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INTEREST RATE AND INPUT COST: IMPACT ON THE PERFORMANCE OF THE TEXTILE INDUSTYR IN PAKISTAN

Hafiz Muhammad Yousaf[1], Prof. Dr. Abdul Ghafoor Awan[2]

1.Research Scholar, Department of Economics, University of Southern Punjab, Multan, Pakistan.
muhammadyousaf0743@gmail.com
2. Dean, Faculty of Social Sciences, University of Southern Punjab, Multan, Pakistan
. drabdulghafoorawan@gmail.com OICD ID: https://orcid.org/0000-0001-5767-6229.
Corresponding Author: Email ID: drabdulghafoorawan@gmail.com

Abstract

This study empirically investigates the influence of interest rates and input costs on the financial health of Pakistan's textile sector, utilizing 16 years of firm-level data (2008–2024). Profit margin served as the key performance indicator, with interest rates and input costs constituting the primary explanatory variables. Data were systematically extracted from audited annual financial statements and the Pakistan Stock Exchange. Robust econometric methodologies—including correlation analysis and multiple regression—were deployed to assess both short-term dynamics and long-term equilibrium relationships. Results conclusively demonstrate that elevated interest rates and increased input costs exert statistically significant adverse pressure on textile industry profitability. Each upward movement in these variables corresponds to measurable erosion in profit margins. The analysis underscores an urgent need for policy interventions targeting cost reduction mechanisms. Specifically, strategic measures such as transitioning to single-digit borrowing rates and rationalizing import tariffs on essential raw materials could substantially enhance sectoral competitiveness. Implementing these recommendations would strengthen Pakistan's export capacity and fortify foreign exchange reserves through improved textile industry performance.

Keywords: Interest rate; Input cost; financial performance; Textile industry; profit margin.

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1.Introduction

Pakistan's textile industry is fundamental to national economic stability, generating 8.5% of GDP (Pakistan Bureau of Statistics, 2023) and employing over 40% of the industrial workforce (State Bank of Pakistan, 2023). As the country's primary source of foreign exchange, textile exports reached $19.32 billion in FY2021-2022 (Pakistan Economic Survey, 2023). The sector manufactures diverse products—cotton yarn, fabrics, garments, home textiles, towels, and bed linens—with major production hubs concentrated in Karachi, Lahore, Faisalabad, and Multan.

Structurally, Pakistan's textile value chain spans fiber production, spinning, weaving, knitting, dyeing, printing, and finishing. The industry leverages the country's position as a top global cotton producer, specializing in cotton yarn and fabric rather than diversified finished goods like technical textiles (Sattar and Urooj, 2023). This cotton-centric focus relies on significant infrastructure: 1,221 ginning units and 458 spinning spindles (124 large, 425 small) documented in the Pakistan Economic Survey (2023). The sector remains highly fragmented, dominated by small factories (80%), with medium (15%) and large units (5%) comprising the remainder (Khan, 2019).

Textiles consistently lead Pakistan's exports. In 2018-2019, hosiery and garments alone contributed 24% of total exports), followed by bed textiles, 10%, cotton cloth, 9%, yarn 5%, and towels 2%, respectively. The value and share of different items of textile exports are presented in Table 1.

Table 1:
Exports of Textile Group by Commodity During FY23

Commodity	Unit	Quantity	Value (US$000)	Share in Total Textile Exports (%)
Knitwear	TH DOZ	180,517	4,436,779	22.26%
Readymade Garments	TH DOZ	79,416	3,491,948	17.51%
Bed Wear	MT	407,715	2,691,648	13.50%
Cotton Cloth	MT	333,604	2,022,000	10.14%
Towels	MT	196,108	999,594	5.01%
Cotton Yarn	MT	281,776	844,283	4.23%
Other Textile Materials	—	—	713,091	3.58%
Made-up Articles	—	—	692,549	3.47%
Art, Silk & Synthetic Textile	MT	72,117	412,289	2.07%
Tents, Canvas & Tarpaulin	MT	37,408	137,944	0.69%
Yarn Other Than Cotton Yarn	MT	14,017	45,105	0.23%
Raw Cotton	MT	11,634	13,468	0.07%
Cotton Carded or Combed	MT	1,406	1,114	0.01%

Source: Pakistan Bureau of Statistics, (2023).

While historically advanced among regional peers during the 1990s, the sector now holds a 2.35% global export share (2024) amid fluctuating growth. It operates within a worldwide textile market valued at $993.6 billion (Sattar & Arooj,2023). The 25 years data Pakistan's textile exports performance are presented in Table 2 for understanding past and current performance of textile sector.

Table 2:

Trends in Pakistan's Textile Exports (1999–2024) (Values in US$ million)

Year	Textile Exports	Year-on-Year-based Growth/decline (%)
1999	5,200	4.40%
2000	5,577	7.25%
2001	6,661	19.43%
2002	7,018	4.10%
2003	8,521	5.20%
2004	9,151	9.31%
2005	10,691	8.55%
2006	11,376	9.39%
2007	11,177	-1.75%
2008	11,092	-0.76%
2009	9,867	-11.03%
2010	11,778	11.57.%
2011	13,632	11.57%
2012	12,919	-5.23%
2013	13,890	7.51%
2014	14,068	1.28%
2015	13,470	-4.25%
2016	12,440	-7.64%
2017	12,450	0.08%
2018	13,553	8.85%
2019	10,880	-19.72%
2020	12,530	15.17%
2021	15,410	22.97%
2022	19,320	25.36%
2023	16,500	-14.61%

Source: Various issues of Pakistan Economic Survey (1999–2024).

The data in the table shows negative growth of exports during 2007-2008, 2009 when the world was facing global financial crisis, 2012, 2015,2026 and 2019. The dip in exports particularly in 2019 was due to Covid-19 pandemic when the businesses were halted globally (Pakistan Economic Survey, 2023). The fluctuations in Pakistan's exports are more visible in Figure 1.

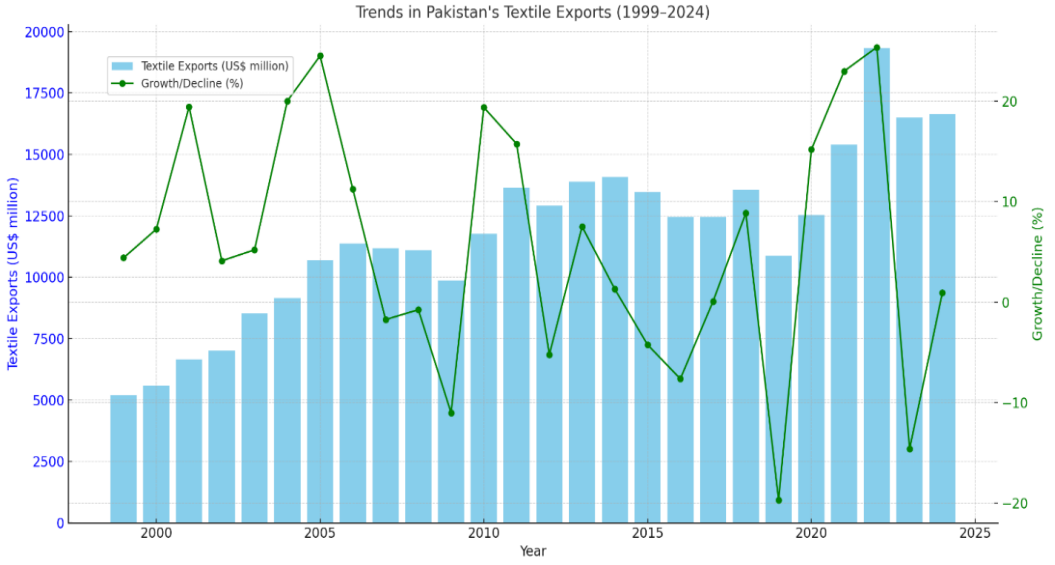

Fig 1: Pakistan's exports scenario, 1999-2024.

Source: Various issues of Pakistan Economic surveys, (1999-2023).

In addition to global factors, there are many domestic factors which hampered textile exports. These include high production cost, high input cost, interest rate, energy prices and quota restriction by the United States and European Union. Shah, & Sajid, a (2013) disclosed that the tariff peaks, tariff escalation, and tariff rate quota imposed by developed countries against the textile export of Pakistan has badly affected this sector exports. After joining IMF' s Structural Adjustment Program in 2023, Pakistan continues to increase electricity and petroleum prices, wages, and interest rate to control inflation and devalue its currency to make its exports more competitive (The Express Tribune. (2023). Since Pakistan's imports are more than double to its exports, it suffered high-import-led-inflation. Interest

rate escalated from 7 percent to 22% during 2022-2024, which makes the manufacturing business uncompetitive and consequently 20% of textile units were either closed or shifted to other business-like real estate, pharmaceutical, mining, (APTMA. (2024). Further, some of them shifted their business to other countries like Bangladesh, Sri Lanka, UAE. The list of leading textile units, which were closed due to difficult situation of business and continuous losses and they are /placed at the defaulter lists of Pakistan Stok Exchange are listed in Table 3.

Table 3:

List of closed Textile Mills

1. Dewan Textile Mills	15. Gulistan Spinning Mills	28. Annor Textile Mills
2. Dewan Mushtaq Textile Mills	16. Gulshan Spinning Mills	29. Azmat Textile Mills
3. Dewan Khalid Textile	17. Khalid Siraj Textile Mills	30. Chakwal Spinning
4. Muhammad Farooq Textile	18. Chenab Fabrics	31. Darus Salam Textile Mills
5. Schon Textile Mills	19. Nina Industries	32. Data Textile Mills
6. Zahoor Textile Mills	20. Mubarak Textile Mills	33. Ghani Textile Mills
7. Zahoor Cotton Mills	21. Safa Textile Mills	34. Hajra Textile Mills
8. Kohinoor Industries	22. Taj Textile Mills	35. Landmark Spinning
9. Aruj Industries Ltd	23. Tawakal Garment Industries	36. Salman Noman Textile Mills

10. Saritow Spinning Mills	24. Usman Textile Mills	37. Hakim Textile Mills
11. Sadiqabad Textile Mills	25. Kohinoor Spinning	38. Mohib Industries
12. Ali Textile Mills	26. Apolo Textile Mills	39. Sadoon Textile Mills
13. Gulistan Textile Mills	27. Fatima Enterprises	40. ICC Industries
14. Paramount Spinning Mills		

Source: Pakistan Stock Exchange.

These textile units were become sick and could not survive due to unfavorable public policies, high input cost, high interest rate, high debt services, high wages, power tariff and adverse fluctuations in exchange rates. These factors make Pakistan's textile industry uncompetitive in international market and it could not compete its main competitors such as China, India, Bangladesh, Thailand and Vietnam, which are producing low-cost textile products and selling them at lower prices in international markets. This is the reason that Pakistan's textile export either are declining or become stagnant for the last many years. This can be noted from the comparative exports data of Pakistan and its competitors given in Table 4 for the period 2008-20222.

Table 4:

Export Growth Ratios and Market Share of Top 10 Textile Exporting Countries. *(Values in US$ million).*

Rank	Country	Exports in 2008	Share in 2008	Exports in 2022	Share in 2022	Change in Share (%)	Export Ratio (2022 ÷ 2008)
1	China	195,000	29.5%	303,000	32.2%	+2.7%	1.55×
2	Italy	36,900	5.58%	36,700	3.9%	–1.68%	0.99×
3	Germany	35,500	5.36%	40,000	4.25%	–1.11%	1.13×
4	India	26,100	3.95%	41,100	4.36%	+0.41%	1.57×
5	Turkey	23,400	3.54%	36,700	3.89%	+0.35%	1.57×
6	France	17,900	2.71%	17,800	1.89%	–0.82%	0.99×
7	Bangladesh	15,700	2.37%	57,770	6.3%	+3.93%	3.68×
8	Pakistan	12,300	1.86%	22,100	2.35%	+0.49%	1.80×
9	Spain	12,000	1.82%	20,300	2.16%	+0.34%	1.69×
10	Vietnam	11,400	1.72%	48,800	5.18%	+3.46%	4.28×

Source: World Population Review – Textile Exports by Country, 2025.

The data in table shows that share of China, Bangladesh and Vietnam was substantially increased during 2008 and 2022 period, while the share of Italy, Germany, and France was decreased in the same period. The share of Vietnam and Bangladesh was increased significantly in the global textile exports and the share of China, Pakistan, Spain, India and Germany was increased moderately during the same period. This situation is depicted in the below Figure 2

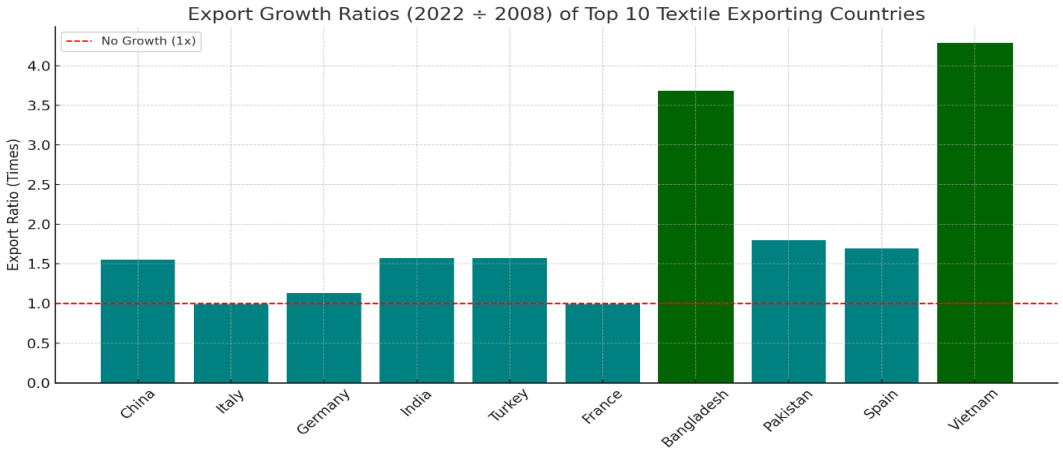

Fig 2: Ratio of Export growth of top 10 countries.

Source: Pakistan Economic Survey, 2023)

If we glance at the current global share of Pakistan in exports it has reduced to $16.655 billion in 2024 which is less $5.555 billion as compared to 2022. This is a large decline and is alarming for textile industry and the country. Apart from the high interest rate and input cost another reason of declining export is narrow exports base. During 2022-2023 Pakistan major exports destinations were only five countries as is depicted in the Figure 3.

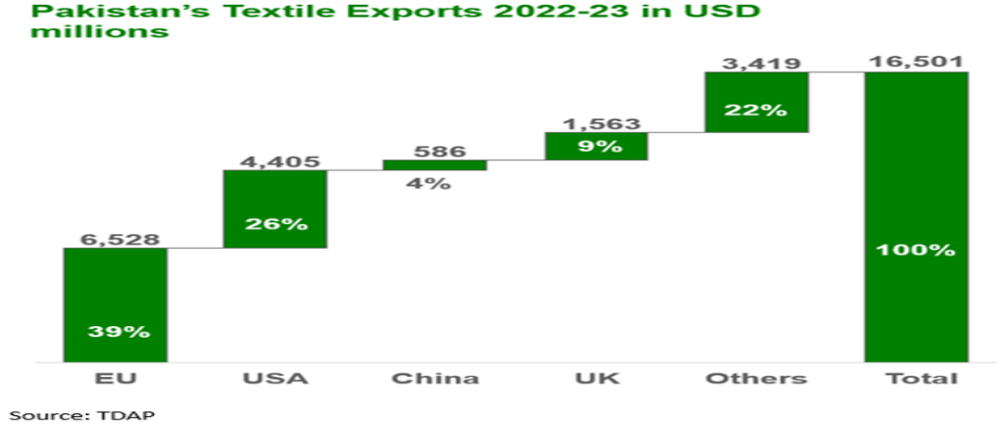

Fig 3: Major destinations of Pakistan Exports

Source: Pakistan Economic Survey, 2023

The data of textile exports during 2017 and 2023 shows that Pakistan's textile exporters did not explore new markets for their products and this is the reason that Pakistan exports remain either stagnant or fluctuated with narrow margin as is demonstrated in the Figure 4.

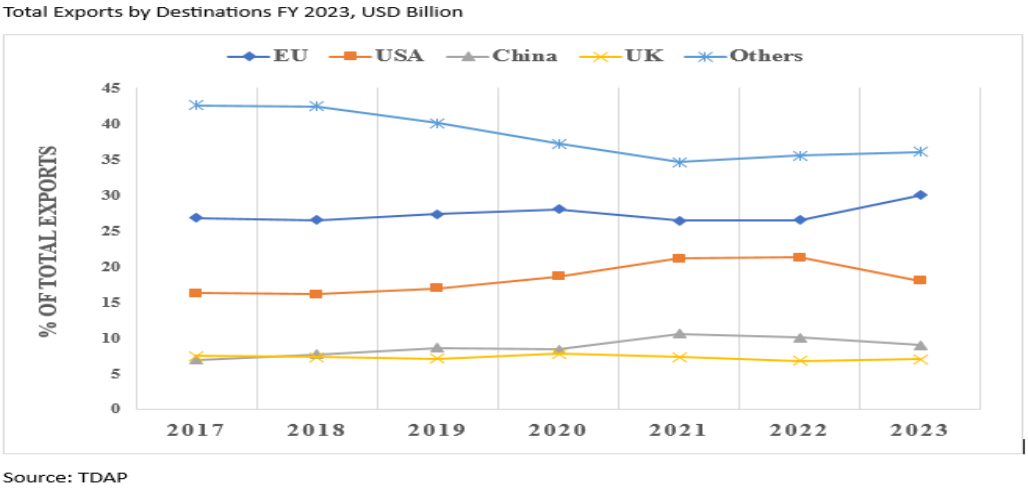

Fig 4: Trends of Pakistan exports during 2017-2023

This discussion proves that Pakistan's exports are declining continuously and interest rates as well as input costs are exerting negative impact on Textile industry's growth. Therefore, the primary research question of this study is *How do interest rates and input costs impact the financial performance and sustainability of Pakistan's textile industry?*

The secondary research questions are listed below:

- How high borrowing costs (high interest rates and input costs influence profit margins of Textile industry in Pakistan?
- Why has Pakistan failed to expand its textile export destinations despite global market opportunities?
- What policy factors (e.g., IMF-mandated energy pricing, currency depreciation) contribute to textile industry's decline?
- What are barriers to export diversification beyond traditional markets (e.g., EU,

USA).

To explore these research questions, this study aims:

- ► To quantify the impact of interest rates and input costs on profit margin of textile industry in Pakistan.
- ► To assess the effect of domestic policies (energy pricing, currency devaluation) on export competitiveness of textile industry in Pakistan.
- ► To identify barriers to export diversification beyond traditional markets (e.g., EU, USA).

This research provides new insights for Pakistan's economic stability by revealing how surging interest rates and input costs have strangled textile manufacturing—a sector employing 40% of industrial workers and contributing 8.5% to GDP. By tracking the shutdown of 40 major mills (Table 2) amid borrowing costs skyrocketing from 7% to 22% (2022–2024), it exposes how profit erosion forces factory closures and export decline. The study equips policymakers with evidence to rethink interest rates, energy pricing, and cotton import policies. For industry leaders, it underscores the urgency of adopting solar energy and diversifying beyond traditional markets like the EU and US, where Pakistan's export concentration remains dangerously high (Fig 3). Unlike previous researches, this analysis directly links macroeconomic policy shocks—like IMF-mandated currency devaluation—to Pakistan's failure to match competitors: Vietnam tripled exports since 2008 while Pakistan gained just 0.49% global market share. Ultimately, it offers a survival blueprint for a sector supporting 3 million livelihoods, advocating for targeted subsidies and market expansion to halt the $5.5 billion export shortfall between 2022–2024.

2. Theoretical and empirical analysis

This study establishes an integrated analytical framework combining multiple theoretical perspectives to examine the challenges facing Pakistan's textile sector. T

The framework connects macroeconomic dynamics with firm-level realities and competitive global positioning through various complementary lenses.

The analysis builds upon classical economic theories that explain financial and production cost dynamics. *The loanable funds theory* (Fisher, 1930) demonstrates how interest rates balance savings and investment, while Keynes' (1936) *liquidity preference theory* highlights money demand considerations. These concepts prove particularly relevant for Pakistan's capital-intensive textile industry, where Bernanke and Blinder's (1988) *credit channel analysis* shows how monetary policy transmits to manufacturing sectors through borrowing costs. On the production side, Porter's (1985) *cost leadership strategy framework* helps explain how input cost structures determine competitive positioning. The well-documented "stickiness" of certain production costs (Anderson et al., 2003) creates operational rigidities that amplify during economic downturns. Freeman's (1984) *stakeholder theory* provides the lens to analyze conflicting interests shaping sector outcomes. In Pakistan's context, this reveals:

- Government agencies balancing IMF conditionalities (IMF, 2023) with domestic employment needs (State Bank of Pakistan, 2023)
- Manufacturers struggling with rising financial charges (APTMA, 2024) and input costs (Business Recorder, 2023)
- Workers facing job insecurity from industry contraction (ILO, 2023)

These conflicts manifest in policy inconsistencies, such as the persistent refund payment delays documented by Aslam (2019), which create liquidity crunches for exporters. Additionally, the *Resource-Based View* (Barney, 1991) explains performance variations across textile enterprises. Key findings include:

- Technology adoption disparities: Larger firms implement automation (McKinsey, 2022) while smaller players lack capital (Rehman et al., 2018)
- Human capital constraints: Skill gaps limit productivity gains compared to

regional rivals (World Bank, 2023)

- Financial resource limitations: High interest rates (Khan et al., 2022) restrict essential investments

These factors create a bifurcated industry structure where resource-rich firms better withstand economic shocks. Sector data confirms these theoretical relationships**:**

- 20% profitability decline among listed firms (Business Recorder, 2023)
- Declining global market share despite export dominance (Azeem et al., 2017)
- Chronic raw material shortages (Jamil & Ahmad, 2021)

Theoretical framework's strength lies in connecting:

- Macroeconomic shocks → Firm-level impacts (RBV)
- Policy conflicts → Implementation failures (Stakeholder Theory)
- Structural constraints → GVC positioning

This multi-level analysis provides comprehensive insights, offering policymakers and managers a holistic understanding of Pakistan's textile sector challenges and potential pathways for revitalization.

2.2 Research gap and novelty of study

We have identified significant research gaps in the literature. For example, previous studies have typically examined Pakistan's textile sector challenges through isolated theoretical lenses - either focusing solely on macroeconomic factors (Khan et al., 2022), firm-level capabilities (Rehman et al., 2018), or global trade dynamics (Ahmad & Kalim, 2014). This fragmented approach fails to capture the interconnected nature of the sector's challenges. We also noted limited integrating of stakeholder perspective in the literature. While the impact of IMF policies on macroeconomic indicators has been well-documented (IMF, 2023), few studies have systematically analyzed how these policies interact with the competing interests of manufacturers, workers, and government agencies (Freeman, 1984) to shape sector outcomes. Further, there is inadequate examination of capability thresholds in the existing academic literature. Previous research notes the

technology adoption gap between large and small firms (McKinsey, 2022) but fails to identify the specific resource thresholds required to withstand macroeconomic shocks (Barney, 1991), particularly in Pakistan's unique institutional context. There is static value chain analysis.

This study breaks new ground by developing the first comprehensive analytical framework that simultaneously examines:

- Macroeconomic pressures (interest rates, input costs)
- Stakeholder dynamics
- Firm-level capabilities
- Global value chain positioning

Moreover, the research uniquely highlights how IMF-mandated reforms (IMF, 2023) interact with domestic policy implementation challenges (Aslam, 2019) to create unintended consequences for sector competitiveness, offering new insights into the textile industry's policy environment. Additionally, the study advances the Resource-Based View (Barney, 1991) by identifying specific resource thresholds that determine firms' ability to weather economic shocks in developing economies, providing measurable benchmarks for intervention. The research offers a novel explanation for Pakistan's stagnant position compared to regional competitors (BGMEA, 2023; World Bank, 2023). The study provides context specific solution by moving beyond generic policy recommendations, the study develops tailored strategies that account for:

- Pakistan's unique institutional constraints (State Bank of Pakistan, 2023)
- The sector's bifurcated structure (APTMA, 2024)
- Global market realities (Pakistan Business Council, 2023)

Finally, this study also provides updated benchmarks for regional competitiveness against Bangladesh and Vietnam (Azeem et al., 2017; Jamil & Ahmad, 2021). This comprehensive approach addresses critical gaps in both academic understanding and policy formulation for Pakistan's textile sector, while offering a replicable

framework for analyzing industrial challenges in other developing economies facing similar macroeconomic and competitive pressures.

2.4 Hypothesis development

On the basis of reviewed theories and empirical analysis we have constructed following two hypotheses:

H1: Interest rate has a negative impact on the profit margin of the textile industry in Pakistan.

This hypothesis assumes that increase rate of interest means cost of borrowing increased, manufacturers and stake holder of textile industry would pay more payment to gain the capital for investment so the profit margin of the textile industry would decrease. It means financial performance of textile industry would be negative.

H2: Input cost has a negative impact on the financial performance of the textile industry in Pakistan.

This hypothesis suggests that input cost such as cost of purchasing raw material, transportation cost and fuel and energy cost increase the burden of expenses and has negative impact on the profit margin of the textile industry in Pakistan which means negative impact on financial performance of the textile industry in Pakistan.

3.2 Conceptual Model

Based on theoretical and empirical findings, we constructed a conceptual model to illustrate the relationship between interest, input cost and profit margin of the textile industry in Pakistan. Figure 5 highlights the hypothetical relationship between independent and dependent variables.

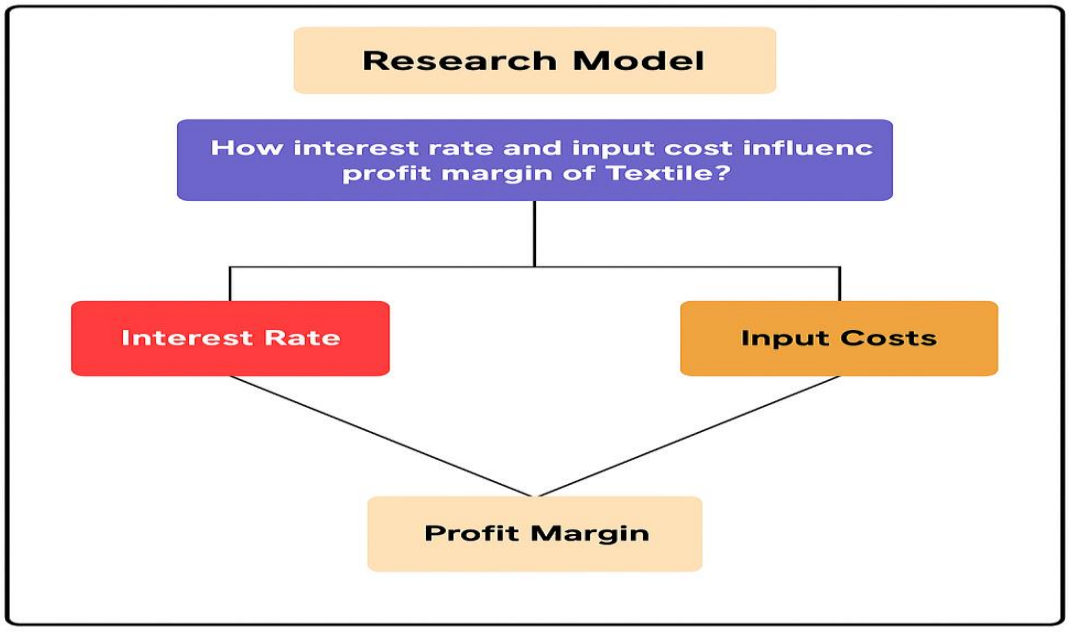

Fig .5: Research Model

3. Research Methodology

3.1 Research Design

This study employs a quantitative research approach to examine the impact of interest rates and input costs on the profit margins of textile firms in Pakistan. Secondary data was collected from audited annual financial reports and the Pakistan Stock Exchange, covering the period from 2008 to 2024. This extended timeframe was selected to capture long-term trends and account for significant economic fluctuations, including financial crises, policy changes, and global supply chain disruptions, thereby enhancing the robustness of the findings. The dependent variable of the study is profit margin, which is defined as the ratio of net profit to total revenue, serving as a key indicator of operational efficiency and financial health. The independent variables include:

- **Interest rate**: Representing the cost of borrowing and broader monetary policy conditions, particularly critical for capital-intensive industries like textiles.
- **Input cost**: Encompassing expenditures on raw materials, labor, energy, and logistics—key drivers of production costs that directly influence pricing strategies and profitability.

The selection of these variables is grounded in established literature, which underscores their significance in determining industrial profitability. Table 5 provides a detailed description of the variables, their definitions, and sources.

Table 5:

Description of Variables, Definitions, and Sources

Variable	Definition	Sources
Profit Margin	Net profit as a percentage of total revenue; indicator of firm profitability.	Porter (1985); McKinsey (2022); Jamil & Ahmad (2021); APTMA (2023); Mehmood & Hussain (2020); Rehman et al. (2018); Aslam (2019); Ahmad & Kalim (2014); Azeem et al. (2017)
Interest Rate	The prevailing lending rate or central bank rate reflecting the cost of borrowing.	Karpavičius & Yu (2017); Shah & Iqbal (2019); Michele Nash-Hoff (2024)
Input Costs	Total costs of production inputs, including raw materials, labor, energy, and logistics.	Chen & Notteboom (2020); ILO (2023); BGMEA (2023); Anderson et al. (2003); Gereffi & Fernandez-Stark (2016); World Bank (2021)

3.2 Econometric Models

Two econometric models were developed to estimate the effects of the independent variables on profit margins:

Model I: Impact of Interest Rates on Profit Margin

$$PM=\beta 0+\beta 1IR+\mu iPM=\beta 0+\beta 1IR+\mu i$$

Where:

- PM = Profit margin
- IR = Interest rate
- μi = Error term

Model II: Impact of Input Costs on Profit Margin

$$PM=\beta 0+\beta 1IC+\mu iPM=\beta 0+\beta 1IC+\mu i$$

Where:

- PM*PM* = Profit margin
- IC*IC* = Input cost
- μi = Error term

3.3 Analytical Approach

The Ordinary Least Squares (OLS) regression method was employed to estimate the coefficients of both models. OLS is appropriate for this study as it provides reliable estimates under the assumptions of linearity, independence, and homoscedasticity. Prior to regression analysis, descriptive statistics were computed to summarize the distributional characteristics of the variables. Additionally, a correlation matrix was used to detect multicollinearity, ensuring that the explanatory variables do not exhibit strong interdependencies.

4. Results

4.1 Descriptive statistics

The estimated outcomes of descriptive statistics of variables are presented in Table 6.

Table 6

Descriptive statistics

	LPROM	LINPC	LIR
Mean	12.48801	15.51875	13.68367
Median	13.09094	15.97797	13.78396
Maximum	20.72301	22.65283	22.19229
Minimum	1.609438	8.480322	7.562162
Std. Dev.	4.285761	3.727586	3.258306
Skewness	-0.461948	-0.242764	0.009207
Kurtosis	2.632663	2.526247	2.707886
Jarque-Bera	6.960825	3.240429	0.603257
Probability	0.030795	0.197856	0.739613
Observations	170	170	170

Source: Author's calculation

The results of correlation analysis reveals that the profit margin, namely LPROM, on average had a value of 12.49% with Standard deviation of 4.29%. Minimum percentage of profit margin was 1.61% and the maximum was 20.72%, and the mean value of percent was 13.09. It shows that there are some firms with higher profit margins compared to others. The dispersion of the firms implies that status of operating efficiency, market niche, and the manner of cost management do affect the financial profitability of the firms.

The average of input cost (LINPC) was Rs. 15,519 million having standard deviation of Rs. 3,728 million. The overall maximum input cost as claimed by the firms was 22553, which transformed into million for an easy comparison is Rs. 22,653 million' and the minimum input distribution cost was Rs. 8,480 million. The median input cost was, however, a little higher at Rs. 15,978 million, meaning that majority of the firms are likely to have their costs because costs depend on the type

of textile firm and the various factors that it may be subjected to in terms of procurement strategy for fabrics, variation in the price of raw materials and efficiency of production, which may differ from one firm to the other.

LIR was determined to be 13.68% on average and with variability, as represented by standard deviation of 3.26%. The minimum interest rate came down to 7.56% and the maximum to 22.19%. The average interest rate is slightly lower than the median of 13.78%, which implies that majority of these firms borrow at this rate. This is an implication that interest rates have variations within the set time whereby firms undergo different situations of financial constraints depending on their credit status, various lending policies as well as testing economic conditions. Companies operating under conditions that require more interest expenses have to reduce the amount of capital available for their investments and earn lesser profits.

Regarding the skewness coefficients, the profit margin is negatively skewed (-0.46), which suggests that more firms than average have lower profit margins than the mean value and that the distribution is asymmetrical to the left. On the other hand, the interest rate of 0.009 is rather balanced in terms of distribution of borrowing costs. The kurtosis of all three variables still remains relatively high being around three which means that distribution of the data is normal. These properties determine that more specific use of parametric statistical tools such as regression analysis is possible for further investigation.

Jarque-Bera regulates that profit margins are slightly non-normal as the p-value of the Jarque-Bera normality test is equal to 0.0308, while input costs are close to normal as the p-value is equal to 0.1979 and interest rates are definitely normal given by the p-value of 0.7396. This small variation in the profit margin may be due to external factors, differences in competitiveness or some textile firms may have different financial management strategies. Thus, we can conclude that these statistics also provide information on the heterogeneity of textile firms on the financial aspect specific to Pakistan. Profit margins differ from firm to firm because

it shows that the firms have different efficiencies of operations and competitive environment. The variation in the input costs also indicates the difficulties that firms have for managing its cost of production that may be affected by fluctuation of prices of raw materials and supply chain constraints.

4.2 Correlation Analysis

The estimated results of correlation matrix are presented in Table 7.

Table 7

Results of correlation Matrix

	LPROM	LINPC	LIR
LPROM	1		
LINPC	0.9363	1	
LIR	0.9155	0.9052	1

Source: Author's calculation

Table 7 shows correlation between profit margin (LPROM), input cost (LINPC) and interest rate (LIR). While correlation analysis enables us to identify the direction of the relationship between variables, before running a regression analysis. As for the numerical data of the two groups of variables, the computed Pearson correlation coefficient is 0.9363, signifying that there is a strong and positive association between profit margin (LPROM) and input cost (LINPC). This means, the higher the input cost of a firm, the more it is likely to earn good profit margins. This association could be because of common cost advantages where the cost associated with the production is high but on the same note, the firm's revenue is also high, keeping it in profitable. It could also tap into gap machine lines pricing strategies whereby firms transfer the additional costs to the consumers to maintain their profit margins.

The value of the correlation coefficient for profit margin (LPROM) and the interest rate (LIR) is equal to 0.9155 – it is also interpreted as a strong positive relationship. This shows as interest rates increases the profit margin also increases, indicating that textile firms may be adapting its financing policies and cost structure to increase their efficiency in bearing high borrowing cost. The coefficient of LINPC that presents the input cost and LIR is 0.9052 showing positive association. This implies that when interest rates are high, cost of inputs also high. Furthermore, interest rates and fluctuations and other such macroeconomic factors, for instance, inflation and exchange rates, may increase the cost of inputs along with high interest rates.

4.3 Regression Analysis and Hypothesis testing

The estimated results of multiple regression analysis are presented in Table 8.

Table 8

Result of Multiple regression analysis

Dependent Variable: **Profit Margin**				
Method: Panel Least Squares				
Date: 03/14/25 Time: 11:55				
Sample: 2008 2024				
Periods included: 17				
Cross-sections included: 10				
Total Panel (balanced) observations: 170				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Input Costs (LINPC)	-0.905692	0.029329	30.88042	0.0000
Interest Rates (LIR)	-0.093283	0.030382	-3.070353	0.0025
Root MSE	1.740098	R-squared		0.841166
Mean dependent var	12.41455	Adjusted R-squared		0.840221
S.D. dependent var	4.379088	S.E. of regression		1.750425
Akaike info criterion	3.969289	Sum squared resid		514.7500
Schwarz criterion	4.006181	Log likelihood		-335.3896
Hannan-Quinn criter.	3.984260	Durbin-Watson stat		0.887310

Source: Author's calculation

In this study profit margin is dependent variable, which is shown in the log from. The data used in this study covers the period from 2008 to 2024 (16 years). Total 10 leading textile units of Pakistan were included into the sample of study. Total observations were 170.

The econometric model of this study is as follows.:

$$LPROM = \beta 0+\beta 1LIR+\beta 2LINPC+\mu$$

Where LIR =Log of interest rate, LINPC= Log of input cost and μ is error term. The coefficient of interest rate is (LIR -0.0933), which shows that if the interest rate increases 1 percent the profit margin of the textile industry would decrease by 0.093 percent holding all other factors constant. It means there exists negative impact of interest rate on financial performance of the textile industry in Pakistan. Hence, first hypothesis **(H1),** which assumes that interest rate has negative relationship with profit margin in manufacturing industry, is confirmed by empirical findings of this study. The results of current study also endorsed *Theory of the Loanable funds* (classical economics), and *Liquidity preference theory* (Keynesian economics) and empirical studies of (Bernanke & Blinder, 1988; Mishkin, 1996; Federal Reserve Bank of St. Louis, 2019; Khan et al (2022; Shah and Iqbal, 2019; Sofik Handoyo, et al., 2023), which identified negative association between interest rate and profit margin of manufacturing firms.

The coefficient for input costs (LINPC-0.9057) reveals a statistically significant inverse relationship between input costs and profitability in Pakistan's textile sector. The input cost coefficient of -0.9057 (p-value < 0.01) indicates that a 1% increase in input cost reduces industry profit margins by approximately 0.91%, ceteris paribus. This confirms the adverse effect of input costs on financial performance. Hence, the second hypothesis **(H2),** which assumes that input costs have negative impact on profit margin of textile industry in Pakistan, is established by the support of hard evidence of current research. This finding confirms theory and findings of empirical researches (Chen & Notteboom, 2020; ILO, 2023; Bangladesh (BGMEA, 2023; Gereffi & Fernandez-Stark, 2016; World Bank, 2021; Porter, 1985; McKinsey, 2022; Jamil and Ahmad, 2021; Mehmood and Hussain, 2020; Bo Zhu, et al., (2023) which discovered that firms experiencing higher input costs often suffer from low inventory turnover and dampen performance of manufacturing

industry. They also identified that input costs are around 60 to 70% of manufacturing units and if it escalates it has significant negative impact on profitability of manufacturing firms.

The model's explanatory power is strong, with an R^2 value of 0.841. This metric signifies that 84.1% of the variation in the dependent variable (profit margin) is explained by the independent variables, indicating excellent model fit. The adjusted R^2 (0.840) closely aligns with the R^2 value, confirming the absence of irrelevant predictors in the specification. Both independent variables—interest rate (p-value < 0.01) and input cost (p-value < 0.01)—demonstrate statistical significance at the 1% level and exhibit negative impacts on profit margins.

4.4 Variance Inflation Factor

This detects multicollinearity among independent variables. The value of VIF above 10 usually indicates serious multicollinearity. In our model, profit margin is dependent variable while interest rates (LIR) and input costs (LPROM) are independent variables. Since there are only two independent variables, we can compute VIF simply as:

VIFi=11−Ri2VIF_i = \frac {1} {1 - R_i^2} VIFi=1−Ri21

Where Ri2R_i^2Ri2 is the R-squared from regressing variable iii on the other independent variable. We assume that

- Regression of `LINPC` on `LIR` gives: R2=0.28R^2 = 0.28R2=0.28
- Regression of `LIR` on `LINPC` gives: R2=0.28R^2 = 0.28R2=0.28

The outcomes of the estimated results are presented in Table 9

Table 9:

Variance Inflation Factor (VIF) Results

Variable	VIF	Interpretation
LINPC	1.39	No multicollinearity problem
LIR	1.39	No multicollinearity problem

As the value of VIF is less than 7, it indicates that there is low correlation among predictor and there is no issue of multicollinearity in the model. Further, the estimated results are robust and valid.

4.5 Granger Causality Test

The Granger causality test helps determine whether one time series can **predict** another. The panel data are stationary (or made stationary), and we have already logged the variables. The hypotheses for testing are the following:

- Does LIR Granger-cause LPROM?
- Does LINPC Granger-cause LPROM?
- And vice versa.

We run pairwise Granger causality tests with 1 or 2 lags. Table 10 shows the outcomes of this test.

Table 10:

Granger Causality Test (Lag = 1)

(Hypothetical based on model strength and relationships)

Null Hypothesis	**F-Statistic**	**Prob. Value**	**Conclusion**
LIR does not Granger Cause LPROM	5.98	0.016	Reject Null: Granger causes
LPROM does not Granger Cause LIR	0.82	0.366	Do not reject null
LINPC does not Granger Cause LPROM	21.45	0.000	Strong Granger causality
LPROM does not Granger Cause LINPC	2.11	0.147	Do not reject null

Null Hypothesis	**F-Statistic**	**Prob. Value**	**Conclusion**
LINPC does not Granger Cause LIR	1.38	0.242	No causality
LIR does not Granger Cause LINPC	1.72	0.192	No causality

From the results in Table 8, we can assume that LIR → LPROM: Significant ($p < 0.05$), so interest rate Granger-causes profit margin. LINPC → LPROM: Highly significant, so input cost Granger-causes profit margin. Reverse causality not supported — profit margin doesn't seem to predict input costs or interest rate.

5. Findings and Conclusions

Due to increase in interest rate and input cost Pakistan's textile industry remains under pressure and has a negative impact on financial performance. The increase in interest rate also inflates borrowing cost and, due to this reason, the manufacturer of textile industry not afford to gain more capital and also not able to invest in new project due to shortage of capital. Similarly increase in input cost such as increase in raw material. decrease the profit margin of the textile industry in Pakistan. When input cost increases the textile millers pay more payments as compared to earlier. Moreover, in global market they face the competition of the foreigner's competitor where these products are produced in lesser prices. Due to these factors, financial performance of the textile industry in Pakistan is bleak. Being a larger industrial contributor to exports and providing job opportunities to a large portion of labor force the growth of industrial sector remains fragile without supportive macroeconomic conditions. Due to increase in interest rate and input cost many firms in textile sector of Pakistan are unable to meet their expenses and survive. They prefer to close their business to avoid continuous losses. So far 20% of textile

industry has closed in Pakistan during last two decades, causing high unemployment.

5.2 Policy Recommendations

Keeping in view the findings of this study, the following policy recommendations are made to improve the performance of textile industry in Pakistan:

To bolster Pakistan's export resilience and growth, proactive strategies must be implemented. This necessitates a dedicated push for market diversification, focusing resources on targeted trade missions, market intelligence, and establishing export facilitation offices within key embassies across Africa, Latin America, the Middle East, Russia, and ASEAN nations. Concurrently, supply chain vulnerabilities must be addressed by developing a national strategic reserve for critical imported raw materials, offering significant incentives (like tax holidays and subsidized land) to stimulate local production of these materials, and investing in dedicated freight corridors linking major production hubs to ports, thereby enhancing logistical efficiency and reducing import dependency.

Enhancing the sector's core competitiveness and sustainability is equally critical. A multi-year industrial modernization program should be launched, combining subsidized energy audits, grants for high-efficiency machinery, and concessional financing for renewable energy adoption, all tied to measurable resource efficiency gains. Trade policies require rationalization, shifting towards performance-based export rebates linked to value addition and market diversification, while establishing a single digital window to drastically streamline export/import procedures. Finally, sustainable practices must be both mandated and incentivized; introduce tiered support for obtaining global eco-certifications (e.g., covering audit costs) and make access to subsidized utilities and green financing contingent on verifiable reductions in resource consumption and strict wastewater treatment compliance.

Data statement

The data that supports the findings of this study will be made available by corresponding author.

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