

Analyzing Cost Volume Profit Relationship on Small Fast Food Shop (A Study on Bangladeshi Fast Food Industry)

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ABSTRACT: The paper presents the stage of knowledge the cost-volume-profit analysis (CVP analysis), namely the principles, objectives and its usefulness for the cost management of small fast food business. The main objective of the paper is to establish the relationship between cost and profitability. To achieve the main goal of the research, we approached concepts such as costs, sales, production volume, profit, decision making, what if analysis needed by the management to develop different scenarios on production volume, cost, sales price that lead to conclusive decisions in the near future. The research methodology corresponds to the research objective and is circumscribed to an archival research regarding literature review. The basis of the research is the small fast food business, in which we studied the impact of CVP analysis on their activity. To reach the aim of the research, we have developed a questionnaire to conduct the research. Two types of questionnaires have been developed for identifying the financial factors and non-financial factors. Most of the businesses are not interested to disclose their information which is a barrier to conduct a survey. When I circulate the questionnaire to fifteen different types of small fast food business, among them twelve shops agreed to participate in the survey. For determining the relationship strength among the variable I choose correlation and coefficient analysis. I also analyzed the upper limit and lower limit for correlation and coefficient. I conduct one sample T-Test with multiple regression to test the hypothesis considering $H_0 =$ No Relationship between (cost, volume) and profitability. As we know the fast food industry is very large, so it's very difficult to cover the whole industry. For this reason I focused on only the small fast food business. There is also limited numbers of journal publications available in online that hinder to construct most informative literature review. So, in near future before conducting a research we can take permission from business authority that will add value to further research and we should collect financial information for determining the relationship among cost, volume and profitability. We have to focus on developing relationship based on categorical variables that limit the outcome of the research where as actual relationship can only be determined on the basis of real life financial information. For conducting a more accurate research number of variables could be more for both financial and non financial side of a business.

KEYWORDS: Cost, Volume, Profitability, Small Fast Food, Regression Analysis

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I. INTRODUCTION

Fast food industry is one of the most fast growing sectors in Bangladesh. Competition in this sector has become very acute. Urban population growth has stimulated a rise in the number of fast food vendors in many cities throughout the country. Migration from rural areas to urban areas has created a daily need among many working people to eat outside the home. Demand for relatively inexpensive, ready-to-eat food has increased as people, especially women, have less time to prepare meals. (Harun, M. A., Ahmed, F., & Maniruzzamann, 2013). As a result, in the urban areas demand for fast food has increased a lot.

The term "Fast foods" describes a wide range of ready-to-eat foods and beverages sold and sometimes prepared in public places. In fast foods, the final preparation of foods occurs when the customer orders the meal which can be consumed where it is purchased or taken away. Fast foods are low in cost compared with restaurant meals and offer an attractive alternative to home-cooked food (Winarno, 1986). Fast foods often reflect traditional local cultures and exist in an endless variety. There is much diversity in the raw materials as well as in the preparation of fast food beverages, snacks and meals. By contrast, fast food outlets specialize prepared Fried chicken, Pizza, Pasta, Burger, Samosa, Subway, Chicken tikka, Sandwich, Chicken pakura, Chicken soup, roll (chicken, beef), Spaghetti, noodles, sausage, and pastry and so on. Side dishes include French fries, onion rings, salads. These are the mostly eaten fast foods items by the consumers.

The price range of fast food items varies from small fast food to large or regular fast food shop. The shops which are not big in size and which started their business with a small amount of capital are considered as small fast food shops. Most of the time the people of middle class goes to the small fast food shops and people of higher class goes to the large or regular fast food shops. Most of the time the price range of fast food items

remains in between (50-500) TK. Food costing in the fast food is complex and challenging. Any wrong estimation of cost will result wrong determination of profitability. For The fast food business Cost-volume-profit (CVP) analysis will give a complete idea about the profit and loss of this business and also give an idea about the sales, quantity, break-even point. Cost-volume-profit (CVP) analysis is a technique that examines changes in profits in response to changes in sales volumes, costs, and prices. The cost volume analysis uses the techniques of breakeven analysis, operating leverage, margin of safety and effect of changes on sales and contribution on margin and net operating income. The level of sales needed to achieve desired target profit, in order to predict changes in net operating income. For analyzing Cost Volume Profit (CVP) on street food these terms is necessary: which products to emphasize, the volume of sales needed to achieve a targeted level of profit, the amount of revenue required to avoid losses, whether to increase fixed costs, whether fixed costs expose the organization to an unacceptable level of risk. (Josh, 2004)

II. OBJECTIVES OF THE RESEARCH

The main objective of this paper is to analyze the relationship between profit and cost. This paper mainly assists in the overall costing process, the volume of activity, and cost behavior for small fast food business by identifying different types of cost items such as variable expenses and fixed expenses. This paper also accommodates in the profitability analysis of CVP by determining the level of sales needed to achieve a desired breakeven point and target profit. This paper also abets in assessing the effect of changes in cost, selling price and unit sold on the breakeven point and target profit. Focus is also placed on pricing policy and structure among the competitors. Evaluating the performance of CVP analysis for multiple products is one of the specific objectives of this paper.

III. SCOPE OF THE RESEARCH

In the limitation part I have discussed some issues that can be overcome or improved by conducting further research. Fast food industry in Bangladesh is huge and demand for fast food is increasing day by day. So there will be amplified information available for further research.

IV. REVIEW OF THE LITERATURE

Fast foods are described as wide range of ready-to-eat foods and beverages prepared and sold by mobile or stationary vendors around public institutions such as schools, hospitals, railway stations and bus terminals. Fast foods feed millions of people daily with a wide variety of foods that are relatively cheap and easily accessible. Fast foods offer a significant amount of employment, often to persons with the little education and training (FAO, 1997).

In fast food items menus are almost same from location to location, and consumers enjoy a familiar experience no matter where they are, with a reliable level of quality. As we know Consumers of fast food mostly focus on taste, quality and profit so proper costing is pre requirement of fast food items. In fast food industry proper costing is very important to recognize the sales, quantity and profit, so before involving in fast food industry we have to ensure the cost volume profit analysis is done properly.

The cost-volume-profit (CVP) analysis is a management accounting tool to show the relationship between these ingredients of profit planning, it is one of the most hallowed, and yet one of the simplest analytical tool in management accounting. Cost-volume-profit (CVP) analysis is an important tool that provides the management with useful information for managerial planning and decision-making. Profit of a business firm is the results of interaction of many factors.(Habeeb, 2012) such factors influencing the level of profits, the following are considered the key factors: selling price, volume of sales, variable costs on a per unit basis, total fixed cost.

To do an effective job in planning and decision -making, the management must have analyses which allow reasonably correct predictions of how profit will be affected by a change in any one of these factors. Also, management needs an understanding of how revenues, costs and volumes interact in providing profits. All these analysis and information are provided by cost-volume-profit analysis. Cost-volume-profit analysis is a systematic method of examining the relationship between selling price, total sales revenue, and volume of production, expenses and profit. This analysis simplifies the real world conditions that a business enterprise is likely to face.(Habeeb, 2012) CVP analysis can play an important role by providing the management with information regarding financial result if a specified level of activity or volume fluctuates, information on probable effects of changes in selling price and other variables. CVP analysis focuses on prices, revenues, volume, costs, profits and sales mix and on the inter-relationship between them during the short-run. The short-run is generally considered a period of one year or less than one year during which the production of a business enterprise cannot be increased and is limited to the available current operating capacity of the enterprise. During the short-run, the capacity of the plant and machinery cannot be increased (this is possible during the long-term only) and therefore, production is limited in terms of available plant facilities. Similarly, it takes time to reduce

the capacity of plant and machinery and therefore, a business enterprise should operate during the short-run relatively on a constant quantity of production resources. Besides, no changes in cost and prices data can be generally made during the short-term as they might have already been determined. (Habeeb, 2012) During the short-run, however, some resources like materials and unskilled labors can be increased at a short notice. Thus during the short-run, sales volume and short-run profitability can be the only vital area which may be found uncertain. CVP analysis herein reveals the effect of changes in sales volume on the level of profits. CVP analysis, in this way, is an integral part of financial planning and managerial decision-making. In CVP analysis, all expenses are classified into fixed and variable. Semi-Variable expenses have to be divided into their fixed and variable elements. Total variable costs are considered to be those costs that vary as the production volume changes. In a factory, production volume is considered to be the number of units produced, but in a governmental organization with no assembly process, the units produced might refer. These steps are important prerequisites to any CVP analysis and a proper understanding of them is essential for reliable conclusions. Based upon a knowledge of fixed and variable cost elements and CVP analysis, it is possible to determine break-even sales volume, to compute the sales needed to generate desired profits and to supply answers to many questions that arise in the course of management planning and decision making. (Habeeb, 2012)

From the above discussion we can generate a basic idea about cost volume profit relationship. So, in food costing these terms will create a good impact to properly run the fast food business

Collecting official numbers of fast food vendors becomes difficult as this group does not pay any tax. According to a report there are as many as 200,000 fast food vendors in Dhaka city who are increasing mainly due to the demand of an urban population growing at a rate of 5 per cent a year (Ahmed, 2000). A recent study forecasts that Dhaka will move up from 10th (having 13.09 million people in 2006) place to 4th place by 2020 (having 22.04 million people) as the world's largest urban area (www.citymayor.com). With increasing number of people coming from rural areas in quest of employment every year, the resulting phenomena such as overcrowding and inadequate sanitary and other infrastructure has created great challenges to food systems and their management.

Within this context, fast foods as an informal food supply system, provided opportunities for resource-poor groups in urban and pier-urban environments, not only as a means of employment but also as an effective way of providing low cost nutrition to the people (Codjia, 2000).

An Example of Cost-Volume-Profit Analysis:

At the beginning, we are going to show and discuss an example of pre-cost determination of chicken burger. All these information have been collected from a local burger shop. Most of the information was based on a month and we have converted them into per piece of chicken burger. We have shown the calculation into four steps:

- a) Determining and allocation of fixed costs.
- b) Determining and allocation of raw material costs.
- c) Determining and allocation of variable costs
- d) Total Cost for per piece of chicken burger.

Determining and allocation of fixed costs:

At the very beginning I have identified the fixed cost items. When we have visited the shop they have provided the following fixed costs item along with their cost. After collecting the fixed cost item, I have calculated the depreciation cost under straight line method for the fixed assets used in this fast food shop:

| | Name of Items | Cost (TK) | Expected Useful Life | Annual Depreciation Rate % | Annual Depreciation Cost (TK) | Monthly Depreciation Cost (TK) |
|---|---------------------------------------|-----------|----------------------|----------------------------|-------------------------------|--------------------------------|
| 1 | Refrigerator | 50,000 | 10 years | 10 | 5,000 | 417 |
| 2 | Furniture | 210,500 | 20 years | 5 | 10,500 | 875 |
| 3 | Machinery | 150,000 | 5 years | 20 | 30,000 | 6,000 |
| 4 | CC TV Camera | 40,000 | 10 years | 10 | 4,000 | 334 |
| 5 | Other items (water mug, plate, spoon) | 10,000 | 2 years | 50 | 5,000 | 417 |
| 6 | Air Condition | 120,000 | 10 years | 10 | 12,000 | 1,000 |
| | Total | | | | | <u>TK 9,073</u> |

Table: Total Depreciation Cost of different fixed assets

Other fixed costs items that were identified from the collected information are:

| | Name of items | Amount (TK) |
|---|-------------------------------|-------------------|
| 1 | Rent of shop | 70,000 |
| 2 | Manager's salary (monthly) | 20,000 |
| 3 | Supervisor's salary (monthly) | 15,000 |
| 4 | Workers salary (monthly) | 10,000 |
| | Total | <u>TK 120,542</u> |

Table: Total Fixed Costs

So, total fixed cost is TK129, 615/- (Total depreciation costs and total other fixed costs; TK 9,073 & TK 120,542)

We have allocated the total fixed costs into each item of food that are produced by this business. The total numbers of items that are produced by this business are twelve. So, the allocation of fixed costs will be total fixed costs divided by 12:

Total Monthly fixed costs (TFC) per item = $TK129, 615/12 = TK10, 802$

In this business total number of burger sale per day is 50 pieces which includes 30 pieces of chicken burger and 20 pieces of beef burger. So the ratio of chicken burger and beef burger is 60:40. That is why, in terms of cost allocation the monthly variable cost per item has to be allocated according to their ratio-

Chicken burger fixed cost (monthly) = $(TK10802 * 60\%) = TK6482$

Per day chicken burger sale = 30 pieces

Monthly sales = $(30 \text{ pieces} * 30 \text{ days}) = 900 \text{ pieces}$

Fixed cost per pieces chicken burger $(TK6482/900 \text{ pieces}) = TK7.20$

| | Number of items: Chicken Burger | Cost (TK) |
|---|---------------------------------|-----------------|
| 1 | Burger Bun | 15 |
| 2 | Chicken Fry | 50 |
| 3 | Tomato | 1.20 |
| 4 | Cucumber | 1.96 |
| 5 | Onion | 0.96 |
| 6 | Lettuce Leaf | 0.70 |
| 7 | Tomato Ketchup | 4.40 |
| 8 | Mayonnaise | 7.00 |
| | Total Cost | <u>TK 81.18</u> |

Table: Total Cost of Raw Material for Chicken Burger

1) Burger bun = 15tk

2) Chicken fry = 50tk

3) Tomato - TK1.20 for two slices of tomato required for chicken burger

Weight of 1 slice tomato is 20gm

Per kg tomato price is TK30 according to current market condition.

The price of 1000 gm tomato is TK30, so the price of 20gm tomato is TK0.60

So the price of 2 slice is $(0.60*2) = TK1.20$

4) Cucumber - 24gm * 2 slice = 48gm or TK1.92 for two slices of cucumber required for chicken burger

1 slice of cucumber is 24gm

Per kg cucumber price is TK40 according to current market condition.

The price of 1000gm tomato is TK40, so the price of 24gm cucumber is TK0.96

So the price of 2 slice is $(0.96 * 2) = TK1.92$

5) Onion - 16gm * 2 slices = 32gm or TK0.96 for two slices of onion required for chicken burger

1 slice of onion is 16gm.

Per kg onion (Indian) is TK30 according to current market condition.

The price of 1000gm onion is TK30, so the price of 16gm onion is TK0.48

So the price of 2 slice is $(0.48 * 2) = TK0.96$

6) Lattice leaf - 10gm * 2 pieces = 20gm lettuce leaf required for chicken burger

1 piece of lattice leaf is 10gm.

Per kg cost is TK35 according to current market condition.

The cost of 1000gm lattice leaf is TK35, so the cost of 10gm lettuce leaf is TK0.35

So, the price of two pieces are $(0.35 * 2) = TK0.70$

7) Tomato ketchup - 20gm or TK4.40 required either for chicken burger

20gm of tomato ketchup is required per kg cost is TK220 according to current market condition.

So, the cost of 20gm is TK4.40

8) Mayonnaise - 20gm or TK7.00 required for chicken burger

Per kg cost is TK350 according to current market condition.

So, the cost of 20gm is TK7.00

Determining and allocation of variable costs:

Initially I have collected the variable costs items on monthly basis. After collecting them monthly basis, I have allocated them among all the items of this fast food shop. In this fast food shop there were twelve fast food items where the total variable costs have been allocated as part of cost allocation. Two items have been identified as variable costs item. These are electricity and cooking gas. Their allocation has been given in the following table:

| | |
|---|---|
| Total monthly electricity cost = TK60,000 | Per unit cost = TK60,000/12 = TK5,000/Month |
| Total monthly gas consume cost = TK32,000 | Per unit cost = TK32,000/10 = TK3,200/Month |

Table: Allocation of variable cost in twelve items

In this business total number of burger sale per day is 50 pieces which includes 30 pieces of chicken burger and 20 pieces of beef burger. So the ratio of chicken burger and beef burger is 60:40. That is why, in terms of cost allocation the monthly variable cost per item has to be allocated according to their ratio:

| | | |
|---|--|---------------------------|
| Chicken Burger | | |
| Per unit cost = TK60,000/12 = TK5,000/Month | Electricity cost = (TK5,000*60%) = TK3,000 | Electricity = TK3.33/unit |
| Per unit cost = TK32,000/10 = TK3,200/Month | Cooking gas cost = (TK3,200*60%) = TK1,920 | Gas = TK2.09/unit |

Total Cost for per piece of chicken burger:

| Costs | Amount (TK) |
|--------------------------|------------------------|
| Fixed Cost/Burger | 7.20 |
| Variable Cost/Burger: | |
| Raw Material Costs | 81.18 |
| Utility Costs: | |
| Electricity + Gas | 3.33+2.09 |
| Total Cost/Burger | TK94.00 (93.80) |

Selling Price:

$$\begin{aligned} \text{Selling Price/Burger} &= \text{Total Cost/Burger} + \text{Profitability (30\% of Total Cost/Burger)} \\ &= \text{TK94.00} + (30\% * \text{TK94.00}) \\ &= \text{TK120.00 (TK122.20 per Burger)} \end{aligned}$$

CVP Format Income Statement:

| Chicken Burger CVP Format Income statement For the Month Ended | | |
|---|-------------|-----------------|
| Account Details | Amount (TK) | Amount (TK) |
| Sales (TK120.00 * 900pieces) | | 108,000 |
| Less: Variable Expenses | | |
| Raw Material Costs (TK81.18/Burger * 900pieces) | 1,062 | |
| Utility Costs (TK5.42/Burger * 900pieces) | 4,878 | |
| | | (5940) |
| Total Variable Expenses | | |
| Total Contribution Margin | | 102,060 |
| Less: Fixed Expenses | | |
| Total Fixed Expenses (TK7.20/Burger * 900pieces) | | (6,482) |
| Net Income | | TK95,578 |

Contribution Margin:

$$\begin{aligned} \text{Total Contribution Margin} &= \text{TK102,060} \\ \text{Contribution Margin/Burger} &= \text{TK102,060}/900\text{pieces} \\ &= \text{TK113.40} \end{aligned}$$

Contribution Margin Ratio:

$$\begin{aligned} \text{Contribution Margin Ratio} &= (\text{TK108,000} - \text{TK5940})/\text{TK108,000} \\ &= 95\% \end{aligned}$$

The above example expresses the relationship between cost and profitability. The example also explained that how expenses change in relation to changes in sales determines the cost structure of a

business. The cost structure is stated in terms of fixed and variable expenses in the above example. It is necessary to classify the expenses as either fixed or variable if want to understand the profitability of a business. Classifying an expense as fixed or variable is determined by how a particular expense fluctuates with sales volume.

Fixed costs remain the same whether sales increase or decrease. Only when sales increase dramatically, do these costs increase. If the burger shop manager wants to know how their expenses fluctuate with sales volume, then they must understand unit costs. Because fixed costs don't change as sales volume changes, the fixed cost per unit changes. In the above example, burger shop has monthly fixed costs of TK 6,482 to produce 900 chicken burgers. The TK6, 482 stays the same whether they produces 200 burgers, 900 burgers or 1500 burgers.

Variable costs fluctuate in direct relation to sales volume. If sales increase, then variable costs increase. If sales decrease, then variable costs also decrease. Because variable expenses change directly as sales volume changes, the variable cost per unit remains the same.

The burger shop manager can estimate variable costs and fixed costs for productions levels in a relevant range. If the costs of one piece chicken burger is TK94.00 within a range of no less than 900 units. If the actual unit volume is less than 900 units, the purchased cost of materials increases sufficiently to make the assumed cost of TK94.00 per unit too low.

If they were to produce more than 900 pieces of chicken burger, it would need more new workers to produce them, which would require an additional wages or salary. Thus, the initial cost of the chicken burger is only valid for a range that stops at 900 units per month. Above that amount, a new unit range can be assumed for a different cost that assumes the inclusion of the cost of the new workers in the cost of the product.

If the burgers shop construct a manufacturing facility or put new service for facilitate the customers, which has a fixed cost to operate and maintain every month. However, if production levels exceed 900 units per month, then this fixed cost will increase, because of additional wear and tear on the facility.

V. METHODOLOGY:

I have conducted this research in a formal way and as a researcher I have no control over the variables in the sense of being able to manipulate them. I have developed a questionnaire to conduct the research under normal field conditions. Two types of questionnaires have been developed for identifying two types of purposes. These types are Non-Financial and Financial. Under the non-financial questionnaire I have tried to collect information about Menu Variety, Sitting Arrangement, Fair Pricing and Determination of Targeted Sales. The second type of questionnaire that has been developed was followed by non-probability sampling for conducting the survey. The questionnaire has been circulated among fifteen different types of small fast food business. Finally twelve small fast food businesses have been agreed to participate in the survey. The respondents have been selected according to their availability during normal business hour. The second type of questionnaire has been prepared with a five point Likert Scale ranging from 1= Strongly Disagree to 5= Strongly Agree. SPSS software has been used to analyze the outcome through descriptive analysis.

Correlation and coefficient analysis have been conducted to determine the relationship strength among the variables. For correlation and coefficient I have also analyzed the upper limit and lower limit. One sample T-Test with multiple regression has been conducted to test the hypothesis considering $H_0 =$ No Relationship between (cost, volume) and profitability.

VI. DATA ANALYSIS AND FINDINGS:

List of variables that have been used for analysis:

Variables under financial category:

V₁: Profitability affected by wrong determination of manufacturing cost

V₂: Determine and Allocate Variable Cost

V₃: Required Quantity of Sales

V₄: Product Pricing

Variables Entered/ Removed ^a:

The variable entered and removed in the regression analysis consists of dependent variable "Profitability". The **Model** column indicates the number of the model being reported. SPSS allows us to specify multiple models in a single regression command. The **Variables Entered** column shows the list of the independent variable specified. The column **Variables Removed** lists the variables that were removed from the current regression. Here no variables were removed. The **Method** column shows the method that is used by SPSS to run the regression. **Enter** means that each independent variable was entered in the usual fashion. Because "Enter" regression was requested, SPSS first tested a model with variables: technological

competencies, analytical competencies, technical competencies, leadership competencies, business competencies and interpersonal competencies.

| Variables Entered/ Removed ^a | | | |
|--|--|-------------------|--------|
| Model | Variables Entered | Variables Removed | Method |
| 1 | Product Pricing, Required Quantity of Sales, Determine and Allocate Variable Cost ^b | | Enter |
| a. Dependent Variable: Profitability effected by wrong determination of manufacturing cost | | | |
| b. All requested variables entered. | | | |

Model Summary ^B:

R is the square root of **R²** and is the correlation between the observed and predicted values of the dependent variable. **R²** is the proportion of the variance in the values of the dependent variable (Y) which can be explained by all the independent variables (Xs) in the equation together. This is an overall measure of the strength of association and does not reflect the extent to which any particular independent variable is associated with the dependent variable.

R² is a measure of how much of the variability in the outcome (**Profitability**) is accounted for by the predictors (**Product Pricing, Required Quantity of Sales, Determine and Allocate Variable Cost**). In the table **R²** value is 0.295 which means that **Product Pricing, Required Quantity of Sales, Determine and Allocate Variable Cost** is accounted for 29.50% of the variation in **profitability**. This suggests that the model is quite significant in explaining the variances. The significant result at $p < 0.398$ provides support for the relationship.

Adjusted R² is an adjustment of the R-squared that penalizes the addition of extraneous predictors to the model. Here the adjusted **R²** is 0.031 in this case the difference for the final model is 0.264 (0.295-0.031) or 26.40%. This shrinkage means that if the model were derived from the population rather than a sample it would account for approximately 26.40% less variance in the outcome.

Std. Error of the Estimate is 0.568. In general, here the standard error is neither low nor high and any predictions using this model will be good ones.

F value shows whether the equation as a whole is statistically significant in explaining Y. F value for the “Change Statistics” shows the significant level associated with adding the variable. The significant level for F value change statistics is 0.398.

| 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 | .543 ^a | .295 | .031 | .568 | .295 | 1.117 | 3 | 8 | .398 |
| a. Predictors: (Constant), Product Pricing, Required Quantity of Sales, Determine and Allocate Variable Cost | | | | | | | | | |

Analysis Of Variance (Anova):

ANOVA will assess the overall significance of our model. There are three variables that have been checked: **Regression, Residual and Total**. The total variance is explained by the independent variables (Regression) and the variance which is not explained by the independent variables (Residual). **Sum of Squares** is associated with the three sources of variance: **Regression, Residual and Total**.

| ANOVA ^a | | | | | | |
|--|------------|----------------|----|-------------|-------|-------------------|
| Model | | Sum of Squares | df | Mean Square | F | Sig. |
| 1 | Regression | 1.082 | 3 | .361 | 1.117 | .398 ^b |
| | Residual | 2.584 | 8 | .323 | | |
| | Total | 3.667 | 11 | | | |
| a. Dependent Variable: Profitability effected by wrong determination of manufacturing cost | | | | | | |
| b. Predictors: (Constant), Product Pricing, Required Quantity of Sales, Determine and Allocate Variable Cost | | | | | | |

df is the degree of freedom associated with the sources of variance. The total variance has N -1 degrees of freedom. **Mean Square** is calculated by dividing the sum of squares by their respective df.

F-statistic is the mean square (regression) divided by the mean square (residual). The **p-value** is compared to some alpha level in testing the null hypothesis that all of the model coefficients are 0. By using the

ANNOVA we have found that there was a significant effect of Product Pricing, Required Quantity of Sales, Determine and Allocate Variable Cost on profitability at the $p < .398$ level { $F(3, 11) = 1.117, p < .001$ }.

F-ratio represents the ratio of the improvement in prediction that results from fitting the model (labeled 'Regression'), relative to the inaccuracy that still exists in the model (labeled 'Residual' in the table).

Coefficients^A

This table indicates the coefficients of multiple regressions. It shows in detail the beta (standardized and un standardized) value of various independent variables and its associated significance value.

The **Model** column represents three independent variables **Product Pricing, Required Quantity of Sales, Determine and Allocate Variable Cost.**

B column shows the values for the regression for predicting the dependent variable from the independent variable. The **B** value for **Determine and Allocate Variable Cost** is 0.088; **Required Quantity of Sales** is 0.858 and **Product Pricing** is -0.185. **Std. Error** shows the standard errors associated with the coefficients and **Beta** (standardized coefficients) measures how strongly each predictor variable influences the criterion variable. **T and Sig. (p)** values give a rough indication of the impact of each predictor variable a big absolute **t** value and small **p** value suggest that a predictor variable is having a large impact on the criterion variable. **T and Sig. (p)** value give a rough indication of the impact predictor variable a big absolute **t** value and small **p** value suggest that a predictor variable is having a large impact on the criterion variable. The bigger betas are associated with the larger **t**-values and lower **p**-values.

| Coefficients ^a | | | | | | | | | | | |
|---------------------------|--------------------------------------|------------------------------|------------|---------------------------|-------|------|---------------------------------|-------------|--------------|---------|-------|
| Model | | Un-standardized Coefficients | | Standardized Coefficients | t | Sig. | 95.0% Confidence Interval for B | | Correlations | | |
| | | B | Std. Error | Beta | | | Lower Bound | Upper Bound | Zero-order | Partial | Part |
| 1 | (Constant) | 1.000 | 2.953 | | .339 | .744 | -5.811 | 7.811 | | | |
| | Determine and Allocate Variable Cost | .088 | .250 | .110 | .354 | .732 | -.487 | .664 | .146 | .124 | .105 |
| | Required Quantity of Sales | .858 | .603 | .429 | 1.422 | .193 | -.533 | 2.249 | .455 | .449 | .422 |
| | Product Pricing | -.185 | .232 | -.249 | -.798 | .448 | -.719 | .349 | -.337 | -.272 | -.237 |

a. Dependent Variable: Profitability effected by wrong determination of manufacturing cost

95.0% Confidence Interval for B shows the 95% confidence intervals for the coefficients. The confidence intervals are related to the **p**-values such that the coefficient will not be statistically significant if the confidence interval includes 0. These confidence intervals can help us put the estimate from the coefficient into perspective by seeing how much the value could vary. **Correlation** is a statistical measure that indicates the extent to which two or more variables fluctuate together. A positive correlation indicates the extent to which those variables increase or decrease in parallel; a negative correlation indicates the extent to which one variable increases as the other decreases. **Determine and Allocate Variable Cost and Required Quantity of Sales** has positive correlation where as **Product Pricing** has negative correlation with other variables.

$$Y_i = \beta_0 + \beta_1 x_i + \beta_2 x_{ii} + \beta_3 x_{iii} + \epsilon_i$$

Profitability (Y_i) = β₀ + β₁ Determine and Allocate Variable Cost (x_i) + β₂ Required Quantity of Sales (x_{ii}) + β₃ Product Pricing (x_{iii}) + ε_i

T-Test:

A **t-test** is an analysis of two population's means through the use of **statistical** examination; analysts commonly use a **t-test** with two samples with small sample sizes, **testing** the difference between the samples when they do not know the variances of two normal distributions. In this analysis I have used One-Sample Statistics where the mean, Std. Deviation and Std. Error Mean represents statistics of the variables. In the One-Sample Test I have found a high mean difference in profitability and required quantity of sales.

| One-Sample Statistics | | | | |
|---|----|------|----------------|-----------------|
| | N | Mean | Std. Deviation | Std. Error Mean |
| Profitability effected by wrong determination of manufacturing cost | 12 | 4.17 | .577 | .167 |
| Determine and Allocate Variable Cost | 12 | 3.17 | .718 | .207 |
| Required Quantity of Sales | 12 | 4.08 | .289 | .083 |
| Product Pricing | 12 | 3.33 | .778 | .225 |

| One-Sample Test | | | | | | |
|---|----------------|----|-----------------|-----------------|---|-------|
| | Test Value = 0 | | | | | |
| | t | df | Sig. (2-tailed) | Mean Difference | 95% Confidence Interval of the Difference | |
| | | | | | Lower | Upper |
| Profitability effected by wrong determination of manufacturing cost | 25.000 | 11 | .000 | 4.167 | 3.80 | 4.53 |
| Determine and Allocate Variable Cost | 15.284 | 11 | .000 | 3.167 | 2.71 | 3.62 |
| Required Quantity of Sales | 49.000 | 11 | .000 | 4.083 | 3.90 | 4.27 |
| Product Pricing | 14.832 | 11 | .000 | 3.333 | 2.84 | 3.83 |

Data Analysis And Findings Under Non-Financial Category:

List of variables that have been used for analysis:

Variables under non-financial category:

V₁: Menu Variety

V₂: Sitting Arrangement

V₃: Dining Service

V₄: Fair Pricing

V₅: Determine Targeted Sales

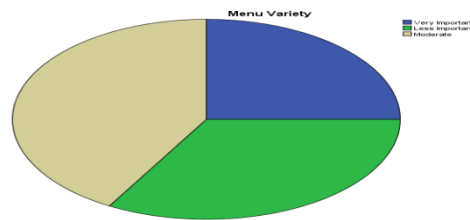
For analyzing the non-financial category, I have used simple statistical tools like mean, standard deviation and standard error of mean. Variable wise mean, standard deviation and standard error of mean are mentioned in the statistics table:

| Statistics | | | | | | |
|--------------------|---------|--------------|---------------------|----------------|--------------|--------------------------|
| | | Menu Variety | Sitting Arrangement | Dining Service | Fair Pricing | Determine Targeted Sales |
| N | Valid | 12 | 12 | 12 | 12 | 12 |
| | Missing | 0 | 0 | 0 | 0 | 0 |
| Mean | | 2.17 | 1.33 | 1.25 | 2.17 | 1.33 |
| Std. Error of Mean | | .241 | .142 | .131 | .297 | .142 |
| Mode | | 3 | 1 | 1 | 3 | 1 |
| Std. Deviation | | .835 | .492 | .452 | 1.030 | .492 |

Menu Variety:

41.7% small fast food businesses said **Menu Variety** is neither very important nor less important. Three parameters have been used for determining the importance of menu variety in small fast food business. These are very important, less important and moderate.

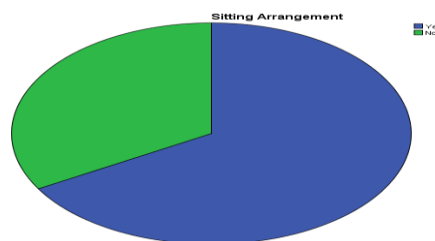
| Menu Variety | | | | | |
|--------------|----------------|-----------|---------|---------------|--------------------|
| | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | Very Important | 3 | 25.0 | 25.0 | 25.0 |
| | Less Important | 4 | 33.3 | 33.3 | 58.3 |
| | Moderate | 5 | 41.7 | 41.7 | 100.0 |
| | Total | 12 | 100.0 | 100.0 | |



Sitting Arrangement:

66.7% small fast food businesses said **Sitting Arrangements** have effect on sales. Two parameters have been used for determining the effect of sitting arrangements on sales. These are yes and no.

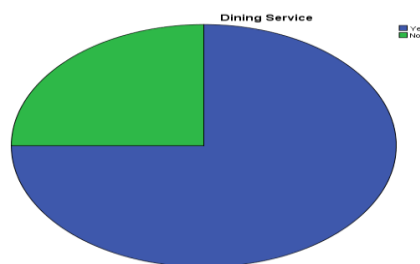
| Sitting Arrangement | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---------------------|-------|-----------|---------|---------------|--------------------|
| Valid | Yes | 8 | 66.7 | 66.7 | 66.7 |
| | No | 4 | 33.3 | 33.3 | 100.0 |
| | Total | 12 | 100.0 | 100.0 | |



Dining Service:

75% small fast food businesses said **Dining Service** has impact on the fast food shops sales. Two parameters have been used for determining the effect of dining service on sales. These are yes and no.

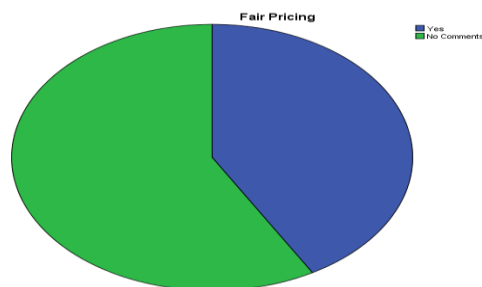
| Dining Service | | Frequency | Percent | Valid Percent | Cumulative Percent |
|----------------|-------|-----------|---------|---------------|--------------------|
| Valid | Yes | 9 | 75.0 | 75.0 | 75.0 |
| | No | 3 | 25.0 | 25.0 | 100.0 |
| | Total | 12 | 100.0 | 100.0 | |



Fair Pricing:

Fair Pricing is a controversial issue in any business. Every business will say positively about fair pricing of their product or services. In our survey when we have asked about this issue, the businessmen did not pass any comments. We asked them about the relationship between fair pricing and profitability and 58.3% did not pass any comments regarding this issue. Two parameters have been used for determining the effect of dining service on sales. These are yes and no comments.

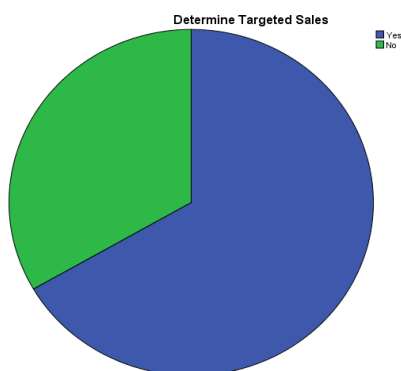
| Fair Pricing | | Frequency | Percent | Valid Percent | Cumulative Percent |
|--------------|-------------|-----------|---------|---------------|--------------------|
| Valid | Yes | 5 | 41.7 | 41.7 | 41.7 |
| | No Comments | 7 | 58.3 | 58.3 | 100.0 |
| | Total | 12 | 100.0 | 100.0 | |



Determine Targeted Sales:

66.7% small fast food businesses said they determine the targeted sales in advance. Two parameters have been used for determining the effect of dining service on sales. These are yes and no.

| Determine Targeted Sales | | | | | |
|--------------------------|-------|-----------|---------|---------------|--------------------|
| | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | Yes | 8 | 66.7 | 66.7 | 66.7 |
| | No | 4 | 33.3 | 33.3 | 100.0 |
| | Total | 12 | 100.0 | 100.0 | |



V. LIMITATIONS OF THE STUDY:

- As the fast food industry is very large, so it is difficult to cover whole industry at a time. That is why this research has focused on only small fast food businesses.
- The sample size that has been determined could be more. Most of the businesses are not interested to disclose their financial policies publicly. That is why I could not provide details financial information for research purpose.
- Fast food industry is a large and booming industry in Bangladesh. A simple recommendation and conclusion cannot be given based on only one section of the whole industry.
- Fast foods shops are operating their businesses in almost every small and large city in Bangladesh. I have covered some location in Dhaka city and failed to cover whole Bangladesh.
- Limited numbers of journal publication is available online that hinders to construct most informative literature review.

RECOMMENDATIONS:

For conducting a depth research, we must have to cover the whole industry. So it would be a very good idea, if we take sample from small, medium and large fast food shops then it will be more authentic. As said earlier, most of the businesses are not interested to disclose their financial information which is a great barrier to conduct an authentic research. In the future, before conducting a research we can take permission from business authority which will add value to further research. For conducting wide range and variety research we have to visit fast food shops in different location of Bangladesh which requires funding. So for further research in this industry we have to arrange budget for visiting different location in Bangladesh.

In the future we should collect financial information for determining the relationship among cost, volume and profitability. Developing relationship based on categorical variables limits the outcome of the research where as actual relationship can only be determined on the basis of real life financial information. Number of variables could be more for analyzing both financial and non-financial side of a business.

VI. CONCLUSION:

This research will help academicians and accounting professionals to think in depth about the relationship between cost and profitability. There are lots of cost item but not all of them have direct impact on profitability. If a company hires skilled employee or trained their employee to be skilled then their output will be error free and efficient. Although training and development has cost itself but the output would be more than investment. Cost of product's development is a negligible issue for the company. A new product development through intensive research leads a quality product with new horizon for the customer or end users. This creates competition in the market and increases market share. That is why; every company should invest on product development research for market expansion. Although cost is associated with research but a unique product or service can leads to enormous profitability for a company.

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