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Impact of Labour, Cost of Capital, and Output on the Average Cost of Indian Textile Industry: A Trend Analysis

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Abstract- The paper determines the average cost function in linear form to examine the cost structure of the textile sector. According to the research, the base level of cost when all other elements are held constant is indicated by the intercept of the linear average cost function, which has a positive value of 0.089 crore and is statistically significant. The average cost and output are found to be significantly inversely correlated by the research, with an output coefficient of -2.53. This indicates that the industry's economies of scale are highlighted, with an increase in output of one unit leading to a 2.53 unit decrease in average cost. The average cost is also significantly influenced by labour and capital costs. The labour cost has a statistically significant coefficient of 0.0061, whereas the capital cost has a statistically significant coefficient of 0.01598. These coefficients demonstrate how the costs of the textile sector are sensitive to variations in input prices, showing that rises in labour and capital prices result in higher average costs. The strong goodness of fit of the model is demonstrated by an R-square value of 0.914 and a significant F statistic. This high R-square value indicates that differences in labour, capital, and production may account for 91.4% of the variation in the average cost of textiles. Additional research examines the connections among labour cost, capital cost, and production by examining the average cost of the industry. With the goal of helping industry stakeholders maximise production efficiency and cost control, the findings offer a thorough understanding of how these variables interact to affect the textile sector's entire cost structure.

Keywords- Labour productivity, Indian textile industry, manufacturing, employment, exports

I. INTRODUCTION

India's textiles sector is one of the oldest industries in the Indian economy, dating back to several centuries. India's textile industry remains mainly strong due to its strong production base of various fibers and yarns, ranging from natural materials like cotton, jute, silk, and wool to synthetic materials like polyester, viscose, nylon, and acrylic. India ranks

third worldwide in terms of textile and apparel exports. One of the pillars of the Indian economy is the textile and apparel sector. In 2021–2022, handicrafts and textiles and apparel (T&A) accounted for a substantial 10.5% of India's total goods exports. 4.6% of the world's textile and clothing commerce is with India. India ranks among the world's top producers of jute and cotton. Additionally, 95% of the hand- woven fabric produced worldwide is produced in India, which

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ranks as the world's second-largest producer of silk. there has been a surge in investment in the textile It is anticipated that total textile exports will reach \$65 billion by FY26 and increase at a 10% CAGR from 2019 to 2026, when they will reach \$190 billion.

The government of India has introduced the Production Linked Incentive (PLI) Scheme, with an approved outlay of INR 10,683 crore, to stimulate the manufacture of MMF Apparel, MMF Fabrics, and Technical Textile Products in the country, allowing the textile industry to grow and scale and become competitive. Under its Rs. 10,683 crore production-linked incentive (PLI) scheme for the labour-intensive textile and apparel sector, the textile ministry has chosen 61 companies, to get benefits. Under the programme, the corporations have committed to investing Rs 19,077 crore over a five-year period. This will result in an additional turnover of US\$ 22.55 billion and the creation of 240,000 direct jobs.

The government's main objective has been on developing manufacturing textile through best-in-class manufacturing establishing the infrastructure, upgrading technology to foster innovation, enhancing skills and traditional strengths in the textile sector, and so on, all in line with the goal of making India's development inclusive and participative.

Export Destinations for Textiles: India exports textile products to over a hundred countries. India exported textiles of value around USD 10,468 million (29%) to USA, making it the largest export destination for textiles followed by EU-27 USD 7,670 million (21%) and Bangladesh USD 2,533 million (7%) during 2022-2023.

Import Sources for Textiles: About 50% of India's textiles import is Fibre and Yarn used for the value addition. China (38%), Bangladesh (12%), United States (8%), Vietnam (5%) and Australia (4%) are top import sources for textile in India.

Investment: From April 2000 to December 2023, the textile industry received \$4.43 billion in foreign direct investment (FDI). Over the past five years,

industry. With the goal of encouraging and sustaining Indian handicrafts, the Reliance Foundation opened the first "Swadesh" handicrafts store in Hyderabad in November 2023.

Government Initiatives: Indian government has come up with several export promotion policies for the textiles sector. It has also allowed 100% FDI in the sector under the automatic route. The

Rs. 10,683 crore PLI scheme is expected to be a major booster for the textile manufacturers. The scheme proposes to incentivise MMF (man-made fiber) Apparel, MMF Fabrics and 10 segments of Technical Textiles products.

Advantages to India Competitive Advantage

In comparison to major textile producers, India has an advantage over them in terms of skilled labour and manufacturing costs.

Policy Support

The Indian textile industry is open to 100% FDI (automatic route). The government has also established other similar programmes to support the textile industry.

Increasing Investments

Several government initiatives, like the Scheme for Integrated Textile Parks (SITP), have been created in an effort to increase employment and draw in private equity (PE).

Robust Demand

The demand for textiles will be driven by rising income levels, favourable demographics, and increased organised retail penetration. By 2030, the market for Indian clothing and textiles is expected to expand at a 10% compound annual growth rate, or US\$ 350 billion.

Furthermore, the Indian technical textile market is the fifth largest in the world, with a 10% growth rate and an improved penetration level of 9-10%. In 2022-2023 the sportech industry in India is projected to be worth US\$ 1.17 million.

The drape and gown market for medical textiles in India is estimated to be worth US\$ 9.71 million in 2022 and is projected to increase at a 15% annual rate to reach US\$ 22.45 million by 2027.

With a compound annual growth rate (CAGR) of 16.3% from 2021 to 2026, the Indian composites market is projected to reach a value of US\$ 1.9 billion. By 2027, the country will consume 7,68,200 tonnes of composite materials.

Encouraged by robust export and domestic demand, the Indian textile sector has a bright future ahead of it. The retail industry has grown rapidly in the last ten years due to an increase in consumerism and disposable money, and the arrival of major foreign companies into the Indian market. Higher disposable income is the outcome of strong economic growth. Due to the increase in product demand, there is now a sizable domestic market.

II. LITERATURE REVIEW

Vanita Ahlawat and Renu, 2018 "An Analysis of and Association Growth Between Labour Productivity and Wages in Indian Textile Industry" examines the relationship between wages and labour productivity in the Indian textile sector. The study emphasizes how important the textile industry is to jobs in India. The writers assess employment, man-days worked, earnings, and the industry's net value added (NVA) in addition to the industry's workforce growth and composition. The study also highlights the important role labour productivity plays in setting textile workers' pay scales.

Pankaj Dixit and Lal R.C., 2019 "A Critical Analysis of Indian Textile Industry: An Insight into Inclusive Growth and Social Responsibility" examines the social responsibilities and the contribution of the Indian textile industry to inclusive prosperity. The report highlights the sector's economic and cultural significance, especially in terms of job creation. However, it notes that due to the industry's unorganized nature, its contributions to social responsibility are lacking.

Darshan Kumar, Jagdev Singh and Om Pal Singh, 2011 "Analysis of Distribution System of Supply Chain and Relationships Between Manufacturer and Customers for Indian Textile Industry" Assesses the significance of supply chain management plays in the Indian textile industry's overall value generation. To improve performance and value generation, the paper highlights the importance of strong manufacturer- customer connections and effective distribution networks. It also offers insightful information about the opportunities and problems facing the supply chain of the Indian textile sector.

Rahul Dhiman and Manoj Sharma, 2019 "Relation Between Labour Productivity and Export Competitiveness of Indian Textile Industry: Co-Integration and Causality Approach" The study reveals the long-term link between the select factors for the Indian textile sector by using the Johansen and Juselius test to examine the cointegration between select variables.

According to the study, there is neither short-term nor long-term causal relationship between the independent and dependent variables. It also suggests that textile companies apply the productivity-based salaries approach.

Vaishali Agarwal, Ramanpreet Kaur, Debdeep De, 2019, "Scenario Analysis of Textile Industry in Asia-Pacific Trade Agreement (Apta)" This study demonstrates the evolution of the export and import shares of a few selected economies under the Asia-Pacific Trade Agreement (APTA) and presents a scenario analysis with the goal of growing the textile sector. The study also highlights important areas of improvement that India can concentrate on to enhance the textile industry's trading situation, and how the APTA could offer guidance in this respect.

T.A. Bhavani and Suresh D. Tendulkar, 2010 "Determinants of Firm-Level Export Performance: A Case Study of Indian Textile Garments And Apparel Industry" in their study examines the factors that influence the export performance function, or the percentage of exports in output, and the export Ashita Katiyar. International Journal of Science, Engineering and Technology, 2024, 12:3

choice function, or whether to sell domestically or Cost Function export. These tasks are estimated for Delhi's garment and apparel manufacturing facilities. One important factor influencing both functions turns out to be the structure of the corporate organization, (Tendulkar, 2010) which reflects capital availability.

III. RESEARCH METHODOLOGY

This study is based on time series secondary data. The time period considered in the study is 2009-2010 to 2018-2019. Time series secondary data has been collected for output, labour employed, capital formation and total cost of Textile Industry of India.

The data has been collected from the following sources:

- Indian Brand Equity Foundation (IBEF) •
- Annual reports of Ministry of Textile
- **EPW Research Foundation**

Objective of Study

- To analyze the growth trends of Indian Textile Industry.
- To estimate the cost function of textile industry.
- To estimate the relationship of labour price, capital price, Output with Average cost.

Plan of Study

Hypothesis

Following are the hypothesis to be tested in this study:

- Null hypothesis (H0): Levels of output, price of labour and price of capital do not have significant impact on cost of Textile Industry of India.
- Alternative hypothesis (H1): Levels of output, price of labour and price of capital have significant impact on cost of Textile Industry of India.

Econometric Model

Following is the econometric modeling considered in the study:

With the help of cost function, we will see the impact of output, price of labor and price of capital on total cost and average cost. For this, we use linear equations.

Linear equation-
$$TC=a + bO + cP + dPc$$

AC= $a + bO + cP + dPc$

Where,

TC- total cost, AC- average cost, O-output, P-price of labor, Pc- price of capital, a, b, c and d are constants to be estimated.

In all the above econometric models, Ordinary Least Square method will be used for the estimation purpose. The estimation will be done using E-views.

Analysis of Variables Used

In this project, we use variables like output, labour, capital, price of labour, price of capital, total cost, average cost and time.

Output (O)

It is the value of gross output of Textile Industry measured in crore. Output here is taken as dependent variable in trend analysis and production function whereas in cost function it is considered as independent variable.

Price of Labour (P)

It is calculated by dividing total emoluments by number of workers engaged. It is considered as independent variable in cost function.

Price of Capital (Pc)

It is measured by dividing interest paid by gross capital formation. It is considered as independent variable in cost function.

Average Cost (AC)

It is calculated by dividing total cost by output. It is considered as dependent variable in cost function.

Time is considered as independent variable in trend analysis.

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Data set

Following table shows the data for average cost, output, price of labour and price of capital of Textile Industry of India for years 1999-2000 to 2018-19. Data has been taken from EPWRF.

Т	able 1:	Estimation	of average	ge cost fun	ction
				J (u_

S.No	Years	Averag Cost(AC	Output (O)	Price o labour (Price o capital (Pc)
1	2009 - 2010	0.0986630 8	215977.7 5	9.47188745	0.32095 48
2	2010 - 2011	0.0847560 35	295179.1	11.089255	0.21069 668
3	2011 - 2012	0.0969252 83	315800.4 7	12.3537775	0.84594 523
4	2012 - 2013	0.0962383 39	342994.4 9	13.7638463	0.53857 096
5	2013 - 2014	0.0929097 64	408999.1	15.6487741	0.58104 815
6	2014 - 2015	0.1056364 69	415337.7 2	17.1082705	1.02979 924
7	2015 - 2016	0.1110519 25	416241.7 7	18.6073271	0.53398 737
8	2016 - 2017	0.1138500 92	439481.8 6	19.9180187	0.74198 266
9	2017 - 2018	0.1162652 17	466300.5 1	21.3205624	0.60813 81
10	2018 - 2019	0.1081976 86	490987.5 8	22.8425153	0.53670 433

Regression St				
Multiple R	0.95638468			
R Square	0.91467165			
Adjusted R Square	0.87200748			
Standard Error	0.00362802			
Observations	<u>10</u>			

	Coefficient	Stand and Error	T state	p-value
Intercept	0.08920088	0.00649463	13.734543	9.26208E-
	5	8	74	06
output(o)	-2.53961E-	6.17803E-	-	0.006281
	07	08	4.1107187	293
Price of	0.00619485	0.00113410	5.4623108	0.001569
labour (P)	1	8	27	172
Price of	0.01598173	0.00589200	2.7124437	0.034992
Capital (Pc)	7	7	6	247

F statistic - 21.43886943

Significant at 5 % level of significance

IV. RESEARCH FINDING

Table 1, shows the estimate of textile average cost function in linear form. According to the linear average cost function, the value of intercept is statistically significant with a positive value 0.089 crore. Here the output coefficient is -2.53, which is statistically significant, showing that if output is increased by one unit, its average cost will be decreased by 2.53 units. In the case of price of labour the coefficient is 0.0061 which is statistically significant and in the case of price of capital the value of coefficient is 0.01598 and it is also statistically significant.

In linear form the goodness of fit is also statistically significant as shown by the value of F statistic. The value of R-square is 0.914 which shows that the variation in Textile average cost being explained by output, price of labour and price of capital is 91.4%.

V. CONCLUSION

This report is based on the time series analysis of various variables of Indian Textile Industry. In this we used data related to output, labour, capital, price of labour, price of capital, total cost and average cost of Textile Industry of India. In this we have seen the growth analysis using trends, production function and cost function for both total cost and average cost. We have estimated the regression equations for these functions using Eviews.

In trend analysis we have used the linear models for output, labour and capital. Trend equation shows that the result is statistically significant which means that In cost function, levels of output, price of labour and price of capital have significant impact on average cost. As output increases total cost also increases while average cost decreases.

REFERENCES

 India, G. o., n.d. EPWRF India Time series. [Online] Available at: https://epwrfits.in [Accessed 2 May 2024]. Anon., n.d. [Online]. Ashita Katiyar. International Journal of Science, Engineering and Technology, 2024, 12:3

- Renu, V. A. &., 2018. An Analysis of Growth and Association between Labour Productivity and Wages in Indian Textile Industry. Sage Journals, 43(1-2).
- Tendulkar, T. B. &. S. D., 2010. Determinants of firm-level export performance: a case study of Indian textile garments and apparel industry. The Journal of International Trade & Economic Development, 10(1), pp. 65-92.
- Vaishali Agarwal, R. K. &. D. D., 2017. Scenario Analysis of Textile Industry in Asia-Pacific Trade Agreement (APTA). Sciencedirect, Volume 122, pp. 685-690. Sharma, R. D. &. M., 2019. Relation between Labour Productivity and Export Competitiveness of Indian Textile Industry: Cointegration and Causality Approach. Research gate, pp. 22-30.
- Darshan Kumar, J. S. &. O. P. S., 2011. Analysis of distribution system of supply chain and relationships between manufacturer and customers for Indian textile industry. Research gate, 3(1), pp. 66-85.
- R.C, P. D. &. L., 2019. A Critical Analysis of Indian Textile Industry: An Insight into Inclusive Growth And Social Responsibility. Research gate, pp. 53-61. India, G. o., 2023. Ministry of Textile. [Online] Available at: https://texmin.nic.in [Accessed 3 June 2024].
- 7. India, G. o., 2023. Invest India. [Online] Available at:

https://www.investindia.gov.in/sector/textilesapparel#:~:text=India%20is%20among%20the %20world's,trade%20in%20textiles%20and%20 apparel. [Accessed 15 June 2024].

 India, G. o., 2023. IBEF. [Online]Available at: https://www.ibef.org/industry/textiles [Accessed 3 June 2024].