The Impact of Cost-Volume-Profit Analysis on Managerial Decision Making in Bangladeshi Water Manufacturing Companies

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Abstract:
The cost-volume-profit analysis (CVP analysis) stage of knowledge is presented in this research, along with its goals, concepts, and applicability to the cost control of Bangladeshi water produc--ing companies. Determining the connection between cost and profitability is the paper's primary goal. In order to accomplish the primary objective of the study, we tackled concepts like costs, sales, production volume, profit, decision making, and what-if analysis required by management to create many scenarios on production volume, cost, and sales price that result in definitive decisions in the near future. The research approach is limited to an archival study pertaining to a literature evaluation and aligns with the research objective. The water production company served as the research's foundation, and we examined how CVP analysis affected their operations. The primary data for the study was gathered using an online survey and a quantitative methodological approach. The manufacturing company in Bangladesh is the target market. The data came from 90 respondents who were employed by manufacturing companies' finance and accounting divisions. The social science statistical software SPSS (version 21) and the regression method of data analysis were used to analyze the data. **Findings:** The study demonstrated how crucial cost-volume-profit analysis is to any production company's decision-making process. The findings also demonstrate a strong correlation between total income and managerial decision-making, as well as a positive correlation between unit variable cost and managerial decision-making. These results imply that while making managerial decisions, manufacturing companies should apply their knowledge of cost volume profit analysis. In order to achieve an effective profit, the researchers concluded by recommending that manufactu--ring companies examine their CVP analysis, which is made up of unit variable cost and total revenue, and do a thorough examination of it before making managerial decisions. Additiona Additionally, they recommended using the findings of a company's cost volume analysis to make sure the business doesn't waste money on production.

Keywords:
Cost, Volume, Profit, managerial decision--making.

1.Background of the Study:

The publications of Hess, Mann, and 1907, which separated fees into fixed and variable factors and made the assumption that there was only one product and no uncertainty, are where the idea for the cost volume profit (CVP) model originated. Williams (2024) proposes a new distinction between the many cost components that companies must deal with by creating a new class of pricing (semi-variable charges), which includes prices that aren't instantaneous.

Planners and decision-makers are interested in the possible hazards connected to the choices they make. For example, the number of screenings required for a new picture in order for the company to recover all of its production costs and make the targeted profit would have surprised a film producer (Atkinson, 2022).

To gauge a project's risk, many decision-makers consider the likelihood of at least breaking even or making a goal profit. When an actual number differs from a predicted value,uncertaintyarises.

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Understanding the connection between an assignment's sales, charges, and income requires a strong background in cost and revenue behavior (Matsumura, 2022). The CVP analysis compiles all of the company's financial data and focuses on the relationships between pricing, quantity supplied, and costs.

CVP analysis can be a useful method for determining the severity and scope of a company's financial issue as well as for helping to choose the crucial remedy. This study's main objective is to create strategies to help decision-makers deal with the limitations of the CVP model (Hansen, 2020).

Companies can produce a wide range of products and split the overhead expenses among them globally (Noreen, 2023). The employer may also need to modify the CVP evaluation to suit their product mix (Noreen, 2023).

To do this, production is carefully separated into batches. After that, the CVP receives the batch values uniformly as a single product. Batch sales and variable costs can be defined using the batch as a whole (Glautieret, 2023).

However, the intricacy of the matrix structure is now causing problems that result in unclear roles, a lack of responsibility, and low profit margins. In addition to the need for flexibility, a corporation is going through a strategic transformation. The volume cost profit analysis technique, which greatly expedites the process of reevaluating the current corporate structure and decision-making culture, can be used by a company to analyze its production expenses. This study will compare how cost volume profit analysis is applied in managerial decisions made by manufacturing organizations because of these challenges, which are currently a major problem in the manufacturing industries.

Examining the managerial decision-making processes used by Bangladeshi industrial businesses is the main objective of this study. Examining how total variable costs affect management decisions in Bangladeshi businesses is the main objective of this paper. The second objective is to ascertain how total income affects managerial decisions made in Bangladeshi businesses.

2.Literature Review

2.1Theatrical Framework Classical economics theory:

Adam Smith's Theory of CVP Analysis, a popular economics theory created in the late 18th and early 19th centuries, will serve as the study's theoretical cornerstone. This theory states that if there is perfect competition and a company's marginal income is equal to its marginal cost, it will produce a normal profit (Datar, 2019).The foundation of this study is the notion that management's objective is to maximize profit, which is determined by subtracting total expenses from total income (Horngren, 2019). Therefore, management is responsible for selecting and implementing the most lucrative course of action after considering the cost of production. Traditional economic theory is frequently supported by accountants. But as mentioned by (Mahar ,2018).

2.2.Review-related Literature

2.2.1.The concept and definitions of CVP analysis:

You can methodically examine how changes in activity (or output) impact total sales income, costs, and net profit by using a CVP analysis (Drury, 2015). It is a mathematical representation of the cost-effectiveness of producing a good The relationships between a product's revenue and cost functions are represented by the CVP model, which is used to evaluate the financial impact of various operational and strategic decisions. Cost-volume-profit analysis is a planning approach that can be very useful in predicting sales and profit levels given a particular cost structure (Burch, 2015).

Industrial companies that produce physical goods, like furniture, have been the main users of traditional CVP analysis. However, the concept itself is applicable to service companies such as those in the banking, insurance, and other financial services industries (Ihemeje, 2015).

2.2.2.Cost

There are various interpretations of the term "cost." The Chartered Institute of Management Accountants (CIIMA) defines a cost as the actual or hypothetical amount of money spent on a certain commodity or service. Cost is the value of the financial resources used in the production of goods and services, according to Okoye (2015)

2.2.3 Volume

The number of goods or services that a business sells during regular business hours in a given period of time, as well as the

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volume at which something is heard or the space that something occupies (Baumol, 2015).

2.2.4 Profit

The definition of "profit" varies depending on the individual. Generally speaking, profit is seen as revenue for the stockholders (Dwivedi, 2018). An accountant defines profit as the total of all realized revenues less all recognized expenses, such as manufacturing costs and overhead.

2.2.5. Managerial decision-making concepts and terminology:

Since decision-making is the process of creating decisions, it is essential to identify a choice while talking about decision-making. To effectively describe management accoun--ting as an essential component of management and a decision-making tool, this is required. A decision is typically defined as selecting a course of action that will result in a specific intended outcome. This illustrates that choosing a course of action from a variety of possibilities is not a process that is done at random. Burstein (2018)

2.2.6. The relationship between managerial decision-making and CVP analysis:

Manufacturing companies may use cost volume profit analysis to obtain a thorough understanding of their production chain and identify the linkages that impact the company's ability to generate a profit (Martland, 2019). The current outcomes of the study indicate that in order to make an efficient managerial decision, a corporation needs to conduct a cost volume profit analysis. This research will help manufacturing organizations achieve effective profitability in addition to identifying opportunities for improvement. Thus, it can be said that the use of cost volume profit analysis plays a significant role in the managerial decisions made by industrial businesses (Maryland, 2019).

2.2.7 Conceptual framework

Using total revenue, the managerial decision-making process, and the selected independent variables of total revenue and variable cost as dependent factors. Therefore, the primary focus of this study is the research framework that follows.

3.0 Methodology

Bangladeshi water production companies are the study's target audience. Nonetheless, the research team selected a few water manufacturing company, such as Kinley-Coca-Cola mineral water, Fresh -Meghna Group, and MUM-Partex Group. There were 100 participants in all, 33 from the MUM-Partex Group, 33 from the Freash-Meghna Group mineral water, and 34 from the Kinley-Coca-Cola mineral water. From the target population of 100 employees, the researchers selected 90 responses for the sample size. The majority of responders were 32 Mum, 30 Freash, and 28 Kinley.

4.Findings and Discussions

4.1Analysis of Response Percentage:

Description	Number	Percentage (%)
Questionnaires Administered	**90**	**100**
Questionnaires Not Received	0	0
Responses Received	90	100
Invalid Responses	0	0
Valid/Usable Responses	90	100

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4.2.Demographic data:

Variable	Frequency	Percentage %
Gender		
Male	68	75.5
Female	22	24.5
Total	**90**	**100**
Age		
less than 30	13	14.44
31-40	45	50.0
41-50	18	20.0
51-60	9	10.0
60-above	5	5.56
Total	**90**	**100**
Educational level		
Secondary	14	15.55
Higher Secondary	6	6.67
Bachelor	46	51.11
Master	15	16.67
Ph.D	9	10.0
Total	**90**	**100.0**
Job category		
Owner	20	22.22
Manager	25	27.78
Employee	45	50.0
Total	**90**	**100.0**
Experience		
less than one year	8	8.89
1-3 years	12	13.33
3-6 years	45	50.0
more than 6 years	25	27.78
Total	**90**	**100.0**
Company		
MUM-Partex Group	32	35.56
Fresh -Meghna Group	30	33.33
Kinley-Coca-Cola	28	31.11
Total	**90**	**100.0**

Source : Primary data 2025

The study's descriptive data showed that the industry is dominated by men, with 68 (75.5%) of the respondents being men and the remainder 22 (24.5%) being women. Additionally, 45 (50%) of the respondents were between the ages of 31 and 40, 13 (14.44%) were under 30, 18 (20%) were between the ages of 41 and 50, 9 (10%) were between the ages of 51 and 60, and 5 (5.56%) were 60 years of age or older. 15.55% of the 90 respondents held a secondary degree. The percentage of responders with a Higher Secondary was just 6.67%. The biggest percentage of employees—51.11%—have a bachelor's degree. Ten percent of the delegates were master's degree holders. 10% of those surveyed hold a Ph.D.

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In spite of this, the years of experience of the responders are also listed in the report. Since just 8 (8.89%) of our target respondents had less than a year's experience, 12 (13.33%) had between one and three years' worth, 45 (50%) had between three and six years' worth, and 25 (27.78%) had more than six years' worth, it is evident that the bulk of them had three to six years or more. As a result, the table shows the categories of respondents who took part in the company's study. Of the 90 participants in the survey, 32 (35.56%) came from Mum, 30 (33.33%) from Fresh, and another participant was Kinley for 28 (31.11%), suggesting that these companies are reachable in the manufacturing distribution.

The Impact of variable cost(PU) ,Fixed Cost(PU) ,Total Revenue (PU) EAT(PU) on managerial decision making in manufacturing Company:

Table : Comparing profitability data for three companies

Company Name	ToTal Sales (L)2025	Variable Cost (PU)	Fixed Cost (PU)	Total Cost (PU)	Selling Price(PU)	EBT(PU)	Tax (50%)	EAT (PU)	profit %
MUM-Partex Group	100000	19	5	24	30	6	3	3	10
Fresh-Meghna Group	100000	18	5	23	30	7	3.5	3.5	11.7
Kinley-Coca-Cola	100000	17	4.5	21.5	30	8.5	4.25	4.25	14.2

Source: Data analysis(2025)

The table comparing profitability data for three companies, with each company showing the same total sales volume (100,000 liters in 2025) but different costs and profits.

- Total Sales (L) 2025 — all three have 100,000 liters
- Variable Cost (PU) — cost per unit that varies with production
- Fixed Cost (PU) — fixed cost allocated per unit
- Total Cost (PU) — variable + fixed cost per unit
- Selling Price (PU) — all are 30
- EBT (PU) — Earnings Before Tax per unit
- Tax (50%)
- EAT (PU) — Earnings After Tax per unit
- Profit %

Company comparison

1.MUM-P.artex Group
- Variable Cost: 19
- Fixed Cost: 5
- Total Cost: 24
- Selling Price: 30
- EBT: 6
- Tax: 3
- EAT: 3
- Profit %: 10%

2.Fresh - Meghna Group
- Variable Cost: 18
- Fixed Cost: 5
- Total Cost: 23
- Selling Price: 30
- EBT: 7
- Tax: 3.5
- EAT: 3.5
- Profit %: 11.7%

3.Kinley - Coca-Cola
- Variable Cost: 17
- Fixed Cost: 4.5
- Total Cost: 21.5
- Selling Price: 30
- EBT: 8.5
- Tax: 4.25
- EAT: 4.25
- Profit %: 14.2%

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Kinley–Coca-Cola has the lowest costs and highest profit margin (14.2%), making it the most profitable in the comparison. Fresh–Meghna Group is second in profitability. MUM-P.artex Group has the highest costs and lowest profit margin.

4.3.Descriptive Data:

Descriptive Statistics

	Mean	Std. Deviation	N
EATPU	3.5833	.62915	3
SellingPricePU	30.00	.000	3
TotalCostPU	22.833	1.2583	3

Descriptive Statistics Interpretation

Variable	Mean	Std. Deviation	N	Interpretation
EATPU	3.5833	0.62915	3	The average EATPU value is about 3.58, with moderate variation among the 3 observations.
SellingPricePU	30.00	0.000	3	The average selling price per unit is 30, and since the standard deviation is 0, all 3 observations had exactly the same selling price.
Total CostPU	22.833	1.2583	3	The average total cost per unit is about 22.83, with some variation (greater spread than EATPU).

Additional Notes: N = 3 means only three observations were used, which is a very small sample. Conclusions should be drawn cautiously. **Standard Deviation (SD)** shows how spread out the values are: 0.000 means no variation at all. Higher SD means more variability. Since SellingPricePU is constant (30 for all cases), it does not vary across observations.

Possible Business Insight

If EATPU represents earnings/profit per unit, then:

- Selling price is fixed at 30.
- Average cost is 22.833.
- Average gross margin per unit would be approximately: 30−22.833=7.16730 - 22.833 = 7.16730−22.833=7.167

4.4.Analysis of Correlation:

Correlations

		EATPU	SellingPricePU	TotalCostPU
Pearson Correlation	EATPU	1.000	.	-1.000
	SellingPricePU	.	1.000	.
	TotalCostPU	-1.000	.	1.000
Sig. (1-tailed)	EATPU	.	.000	.000
	SellingPricePU	.000	.	.000

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	TotalCostPU	.000	.000	.
	EATPU	3	3	3
N	SellingPricePU	3	3	3
	TotalCostPU	3	3	3

This table shows the Pearson correlation among EATPU, Selling PricePU, and Total CostPU.

1.Relationship between EATPU and Selling PricePU

- This happens because Selling Price PU has no variation (its standard deviation was 0.000 in your descriptive statistics; all values were 30).
- A variable with no variation cannot produce a meaningful correlation.

2. Relationship between EATPU and Total CostPU

Pearson correlation = -1.000 This indicates a perfect negative relationship: As Total CostPU increases, EATPU decreases in exact proportion. Sig. (1-tailed) = .000 This suggests statistical significance.

3. Relationship between Selling PricePU and Total CostPU

Again shown as (.), meaning correlation is not interpretable because Selling PricePU is constant. A perfect correlation **(**-1.000**)** with only three observations often happens because of the tiny sample rather than a true real-world perfect relationship.
EATPU and TotalCostPU had a perfect negative association (r = -1.000, p <.001) according to Pearson correlation analysis, meaning that declines in EATPU were linked to rises in total cost per unit. The lack of variance in selling price between observations made it impossible to interpret correlations using Selling PricePU.

4.5.Analysis of Regression:

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	TotalCostPU[b]	.	Enter

a.Dependent Variable: EATPU
b.All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	**1.000[a]**	**1.000**	**1.000**	**.00000**	**1.000**	**.**	**1**	**1**	**.**

a. Predictors: (Constant), TotalCostPU
This table is a **simple linear regression output (SPSS)**.

(1) Model Summary:

R = 1.000 → Perfect correlation between DV and IV R Square = 1.000 → 100% variation explained .Adjusted R Square = 1.000 Std. Error of Estimate = 0.00000 → No prediction error
Meaning: Total CostPU perfectly predicts EATPU

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ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.792	1	.792	.	.[b]
	Residual	.000	1	.000		
	Total	.792	2			

a. Dependent Variable: EATPU
b. Predictors: (Constant), TotalCostPU

(2) ANOVA Table:
Since Residual = 0, there is no error, so SPSS cannot compute proper F value and Sig. (it shows dot "."). This happens because the data is too perfect or sample size is extremely small.

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
	B	Std. Error	Beta			Zero-order	Partial	Part
(Constant)	15.000	.000						
1 TotalCostPU	-.500	.000	-1.000			-1.000	-1.000	-1.000

a. Dependent Variable: EATPU

(3) of Coefficients :
Regression Equation:
EATPU=15.000−0.500(TotalCostPU)EATPU=15.000-0.500(TotalCostPU)EATPU=15.000−0.500(TotalCostPU)
Interpretation: If TotalCostPU increases by 1 unit, then EATPU decreases by 0.5 units. Relationship is negative.
(3) Correlation: Zero-order correlation = -1.000 Partial correlation = -1.000 Part correlation = -1.000 This is a perfect negative relationship.

4.6.Summary and Suggestions:
The impact of Total CostPU on EATPU was investigated using a straightforward linear regression analysis. The regression model was an excellent fit for the data, according to the results.
According to the model summary, the independent and dependent variables have a perfect relationship, with a correlation coefficient of R = 1.000. The coefficient of determination was R^2 = 1.000, indicating that Total CostPU accounts for 100% of the variance in EATPU. The model's strength is confirmed by the corrected R2 score of 1.000.
The regression coefficients show that EATPU is negatively impacted by Total CostPU. The unstandardized coefficient value, B=-0.500, indicates that EATPU falls by 0.5 units for every unit increase in Total CostPU. The constant value was 15.000, meaning that the expected value of EATPU is 15.000 when Total CostPU is zero.

Therefore, the regression equation can be written as:

EATPU=15.000−0.500(Total CostPU)EATPU = 15.000 - 0.500(Total CostPU)EATPU=15.000−0.500(Total CostPU)
Overall, the results demonstrate a perfect negative association between the variables and reveal that Total CostPU is a major predictor of EATPU.

4.7.Ideas for Additional Research:
The critical relationships between cost

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volume profit (CVP) factors and decisions should be the focus of future empirical study in the field of CVP analysis and its application to decision-making in Bangladeshi businesses. This would enable us to confirm and strengthen the consistent impacts of cost volume profit (CVP) analysis on business decision-making processes.

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