

IMPACT OF COST STRUCTURES ON PROFITABILITY: INSIGHTS FROM A PANEL STUDY

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ABSTRACT

Cost management constitutes an essential element in attaining and maintaining organizational profitability. Understanding the cost structure is essential for effective cost management, as it enables organizations to identify cost drivers, control expenses, and enhance profitability. The purpose of the study is to demonstrate the impact of cost structure on profitability using panel data from the pharmaceutical industry of an emerging country. This quantitative study examined the relationship between costs and profitability using secondary data from the annual reports of 31 companies. The unbalanced panel dataset comprised 180 firm-years. To assess causality, three regression models (Robust OLS, Random Effects, and Fixed Effects) were applied using STATA. The results from the Fixed Effects Model reveal that five out of six variables—Cost of Goods Sold (CGS), Administrative Expenses (ADME), Selling, Marketing, and Distribution Expenses (SMDE), Finance Cost (FINC), and Contribution to Workers' Profit Participation Fund (WPPF)—exert a statistically significant influence on profitability. In contrast, Tax Expense does not demonstrate a significant effect. The model estimates suggest that a one-unit increase in CGS is associated with a 0.9764-unit decrease in profitability. Similarly, a one-unit increase in ADME, SMDE, FINC, and WPPF reduces profitability by 1.0146, 0.9705, 0.8664, and 1.6035 units, respectively. However, the results from the Pooled OLS regression offer an intriguing observation: the WPPF appears to have a positive, albeit statistically insignificant, relationship with profitability. These findings are valuable for managerial decision-making, as they highlight key cost components that should be prioritized for control and reduction to enhance overall profitability.

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INTRODUCTION

Cost management is a critical factor in achieving and sustaining organizational profitability, as it allows firms to allocate resources efficiently and minimize superfluous expenses (Kulshrestha, 2022). Through rigorous cost monitoring and control, organizations can boost operational effectiveness and strengthen their market competitiveness. Furthermore, sound cost management facilitates informed strategic decision-making by delivering precise financial data that aligns with long-term profitability objectives. Cost management encompasses the systematic planning, regulation, and oversight of expenditures to optimize operational efficiency and ensure long-term financial sustainability (Thapayom, 2021). Understanding the cost structure is essential for effective cost management, as it enables organizations to identify cost drivers, control expenses, and enhance profitability (Al-Rikabi & Sahib, 2022).

In today's competitive environment, companies are feeling the urge to control and decrease costs to increase profitability (Simons, 2019). To control costs effectively, it is essential to understand the cost structure. A clear understanding of the cost structure empowers managers to make better decisions, such as optimizing pricing and budgeting. To establish competitive pricing while maintaining profitability, it is crucial to minimize costs without compromising product or service quality (Kharub et al., 2019). In light of this, this study aims to provide a clear understanding of the effects of cost structure on profitability, enabling managers to take effective cost-control measures.

Several studies have focused on the impacts of one or two specific costs on profitability. For example, Krasniqi et al. (2021) investigated salary, interest, and provisions expenses, Milán et al. (2014) studied material cost, Suzan and Khotimah (2023) focused on operational and production costs, Kisyeri (2022) examined administration costs, Rahman et al. (2020) studied advertising cost, Hurley and Touran (2002) examined overhead, and Vržina and Dimitrijević (2020) investigated tax cost. However, there is a limited number of studies examining the impact of the entire cost structure

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(treating all expense categories as independent variables) on profitability. To gain a clear understanding of this relationship, it is essential to analyse the overall cost structure and its impact on profitability. Therefore, this study will consider all costs and their effects on profitability.

The objective of the study is to demonstrate the impact of cost structure on profitability using panel data from the pharmaceutical industry of an emerging country.

The significance of the study lies in its potential to provide managers with a clear understanding of which costs to prioritize for control and minimization in order to enhance profitability.

The remaining sections of this study are organized as follows: Section 2 includes the literature review, Section 3 shows the research methodology, Section 4 indicates the findings and discussion, and Section 5 concludes the study.

LITERATURE REVIEW

Effective cost management entails more than simple expense reduction; it involves strategic resource allocation, operational efficiency, and prudent investments in quality. Research demonstrates the distinct influence of specific cost categories—including administrative, marketing, and production expenditures—on manufacturing profitability (Dawood, 2024). Understanding the cost structure is essential for effective cost management, as it enables organizations to identify cost drivers, control expenses, and enhance profitability.

Cost structure represents the various expenses a firm incurs to operate its business, and analyzing these costs helps improve profitability and build a sustainable business model (Singh, 2019; Fitriasari, 2020). In manufacturing firms, this structure includes production costs, administrative expenses, selling and distribution expenses, research and development, finance costs, and taxes (Hilton & Platt, 2005).

Profitability reflects a firm's ability to generate income relative to expenses, indicating operational efficiency and influencing business value (Hirdinis, 2019). It is evaluated through metrics such as gross profit, operating profit, net profit, return on assets, and return on equity (Kuster et al., 2023; Lim & Rokhim, 2021).

Costs of Goods Sold impact a firm's profitability

A firm's cost of goods sold (COGS) is a primary determinant of its gross margin and, consequently, its overall profitability. Contemporary research indicates that both the magnitude and the dynamic behavior of COGS are significant. Empirical evidence from multinational studies reveals that COGS, alongside other operating expenses, can exhibit "asymmetric" or "sticky" characteristics; specifically, these costs decrease at a slower rate during sales contractions than they increase during sales expansions. This asymmetry erodes profit margins and diminishes profitability, with the degree of this effect contingent upon factors such as national context and firm size (Naoum et al., 2024; Naoum et al., 2023). Furthermore, a firm's capacity to pass increases in input costs through to consumers via higher prices is critical for preserving profitability. Survey-based analyses demonstrate that such cost-price passthrough, while substantial, is frequently incomplete across firms. Consequently, profitability is squeezed in scenarios where the growth rate of COGS outpaces that of output prices (Kogan et al., 2023; Lavoie, 2024). Complementary analysis on markups suggests that aggregate price-cost margins remained largely stable in the post-pandemic period, despite increases within certain sectors. This implies that recent fluctuations in profitability are predominantly attributable to underlying cost dynamics, including COGS, rather than to a broad-based expansion of markups (Leduc et al., 2024). In summary, the prevailing scholarly consensus posits that effective management of COGS levels, the mitigation of cost stickiness, and the strategic exercise of pricing power are fundamental mechanisms for sustaining corporate profitability (Ibrahim et al., 2022).

H1: Costs of Goods Sold impact a firm's profitability.

Administrative Expenses impact a firm's profitability.

Scholarly work indicates that the impact of administrative expenses on profitability is multifaceted. These costs now constitute a primary operational outlay for many firms; however, a declining correlation with concurrent revenues has rendered profit margins a less reliable performance indicator without efficient allocation toward value creation (Srivastava, 2023). Disaggregated analysis reveals that components like wage-based intangible costs show no consistent relationship with future Return on Assets (ROA), unlike sales and marketing expenditures, highlighting the critical importance of compositional efficiency over aggregate spending (Chen et al., 2024). Furthermore, the well-documented phenomenon of cost stickiness—where administrative costs adjust downward more slowly than sales—adversely affects margins and ROA during economic contractions (Abdullah, 2021; Ibrahim et al., 2022). This detrimental effect can be exacerbated by macroeconomic shocks, such as policy uncertainty, leading to further profit erosion (Xia et al., 2025).

H2: Administrative Expenses impact a firm's profitability.

Selling, Marketing, and Distribution Expenses impact a firm's profitability.

Emerging research indicates that expenditures related to "selling, marketing, and distribution" exert a complex influence on firm profitability. Markovitch et al. (2020), utilizing direct firm-level expenditure data rather than proxies, demonstrate that increased marketing intensity is generally associated with elevated profit margins and enhanced expectations of future earnings. Conversely, components of Selling, General, and Administrative (SG&A) costs can exhibit "stickiness," a tendency exacerbated by policy uncertainty; for instance, IPO suspensions in China have been shown to increase the asymmetry of SG&A cost adjustments, potentially compressing profit margins during sales downturns (Xia et al., 2025).

In a related finding, shocks that increase labor costs—a principal element of SG&A—correlate with diminished productivity and firm performance (Xia et al., 2024). Within distribution channels, research on dual-channel supply chains reveals that decisions concerning sustainability and pricing strategies reallocate marketing and logistics expenses across the network. In this context, coordinated strategies, such as cost-sharing arrangements, are found to enhance the chain's aggregate profit potential (Taleizadeh et al., 2025). Collectively, these findings suggest that strategic marketing investment supports profitability, whereas unmanaged SG&A rigidity and inefficiencies within distribution channels can have a detrimental effect.

H3: Selling, Marketing, and Distribution Expenses impact a firm's profitability.

Finance Costs impact a firm's profitability.

The profitability of firms is generally suppressed by higher finance costs, which arise primarily from interest on debt. These costs elevate the interest burden and crowd out capital that could otherwise be allocated to investment or efficiency gains. Recent research demonstrates that the debt-performance nexus is often characterized by a non-linear trajectory, wherein profitability increases with debt to an optimum level before decreasing as finance costs overwhelm benefits (Dsouza et al., 2025). Smaller firms experience the detrimental effect of heightened leverage most severely, as they operate under tighter credit conditions and have less negotiating power with lenders (Alabdulkarim et al., 2024). Conversely, measures that lower the cost of debt, including robust ESG performance that mitigates perceived risk, can reduce finance costs and provide support for profitability (Alves & Meneses, 2024).

H4: Finance Costs impact a firm's profitability.

Workers' Profit Participation Fund impacts a firm's profitability.

Mandatory profit-sharing, such as a Workers' Profit Participation Fund (WPPF), generally has a neutral or slightly positive effect on a company's profitability. While these programs reallocate a portion of a firm's earnings from shareholders to employees, they can improve productivity and decrease expensive employee turnover. According to Doucouliagos et al. (2020), profit sharing is consistently linked to increased productivity, which is a key component of a company's profitability. This suggests that when employees share in a company's success, they are more motivated to work efficiently. Furthermore, Makridis (2025) presents new evidence from surveys showing that profit sharing is connected to higher job satisfaction and reduced employee turnover. By retaining employees, companies can avoid the substantial costs associated with recruiting, hiring, and training new staff, thereby helping to protect their profit margins. Nimier-David et al. (2023) found that when profit sharing is legally required, it increases employee compensation, essentially redistributing wealth from shareholders. This redistribution occurs without negatively impacting a firm's investment or productivity. This suggests that even when shareholders receive a smaller share of profits, the company's operational performance remains largely unaffected.

H5: Workers' Profit Participation Fund impacts a firm's profitability.

Tax Expenses impact a firm's profitability

Higher tax expenses, both current and deferred, lower a firm's reported net income. This reduction decreases key profitability ratios, including return on assets (ROA) and return on equity (ROE). Consequently, companies reporting greater tax expenses typically exhibit lower short-term accounting profitability (Bachas et al., 2023; Rompotis, 2024). However, recent empirical research reveals more complex outcomes. Some studies indicate a positive link between specific deferred-tax metrics and firm performance, which can result from timing differences in profitable companies. In contrast, other research suggests that large deferred tax liabilities or aggressive tax strategies might indicate future risk and correlate with poorer performance (Gabrielli & Greco, 2023; Rompotis, 2024). Ultimately, broader analyses emphasize that statutory tax rates, firm-specific effective tax rates, and the design of the tax system itself significantly influence investment incentives and long-term profitability. Therefore, understanding a firm's tax expense necessitates an evaluation of its tax planning strategies, national policies, and its stage in the business lifecycle (Bachas et al., 2023).

H6: Tax Expenses impact a firm's profitability.

This study examines the effect of cost structure on profitability, emphasizing that understanding cost structure is essential for cost control and achieving profit targets (Siyabola & Raji, 2013). Prior research highlights varying impacts across industries—for example, cost structure negatively affects return on equity but positively affects book value to total assets in construction firms (Mandilas et al., 2008), while overhead costs significantly influence profitability in U.S. design firms (Hurley & Touran, 2002). Other findings show that salary, interest, and provision expenses affect bank profitability (Krasniqi et al., 2021), material costs are crucial in dairy sheep firms (Milán et al., 2014), administration costs reduce profitability in Tanzanian manufacturers (Kisyeri, 2022), and advertising efficiency and lower effective tax rates enhance profitability in U.S. pharmaceutical and agricultural firms, respectively (Rahman et al., 2020; Vržina & Dimitrijević, 2020).

Conceptual Framework

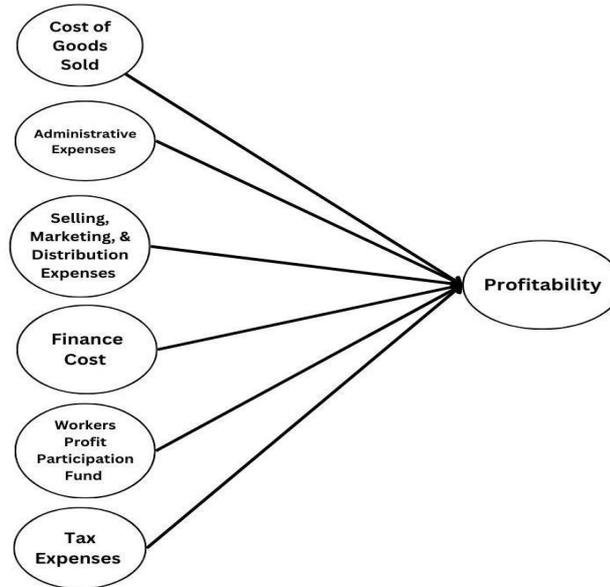


Figure 1. Conceptual Framework of the Study

MATERIALS AND METHODS

Research Design and Approach

This study adopts a quantitative research design to test hypotheses using secondary data. It investigates the causal relationships between expenses (Cost of Goods Sold, Administrative Expenses, Selling, Marketing, & Distribution Expenses, Finance Cost, Workers Profit Participation Fund, and Tax Expenses) as independent variables and profitability (Profit After Tax) as the dependent variable.

This study is grounded in a positivist approach, predicated on the belief that knowledge is objective and can be discovered through empirical evidence. The study is guided by the theory of profit maximization achieved through cost minimization (Alavipour & Arditi, 2019; Basu, 2019; Khan, 2017). To minimize costs, it is essential to understand the cost structure for effective cost control. Consequently, this study will examine the impact of cost structure on profitability.

Data Collection Methods and Instruments

Quantitative data on expenses and profitability were collected from the pharmaceutical industry of Bangladesh, an emerging economy. A total of 31 companies were comprised in the study, with data obtained from their annual reports. The resulting panel data consisted of 180 firm-years and were unbalanced. Initially, the data were collected on an Excel sheet. The ratios were then calculated within the same spreadsheet. Finally, the ratio data were used in STATA software.

Data Analysis Techniques and Procedures

For the purpose of analysis, Stata software was used. Initially, descriptive statistics were calculated to determine the mean, maximum & minimum values, and standard deviation of the variables. Then, pairwise correlations were calculated and presented in a table to assess the presence of multicollinearity.

The independent sample t-test is used to find whether there are any statistically significant variances between the means of two sets of independent variables. To conduct the independent sample t-test, the dependent variable (profitability), is categorized into two groups: Profit and Loss.

To determine the causal relationship between the dependent and independent variables, three regression models were applied: Robust Ordinary Least Squares (OLS), Random Effects Model, and Fixed Effects Model. Robust OLS was employed to address potential heteroscedasticity in the error terms within the OLS framework. Given the panel data structure, a Random Effects Model was utilized under the assumption that individual-specific effects are uncorrelated with the dependent variable. Besides, to control for unobserved heterogeneity, a Fixed Effects Model was implemented. Finally, a Hausman specification test was applied to select the most proper model between Random Effects and Fixed Effects.

The endogeneity test is conducted to determine whether any endogenous variables exist. The test results indicate that there is no endogeneity problem. Therefore, the Generalized Method of Moments (GMM) model or Dynamic Panel Data model is not applied in this study. Without the proper specification of endogenous and instrumental variables in the Dynamic Panel Data model, the estimations would be inconsistent, leading to incorrect decision-making.

The variables used in this study and their measurement methods are presented in Table 1.

Table 1. Variables and Measurement

Variable	Acronym	Measure	Definition
Dependent Variable			
Profitability Ratio	PAT	Profit After Tax / Sales	Profitability Ratio is a financial metric that measures how much net profit a company earns from its total sales
Independent Variable			
Cost of Goods Sold Ratio	CGS	Cost of Goods Sold / Sales	Cost of Goods Sold Ratio measures the proportion of sales revenue spent on producing the goods sold.
Administrative Expenses Ratio	ADME	Administrative Expenses / Sales	Administrative Expenses Ratio measures the percentage of sales revenue spent on administrative functions.
Selling, Marketing, & Distribution Expenses Ratio	SMDE	Selling, Marketing, & Distribution Expenses / Sales	Selling, Marketing, & Distribution Expenses Ratio measures the portion of sales revenue allocated to the costs of promoting, marketing, and delivering a product or service.
Finance Cost Ratio	FINC	Finance Cost / Sales	Finance Cost Ratio measures the percentage of sales revenue used to cover a company's finance costs, such as interest on loans.
Workers Profit Participation Fund Ratio	WPPF	Workers Profit Participation Fund / Sales	Workers Profit Participation Fund Ratio measures the percentage of sales revenue allocated to the Workers' Profit Participation Fund.
Tax Expenses Ratio	TAXE	Tax Expenses/Sales	Tax Expenses Ratio measures the percentage of sales revenue paid as tax expenses.

Note: For conducting the independent sample t-test, profitability, the dependent variable, is categorized into two groups: Profit and Loss.

The panel data model is presented below:

$$PAT_{it} = \beta_0 + \beta_1CGS_{it} + \beta_2ADME_{it} + \beta_3SMDE_{it} + \beta_4FINC_{it} + \beta_5WPPF_{it} + \beta_6TAXE_{it} + \epsilon_{it} \quad (1)$$

RESULTS

Descriptive Statistics

The descriptive statistics of the variables were calculated and are presented in Table 2. The table includes the mean, minimum & maximum values, and standard deviation for each variable. The mean values for PAT, CGS, ADME, SMDE, FINC, WPPF, and TAXE are 0.021, 0.665, 0.088, 0.131, 0.041, 0.007, and -0.001, respectively.

Table 2. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
PAT	180	.021	.658	-7.902	.383
CGS	180	.665	.375	.084	4.492
ADME	180	.088	.32	.006	4.266
SMDE	180	.131	.139	0	1.378
FINC	180	.041	.065	-.003	.672
WPPF	180	.007	.008	0	.083
TAXE	180	-.001	.045	-.089	.133

Pairwise Correlations

The pairwise correlation coefficient is calculated and shown in Table 3 to determine the relationship between the selected variables, although correlation does not imply causation. Table 3 indicates that PAT has a negative relationship with CGS (-0.903), ADME (-0.912), SMDE (-0.142), FINC (-0.316), and TAXE (-0.110). Conversely, PAT has a positive relationship with WPPF (0.176). It is interesting to note that the cost for WPPF has a positive correlation with profit, suggesting that contributions to the provident fund boost employee morale, thereby acting as a motivation to increase profitability. However, the pairwise correlations tables also show that there is no multicollinearity issue among the independent variables.

Table 3. Pairwise correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) PAT	1.000						
(2) CGS	-0.903*	1.000					
(3) ADME	-0.912*	0.773*	1.000				
(4) SMDE	-0.142	-0.041	-0.046	1.000			
(5) FINC	-0.316*	0.344*	0.077	0.037	1.000		
(6) WPPF	0.176*	-0.214*	-0.066	-0.085	-0.243*	1.000	
(7) TAXE	-0.110	0.173*	0.020	0.024	0.165*	0.046	1.000

* shows significance at p<0.05

Independent Sample T-Test

The independent sample t-test is used to examine whether there are any statistically significant variances between the means of two sets of independent variables (Table 4). When conducting the independent sample t-test, the dependent variable (profitability), is categorized into two groups: Profit and Loss. The result of the independent sample t-test is as follows:

Table 4. Independent Sample T-Test

	Profitability Status	Obs	Mean	Difference	T value	P value
Cost of Goods Sold / Sales	Profit	163	.6048924	-0.6398489	-7.7042	0.0000***
	Loss	17	1.244741			
Administrative Expenses/Sales	Profit	163	.0622351	-0.2762602	-3.4950	0.0006***
	Loss	17	.3384952			
Selling, Marketing, & Distribution Exp/Sales	Profit	163	.124742	-0.070132	-1.9938	0.0477**
	Loss	17	.1948741			
Finance Cost / Sales	Profit	163	.0338615	-0.0754574	-4.8450	0.0000***
	Loss	17	.109319			
WPPF/Sales	Profit	163	.0069254	.0012983	0.6692	0.5043
	Loss	17	.0056271			
Tax Expenses/Sales	Profit	163	-.0030359	-0.019292	-1.7013	0.0906*
	Loss	17	.0162561			

*, **, *** indicate the level of significance @ 10%, 5% and 1% respectively

Table 4 on the independent sample t-test shows that the mean values of the Cost of Goods Sold to Sales ratio, considering profit and loss, are 0.6048924 and 1.244741, respectively. There is a difference of -0.6398489, which is statistically significant ($\alpha = 0.000$). From these findings, it can be inferred that the mean value of the Cost of Goods Sold to Sales ratio is much higher for companies that are facing losses.

The mean values of the Administrative Expenses to Sales ratio, considering profit and loss, are 0.0622351 and 0.3384952, respectively. There is a difference of -0.2762602, which is statistically significant ($\alpha = 0.0006$). The findings indicate that companies facing losses spend more on administrative expenses compared to companies making a profit.

The mean values of the Selling, Marketing, and Distribution Expenses to Sales ratio, considering profit and loss, are 0.124742 and 0.1948741, respectively. There is a difference of -0.070132, which is statistically significant ($\alpha = 0.0477$). The findings indicate that companies facing losses spend slightly more on Selling, Marketing, and Distribution Expenses compared to companies making a profit.

The mean values of the Finance Cost to Sales ratio, considering profit and loss, are 0.0338615 and 0.109319, respectively. There is a difference of -0.0754574, which is statistically significant ($\alpha = 0.0000$). The findings indicate that companies facing losses spend slightly higher on Finance Cost compared to companies making a profit.

There are no significant variances between the mean values of profit and loss for the Workers Profit Participation Fund (WPPF) and tax expenses.

Considering the variables taken for this study, the most crucial factor is the cost of goods sold, as there are significant differences in the mean values of this expense. Therefore, companies should emphasize reducing this cost by focusing on automation of production, sourcing materials from low-cost suppliers, or minimizing labor costs for production.

Since administrative expense is also a crucial factor, companies facing losses should focus on lean operations, i.e., reducing administrative expenses that don't have any indirect impact on generating profit. The same consideration also applies to selling, marketing, and distribution expenses.

Robust OLS, Random Effect Model, and Fixed Effect Model

Table 5 presents the estimation results for the panel analysis model described in Equation 1. In this model, the dependent variable is profitability (PAT), and the independent variables are expenses (CGS, ADME, SMDE, FINC, WPPF, and TAXE).

Table 5. Summary of OLS, Fixed Effect, and Random Effect Models

	OLS (Robust)		Random Effect Model		Fixed Effect Model	
	Coef.	P Value	Coef.	P Value	Coef.	P Value
CGS	-.7072786	0.000***	-.9547294	0.000***	-.9764042	0.000***
ADME	-1.23147	0.000***	-1.032428	0.000***	-1.014599	0.000***
SMDE	-.8577386	0.000***	-.9691291	0.000***	-.9705178	0.000***
FINC	-1.240847	0.000***	-.89776	0.000***	-.866383	0.000***
WPPF	.4579949	0.739	-1.510216	0.001***	-1.6035	0.000***
TAXE	-.0582676	0.716	-.03981	0.741	-.0126381	0.916
Constant	.7610437	0.000***	.9212361	0.000***	.9344896	0.000***
R-squared	0.9764					
Within R-squared			0.9967		0.9967	
Observations	180		180		180	
F-statistic	2386.57		40263.10		7187.80	

P-value	0.0000***	0.0000***	0.0000***
Hausman test			0.0000***

*, **, *** indicate the level of significance @ 10%, 5% and 1% respectively

In the OLS (Robust) model, the R-squared value is 0.9764, and the model is significant ($\alpha = 0.0000$). Out of the six independent variables, four (CGS, ADME, SMDE, FINC) have significant impacts, while two (WPPF, TAXE) have insignificant impacts on profitability. One interesting finding is that the expense for the Workers Profit Participation Fund (WPPF) has a positive impact ($\beta=0.4579949$) on profitability, although it is statistically insignificant ($\alpha = 0.739$). Generally, expenses negatively impact profitability, but the OLS regression results show otherwise, indicating that spending on employee welfare positively impacts profit.

Since the data is in panel form, the Random Effects Model is applied. It is found that the R-squared (within) value is 0.9967 and statistically significant ($\alpha = 0.0000$). The findings from the Random Effects Model show that out of the six independent variables considered in this study, five (CGS, ADME, SMDE, FINC, WPPF) have significant impacts on profitability, while only one variable (TAXE) does not have any significant impact. After the random panel regression, the Breusch-Pagan Lagrange Multiplier (LM) Test was conducted to test the appropriateness of the panel analysis. Since the p-value is significant, the null hypothesis is rejected, indicating that the panel model is appropriate.

To control all time-invariant differences between the units (here, the firms), the Fixed Effect Model is used. From the Fixed Effect Model output, it was found that the R-squared (within) value is 0.9967, and the model is statistically significant ($\alpha = 0.0000$). Out of the six variables considered in this study, five (CGS, ADME, SMDE, FINC, WPPF) have significant impacts on profitability, while only one variable (TAXE) does not have any significant impact. To choose between the Random Effects and Fixed Effects models, the Test of Hausman Specification was performed and found a significant p-value ($\alpha = 0.0000$), indicating that the Fixed Effects model is more consistent compared to the Random Effects model.

From all the above findings, it can be deduced that to increase the profitability of a firm, there should be a focus on minimizing costs such as the cost of goods sold, administrative expenses, selling-marketing-distribution expenses, and finance costs. All other expenses are not as significant in influencing profitability. Interestingly, it should be noted that contributions to employees' provident funds may help boost profits, though this finding is not statistically significant.

Based on the Hausman test (p-value=0.0000), the fixed effects model is estimated more appropriate for estimation. The estimation output from the fixed effects model indicates that a one-unit increase in CGS will decrease profitability by 0.9764042, similar to the findings of Milán et al. (2014). A one-unit increase in ADME will reduce profitability by 1.014599. This is consistent with Kisyeri's (2022) findings that administrative costs negatively impact firm profitability. Considering all cost impacts on profitability, administrative expenses have the most significant effect. Therefore, to increase profitability, managers should prioritize minimizing these costs. The findings also show that a one-unit increase in SMDE will reduce profitability by 0.9705178, a one-unit increase in FINC will reduce profitability by 0.866383, and a one-unit increase in WPPF will decrease profitability by 1.6035. All these effects are statistically significant. However, the coefficient for TAXE is not significant, indicating that a one-unit increase in TAXE has no significant impact on profitability.

The endogeneity test is conducted to determine whether any endogenous variables exist. The test results indicate that there is no endogeneity problem. Therefore, the Generalized Method of Moments (GMM) model or Dynamic Panel Data model is not applied in this study. Without the proper specification of endogenous and instrumental variables in the Dynamic Panel Data model, the estimates would be inconsistent, leading to incorrect decision-making.

The analysis reveals two noteworthy findings. First, among all cost-related factors affecting profitability, administrative expenses exert the most substantial influence. This result aligns with the findings of Meshkova and Topchi (2021). Second, the pooled OLS regression indicates that the Workers' Profit Participation Fund has a positive and statistically significant impact on profitability, a conclusion consistent with the earlier work of Doucouliagos (1995).

DISCUSSIONS

This study examines the impact of cost structure on profitability using panel data, with the aim of providing managers with clear insights into which costs should be prioritized for control and reduction to improve overall profitability. Among the six variables examined in this study, five (CGS, ADME, SMDE, FINC, and WPPF) show significant effects on profitability, whereas one variable (TAXE) does not exhibit any significant impact.

The analysis shows that Costs of Goods Sold (COGS) reduce a firm's profitability, consistent with the findings of Naoum et al. (2024). Therefore, effective management of COGS, mitigation of cost stickiness, and strategic use of pricing power are essential mechanisms for sustaining corporate profitability (Ibrahim et al., 2022). When examining the overall impact of costs on profitability, administrative expenses emerge as the most influential factor. Administrative expenses (ADME) are found to reduce profitability, a result consistent with the findings of Dawood (2024). Therefore, the implementation of stringent controls on administrative spending may allow firms to reallocate resources more efficiently toward growth and expansion objectives.

The findings further indicate that selling, marketing, and distribution expenses (SMDE) negatively affect a firm's profitability, consistent with the results reported by Xia et al. (2024). To mitigate these costs, firms may adopt cost-sharing arrangements and strategically manage inefficient distribution channels (Taleizadeh et al., 2025). The results of the analysis also indicate that finance costs (FINC) diminish a firm's profitability. This finding is consistent with the study of Dsouza et al. (2025), which demonstrated that beyond a certain threshold, finance costs exert a negative impact on profitability.

Furthermore, prior research suggests that smaller firms are disproportionately affected when relying on loans as a source of financing, primarily due to the imposition of stricter credit terms (Alabdulkarim et al., 2024).

The findings regarding Workers' Profit Participation Fund (WPPF) expenses are mixed. Typically, expenses are expected to reduce profitability; however, the OLS regression results indicate that WPPF has a positive effect. In other words, spending on employee welfare appears to enhance profitability, a result consistent with the findings of Doucouliagos et al. (2020). Nevertheless, in this study, the effect is not statistically significant. Since profit sharing is often associated with higher productivity through increased employee motivation, companies should examine this issue further. Conversely, the fixed effects model suggests that WPPF has a negative impact on profitability, highlighting the need for further investigation in future research.

The output from the fixed effects model indicates that tax expenses (TAXE) do not have a significant impact on a firm's profitability. This finding aligns with previous studies that have reported mixed results, showing both negative and positive effects of tax expenses on profitability (Gabrielli & Greco, 2023; Rompotis, 2024). Such variation may be attributed to the diverse tax measures imposed by governments across different firms.

The overall analysis highlights two noteworthy results. First, among all cost-related factors influencing profitability, administrative expenses exert the most substantial impact. Second, the pooled OLS regression suggests that the Workers' Profit Participation Fund positively affects profitability. Firms may consider focusing on these two aspects to achieve more favorable profitability outcomes.

CONCLUSIONS

This study aims to demonstrate the impact of cost structure on profitability using panel data. The Fixed Effects Model, determined as appropriate on the basis of the Hausman test, was employed for the analysis. Results from the Fixed Effects Model indicate that five out of six variables (Cost of Goods Sold, Administrative Expenses, Selling-Marketing-Distribution Expenses, Finance Cost, and Contribution to Workers Provident Fund) significantly impact profitability, while Tax Expense has no significant impact.

The findings indicate that the manager can substantially improve profitability by reducing costs such as Cost of Goods Sold, Administrative Expenses, Selling, Marketing, and Distribution Expenses, Finance Costs, and contributions to the Workers Provident Fund. Moreover, robust OLS findings reveal a positive impact of contributions to the Workers Provident Fund on profitability. This is a noteworthy finding (although not statistically significant) because expenses typically decrease profitability, whereas this result suggests that spending on welfare funds can enhance it.

The theoretical contribution of this study is twofold. First, unlike previous research that focused on specific costs, this study incorporates all costs as independent variables. Second, while we hypothesized a negative relationship between expense and profitability, our Robust OLS regression revealed a surprising positive impact of workers' provident fund (WPPF) contributions on profitability. However, this finding warrants further investigation as the WPPF estimate is not statistically significant in the Robust OLS model, opening new avenues for research.

The managerial implications of the study are that managers can use its findings to determine which cost to focus on reducing, ultimately increasing profitability. A special focus should be given to administrative expenses, as they have the most substantial impact on profitability.

This study utilizes data from only one industry in Bangladesh. To enhance the study's generalizability, data from other industries could be incorporated to test the hypothesis. Additionally, employing more narrowly defined and specific cost-related items as independent variables could provide deeper insights into their impact on profitability. For example, this study adds up the costs of selling, marketing, and delivering products into one variable. But it would be better to look at each of those costs separately (like advertising or shipping costs) to see how they affect profits.

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