTICS FOR OVERALL SAMPLE**

Variable	N	Range	10th percentile	90th percentile	Mean	Std. Deviation	Coefficient of Variance	Skewness	Kurtosis
net sales(in crores)	173	19917.70	4.86	1493.02	667.1262	1811.51253	271.54	7.972	77.854
net profit(in crores)	173	1328.78	-33.38	51.30	9.3117	98.19546	1054.54	4.504	46.727
Net Profit Ratio	173	11725.24	-13.88	10.72	39.3801	710.74948	1804.84	10.784	140.52
Valid N (list wise)	173								

Source: Authors’ Calculations

**TABLE 2: CORRELATION FOR OVERALL SAMPLE**

	Pearson Correlation	Kendall’s tau-b correlation	Spearman’s Rank correlation
Correlation between Net sales& Net profit	0.762	0.327	0.427
‘p’ value	<0.001	<0.001	<0.001
N	173	173	173

Source: Authors’ Calculations

TABLE 3: DESCRIPTIVE STATISTICS FOR SUB-SECTORS IN TEXTILE INDUSTRY

Sub sectors in Textile Industry	Variable	N	Range	Quartiles Q1	Quartiles Q3	Mean	Std. Deviation	Coefficient of Variance	Skewness	Kurtosis
General	Net Sales	20	3194.00	16.77	700.23	613.297	987.385	160.1	2.018	3.213
	Net Profit	20	304.06	-0.23	27.32	18.5065	59.356	320.73	.915	3.731
	Net Profit Ratio	20	126.45	-1.37	5.91	-2.7598	27.257	-987.64	-2.517	7.186
Hosiery/ Knitwear	Net Sales	20	1960.97	3.92	502.84	286.7655	501.330	174.82	2.411	6.141
	Net Profit	20	396.66	-0.53	2.88	-15.2210	80.461	-528.62	-3.112	11.424
	Net Profit Ratio	20	873.37	-8.79	7.56	27.7942	167.250	601.74	4.113	18.071
Manmade	Net Sales	20	9752.41	54.22	1231.80	1204.322	2335.475	193.92	3.002	9.808
	Net Profit	20	565.01	-6.93	21.89	31.9160	115.0931	360.61	2.515	7.570
	Net Profit Ratio	20	8871.93	-1.66	4.34	439.9648	1978.424	449.68	4.472	19.999
Ready made Apparels	Net Sales	20	1492.97	13.43	442.21	285.0810	402.680	141.25	1.911	3.394
	Net Profit	20	224.41	-0.76	11.05	8.8595	44.793	505.59	.134	3.745
	Net Profit Ratio	20	2892.97	-6.17	6.75	-144.633	644.009	-445.27	-4.468	19.975
composite mill & Cotton Blended	Net Sales	12	1267.68	43.93	356.05	310.7700	369.584	118.93	1.948	3.745
	Net Profit	12	124.93	-1.66	11.46	-1.0658	30.852	-2894.7	-2.092	6.353
	Net Profit Ratio	12	148.30	-0.76	19.17	24.7963	52.813	212.99	1.993	2.504
Processing	Net Sales	21	1742.60	25.98	324.45	243.3257	409.153	168.15	2.842	9.059
	Net Profit	21	432.74	0.11	2.61	-16.0162	90.230	-563.37	-4.536	20.708
	Net Profit Ratio	21	45.44	0.40	3.68	1.5958	7.730	484.4	-7.80	7.305
spinning-cotton blended	Net Sales	22	3022.03	397.76	767.96	701.2686	637.828	90.95	3.648	15.033
	Net Profit	22	211.05	4.42	24.18	4.5736	44.488	972.7	-2.929	9.646
	Net Profit Ratio	22	59.42	0.69	5.32	-0.1550	12.207	-7875.48	-3.890	16.634
spinning-Synthetic Blended	Net Sales	18	2900.62	148.75	582.38	610.5867	845.929	138.54	1.965	3.056
	Net Profit	18	207.56	0.82	19.96	6.4661	42.910	663.62	-2.381	8.264
	Net Profit Ratio	18	132.31	1.10	7.58	4.7012	25.793	548.65	1.961	8.433
Weaving & Wollen/ worsted	Net Sales	20	19914.67	50.09	1041.31	1618.299	4435.161	274.06	4.083	17.414
	Net Profit	20	1032.80	-0.03	4.45	43.0910	214.033	496.7	3.981	16.882
	Net Profit Ratio	20	54.35	-0.09	5.28	-0.3425	11.015	-3216.06	-3.178	12.066

Source: Authors' Calculations

TABLE 4: CORRELATIONS FOR SUB-SECTORS IN TEXTILE INDUSTRY

			General	Hosiery/ Knitwear	Man made	Readymade Apparels	composite mill & Cotton Blended	Processing	spinning-cotton blended	spinning-Synthetic Blended	Weaving & Wollen/ worsted
Correlation between Net Sales & Net Profit	r <sub>p</sub>	Statistic	0.788	-0.173	0.864	0.362	-0.593	0.811	0.272	0.459	0.939
		'p' value	<0.001	0.465	<0.001	0.117	0.042	<0.001	0.221	0.055	<0.001
	r <sub>s</sub>	Statistic	0.606	0.224	0.463	0.508	-0.245	0.548	0.101	0.554	0.129
		'p' value	0.005	0.342	0.40	0.22	0.443	0.010	0.654	0.017	0.587
	r <sub>k</sub>	Statistic	0.516	0.221	0.326	0.417	-0.212	0.463	0.091	0.373	0.116
		'p' value	<0.001	0.173	0.044	0.010	0.337	0.003	0.554	0.031	0.475

Source: Authors' Calculations

TABLE 5: TEST OF HOMOGENEITY OF VARIANCES

Levene's Statistic	df1	df2	Sig.
3.709	8	164	0.001

Source: Authors' Calculations

TABLE 6: KRUSKAL-WALLIS TEST

Particulars	Test Statistic
Chi-Squares	3.987
Degree of freedom	8
'p' value	0.858

Source: Authors' Calculations

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