



The Effect of Break-Even-Point Analysis in Decision Making in some selected Block Industries within Kaduna Metropolis

ZannaDalatu Gubio^{1*}, Lateef Olumide Mustapha², Samuel Eniola Agbi³

^{1,2,3} Department of Accounting, Faculty of Management Sciences, Nigerian Defence Academy, Kaduna, Nigeria

¹ Z.D. Gubio

² L.O. Mustapha

³ S.E. Agbi

*Corresponding Author

Abstract

Most well established organisations uses different tools of management accounting techniques for decision making, among which is the Break-even point analysis. However, there is little or no evidence to suggest that some small and medium size enterprises such as block industries apply the concept of Break-even in their profit planning. This study therefore, provides a critical evaluation of the effect of breakeven point (BEP) analysis in decision making in some selected Block Industries within Kaduna Metropolis. Breakeven point proxied by Selling Price, Sales Volume and Cost, while decision making was proxied by Profit. The sample of the study was drawn from 42 Block factories within Kaduna Metropolis. The researcher collected data by administering questionnaires along with interviews for easy analysis of data. Multiple regression technique was employed in the analysis of data with the help of Statistical Package for Social Sciences (SPSS) version 23 package. The study found that Cost has negative significant effect on Profit at 1% level of significance, while Sales Volume has positive significance effect on Profit of Block factories within Kaduna Metropolis at 5% level of significance. However, Sales has positive insignificant impact on Profit. The study concluded that Cost and Sales Volume have significant impact, while Selling Price has insignificant impact on profit. The study recommended that, Block industries should use breakeven point analysis as a main tool profit planning because of its impact, efficiency and accuracy in the rationalization of profit maximisation objective.

Keywords: Break Even Point, Selling Price, Volume, Cost, Profit.

Received 06 May, 2022; Revised 18 May, 2022; Accepted 20 May, 2022 © The author(s) 2022.

Published with open access at www.questjournals.org

I. Introduction

In a free enterprise structure, no privately owned corporate entity can afford to make less than a healthy profit for any considerable period of time. The survival of a business, therefore, depends on the capability of the management to earn, at least, a healthy profit for the business. In order to achieve this, under prevailing competitive conditions, the management of a business has to provide for suitable financial planning and control. In other words, management must be able to efficiently and effectively plan its profit performance. To do this religiously, management has developed and adopted various tools. One of these tools is break-even analysis.

Break-Even-Point is not an end target by itself, but it is one of the important tools used to measure the profitability of a firm. Break-Even-Point can be defined as the point where total revenue equals total variable and fixed expenses (Garrison, 2012). Due to great significance of Break-Even-Point in decision making, the essential focus of this research study was on the effect of Break-Even-Point in decision making in some selected Block Industries in Kaduna Metropolis.

II. Study Problem

The term “break-even” has become a part and parcel of the standard vocabulary of economists, accountants and managers in general. Each of these three classes of people have contributed in no small measure to the increasing popularity of this subject in recent history. In fact, it may be said that, today, the best

discussions on break-even analysis are to be found in economics, accounting and management books and journals. But, although a great deal of attention has been given to this subject, there is still some vagueness as to what the area involves. To many individuals, when break-even analysis is mentioned, the first thing that comes to mind is a simple cross-over chart, indicating total sales revenue and total costs, with the cross-over point representing the break-even point. In reality, break-even –analysis is more than the mere determination of the volume level at which revenue equals to cost. Rather, it exposes the effect on profits resulting from the interplay of such factors as prices, costs and volume.

The study problem arises out of the impression that the Block Industries in Kaduna Metropolis may not use Break-even Point analysis in their Decision making which will eventually affect their primary objectives of growth.

III. Study Objectives

The main objective of this study was to highlight the effect of Break-Even-Point in decision making in the selected Block Industries within Kaduna Metropolis.

This main objective can be divided into the following sub-objectives

- 1: To determine the effect of Selling Price on Profit in the selected Block Industries within Kaduna Metropolis.
- 2: To evaluate the effect of Cost of Production on Profit in the selected Block Industries within Kaduna Metropolis.
- 3: To ascertain the effect of Sales Volume on Profit in the selected Block Industries within Kaduna Metropolis.

IV. Hypothesis

H0: The selected Block Industries do not use Break-Even-Point in decision making.

This main hypothesis can be divided into the following sub-hypotheses

- 1: There is no significant statistical relationship between Selling Price and Profit in the selected Block Industries within Kaduna Metropolis.
- 2: There is no significant statistical relationship between Cost of Production and Profit in the selected Block Industries within Kaduna Metropolis.
- 3: There is no significant statistical relationship between Sales Volume and Profit in the selected Block Industries within Kaduna Metropolis.

V. Significance of the Study

Break-even Point analysis has great scope in various managerial decisions making. It assists management in determining the quantity of products to be produced to attain desired profits, the quantity of products to be produced at a minimum threshold level, attaining desired profits under different cost and volume relationship. Break-even analysis helps the business offers to its customers in the market. This helps the firms to focus more on profitable products and services as compared to other ones. It also helps the firm to understand the impact of any variance in its sales volume, due to any reason, on the profits. The management understands the amount of sales that the firm can afford to lose due to any contingency, without falling below its breakeven.

Break-Even Point analysis also helps the firm to understand the level of fluctuations it can afford in its selling price. Whenever firms decrease their selling price to increase their sales, they must know the new level of sales they must meet to sustain the desired profits. The firms must also know the bare basics price(s) that must be charged for its products or services from its customers. Hence, the researcher has undertaken this area to know cost volume, profitability position of Block Industries in Kaduna Metropolis.

The results of this research study may be useful to improve the Decision-Making process of the selected Block making Factories and other companies in the same industry.

2.0 Conceptual Review

2.1 Definition of Break Even Point

Breakeven point is a condition where the company does not make a profit and does not suffer losses. According to Noor (in Razak et al., 2015: 2) breakeven point analysis is the main return point or level of production where the company does not experience losses but also does not make a profit. Break-even point analysis is useful to find out the break-even point of the company where revenue equals the costs incurred by the company. According to Martono and Harjito (2015) break-even point analysis or break-even analysis is an analytical technique to study the relationship between costs, profits, and sales volume.

Based on some of the opinions above, it can be argued that the break-even point analysis is a tool used to determine the break-even point of the firm, where the firm does not experience losses and does not make profits. Break-even point analysis can be described as the minimum revenue that must be achieved by the firm in order to obtain the targeted profit.

2.2 Definition of Cost-Volume Profit Analysis

Adenji (2008) states that cost-volume-profit analysis are predetermined costs, target costs or carefully pre planned costs which management endeavors to achieve with a view to establishing or attaining maximum efficiency in the production process. According to him, cost-volume-profit analysis is cost plans relating to a single cost unit. Because cost-volume profit analysis purports to be what cost should be, any deviation represents a measure of performance. The predetermined costs are known as cost-volume-profit analysis and the difference between the cost-volume-profit analysis and actual costs are known as a variance.

Drury (2000) defines cost-volume-profit analysis as predetermined cost; they are cost that should be marred under efficient operating conditions. The cost-volume profit analysis may be determined on a number of bases. The main uses of cost-volume-profit analysis are in performance measurement, control, stock valuation and in the establishment of selling prices. Cost-volume-profit analysis is a target cost which should be attained.

Cost- volume- profit analysis, according to Glautier et al (2001), is the systematic examination of the inter-relationship between selling prices, sales and production volume, cost, expenses and profits. The above definition explains cost-volume profit analysis to be a commonly used tool providing management with useful information for decision making. Cost volume-profit analysis will also be employed on making vita and reasonable decision when a firm is faced with managerial problems which have cost volume and profit implications.

Cost- volume- profit analysis according to Hilton R.W (2002:230) is a mathematical representation of the economics of producing a product. The relationship between a products revenue and cost function expressed within the cost-volume-profit analysis are used to evaluate the financial implication of a wide range of strategic and operational decisions.

According to Garrison et al (2003) cost-volume-profit analysis is a study of inter-relationship between the following factors: princes of products, volume or level of activity, per-unit variable cost, total fixed cost, mix of products sold. Also state further the cost-volume-profit analysis is a key factor in many decisions including choice of products lines, pricing of product, marketing strategies and utilization of productive facilities.

Basic Elements of C-V-P Analysis

The Basic elements of C-V-P analysis are cost, volume and profit. These three fundamental elements determine the value creation for the business in the long run. A good understanding of cost and volume helps the business to manage its profit efficiently. Let us understand the basis of these three fundamental elements of C-V-P concept.

2.2.1 Cost

The first important business element is cost. Every business incurs certain cost initially and also as it carries out its business. These costs are the expenses related type making the product or providing a service.

2.2.2 Volume

The second most important element of the business is volume. I.e., how much it will produce and sell. The business must know beforehand how much to sell in order to determine how much to produce.

2.2.3 Profit

The last element is the profit of the business. A business must know how much a profit it has generated by delivering a certain number of products and services to the customers. Generally, the profit is determined as selling price of the product less cost of manufacturing the product.

Principles and Assumption of Cost-Volume-Profit Analysis

Underlying the operation of cost-volume-profit analysis is a principle which states that “at the lowest level of activity cost exceed income but as activity increases income rises faster than cost and eventually the two amount are equal, after which income exceed cost until diminishing returns bring cost above income once again. This principle describes cost-volume-profit analysis with curvilinear. Cost and revenue curves which thought theoretically sound lack practicability. Accountant found the need to bring in additional information relating to cost behavior and sales policy, this was to ensure that practical model be develop out of this principles.

The followings are the underlying assumptions of cost-volume profit analysis according to Horngen et al (2006)

- The behavior and revenues is linear.
- Selling price is constant.
- All cost can be divided in to their fixed and variable element.
- Total fixed cost remains constant.
- Total variable cost is proportional to volume.
- Volume is the only drive of cost.
- Prices of production inputs (e.g. materials) are constant.

Methods of Cost-Volume-Profit Analysis

There are two main approaches used in analysis of cost-volume-profit.

They include:

- The Graphical Approach
- The Algebraic Approach

The Graphical Approach

The cost-volume-profit graph can be very useful because it highlighted cost-volume-profit relationship over wide range of activity and give managers a perspective that can be obtained in on other way. Such graph is referred to as preparing a break even chart. This is correct to the extent that breakeven point is clearly shown on the graph. Garrison et al (2003).

The Profit Graph

This is another approach to cost-volume-profit graph. It is sometime preferred by some managers because it focuses more directly on how profit change with changes in volume. It has the added advantage of being easier to interpret than the traditional approach. It has the disadvantage of not showing as clearly how cost are affected by changes on the levels of sales.

The Algebraic Approach

The issues involved on this approach are the putting of marginal income statement format in formula, the incorporation of the contribution concept into the marginal costing income statement formula and the mathematical arrangement, re-arrangement and evaluation of some of the basic cost –volume-profit factors. (unit selling price, unit variable cost' fixed cost' sales volume). The marginal income statement employs the marginal costing technique where too much attention may be given to variable costs at the expense of disregarding fixed costs; in the long run fixed cost must be recovered.

The formulae and ratios that constitute then algebraic approach include the following;

- The net income ratio
- The contribution margin equation
- The variable cost ratio
- The contribution margin ratio
- The tax adjusted ratio

The Net Income Equation

This is a form of marginal costing statement used in processing cost-volume-profit data. Marginal costing differentiates between fixed costs and variable cost. In decision making, marginal costing is used simply because fixed cost is considered as a sunk cost or historical cost which is incurred whether profit is made or not.

The formula is stated thus;

$$NI = S - VC - FC$$

This can be regarded as;

$$S = VC + FC + NI \text{ Where:}$$

S = sales

VC = variable cost

NI = Net income

At break-even point, the equation changes because at that point, net income is zero, (no profit or loss). Therefore

$$s = \frac{F}{S - V}$$

The net income includes the break-even point, margin of safety and profit and loss at a given level of activity and it is computed thus:

$$IN = S_n - V_n - F_n$$

Required quality to be produced and sold to obtain a target income; in order to compute the quality required to be manufactured and sold to obtain a target income this equation must be used:

$$Q = \frac{FC + NI}{CM}$$

CM

Where: $CM = S - V$. Garrison (2003)

The Contribution Margin Equation

Contribution margin is the amount by which revenue exceed the variable cost of producing that revenue. Contribution margin per unit is the different between selling price and variable cost per unit. Horngren et al (2006). Contribution margin is very important in decision making and it states that the planner ought to think in terms of contribution margin rather than in terms of absolute profit. It should be noted that each additional unit

sold of a particular product contributes to a margin towards profit. The contribution margin equation could be stated thus

$$Cm = S - V$$

Where:

CM= contribution margin

S= sales

V= variable cost

In contribution margin approach break-even point is calculated as

$$\frac{FC}{CM}$$

CM

Sales unit to earn a desired profit to be

$$\frac{FC + \text{Target profit}}{CM}$$

CM

The Margin of Safety Equation

Margin of represents the difference between break-even point and budgeted activity level. It indicates how much sales may decrease before a company will suffer a loss. Adeniji (2004). The formula for calculating margin of safety is:

a. Most (unit) = Budgeted unit – Break –even Point (unit).

b. Most (sales volume) = Budgeted sales – Break-even point (Sales volume)

The Contribution Margin Ratio

This is the ratio of contribution to a particular sale value is describe as contribution margin ration. Also referred to as profit-volume ratio. It is designed to measure the level of contribution derivable from a specific amount of sales. It will be determined as follows.

a. $CMR \text{ (unit)} = \frac{\text{Selling price} - \text{Variable cost per unit}}{\text{Selling price}}$

Selling price

b. $CMR \text{ (Total)} = \frac{\text{Total sales} - \text{Total variable cost}}{\text{Total sales}}$

Total sales

c. $CMR = \frac{\text{fixed cost} + \text{profit}}{\text{Contribution} + \text{variable cost}}$

Contribution + variable cost

Note: - This occurs where selling price is completely omitted.

d. $CMR = \frac{\text{change in profit}}{\text{Changes in sales volume}}$

Changes in sales volume

Uses of Cost-Volume-Profit Analysis

Besides providing management with general information on the cost-volume-profit relationship of their firms, accountant can be also use it to provide management with useful information necessary for selling, certain planning, control and special decision problems. The decision areas where this analysis is done include: - profit planning budgetary control, control, product replacement, pricing decision, selecting of distribution channels, setting volume, sensitive retain on investment target, entry into foreign marking performance measurement. (Meigs and Meigs ,1996)

Problems of Cost-Volume-Profit Analysis

Regardless of the uses and the estimated benefit of cost-volume-profit analysis to the management of a firm in various areas, there are a lot of factors which affect the use and validity of cost-volume-profit analysis labour specialization and standardization. In other words, manufacturing can be described as changing raw materials into finished goods.

- Consumer goods
- Industrial goods

Consumer Goods: Consumer goods are goods that are ready for consumption after its production. These goods are bought from retail stores for personal, family or household use. They differentiated on basis of durability. Durable goods are products that have a long life such as furniture garden tools etc. Non – durable goods are those that are quickly use up or worn out or can become outdated such as food items, school supplies etc. Consumer goods can also be grouped into sub-categories on the basis of consumer buying habits. Convenience goods are items that buyers want to buy with less amount of effort, that is as conveniently as possible as possible. Most of these goods are low value that are frequency purchased in small quantities e.g. candy bars, soft drinks, newspapers Shopping goods are purchased only after the buyers compares the product of more than one store or looks at more than one assortment of goods before making a deliberate buying decision. They are of higher value than convenience goods they are infrequently and are durable. Price, quality, style, color are typical factors for buying them e.g. lawn movers, bedding, camping equipment etc. Specialty goods are items that are

unique or unusual—at least in the mind of the buyer. Buyers know what they want and are willing to exert considerable effort to obtain it. Such goods include wedding dresses, antiques, fine jewelries, electronics, automobiles e.t.c. (Kalu et al 2004).

Industrial Goods: industrial goods are products that firms purchase to make other products, which they later sell. Some are used directly in the production of products for resale, and some are used indirectly goods are classified on the basis of their use and they include: Installations are major capital items that are typically used directly in the production of goods, some installations such as convey or systems, robotics equipment and machine situations others like stamping machines large commercial ovens are built to a standard design but can be modified to meet individual requirement.

Raw Materials are products that are purchase on their raw state for the purpose of processing them into consumer or industrial goods e.g. are iron, ore, crude oil, diamond, copper, wheat, leathers, some are converted directly into another consumer product while others are converted into an intermediate product to be resold for use in another industry.

Accessory Equipment are capital goods that are less expensive and have short life span e.g. hand tools, compacted desk calculators, forklifts, typewriters etc. Fabricated parts are items that are purchased to be placed in the final product without final processing. Fabricated materials on the other hand require additional processing before being placed in the end products. E.g. are batteries, sun roofs, spark plugs, steel, upholstery fabric e.t.c. Industrial supplies are frequently purchased expense items. They contribute directly to the production the production process. They include computer paper light bulbs, lubrication oil, cleaning and office supplies etc. Kalu et al (2004)

2.3 Empirical Review

Cost-volume-profit analysis and decision making in the manufacturing industries of Nigeria by Ihemeje, Okerefor and Bashir (2015). This study determined the effect of cost-volume profit analysis in the decision making of manufacturing industries. The study combined both survey research and longitudinal research design. Both primary and secondary data were used for collection. They were analyzed using regression and correlation techniques. The results revealed that the sales value of a product and the quantity of the product manufactured has a positive effect on profit made on the product, also that there is a significant relationship between the cost of production and profit. The reorder and economic order quantity were also determined as a base for assessing decision making opportunities. Based on the result, the researcher recommends that manufacturing industries should always adopt cost-volume profit analysis in their decision making. The study uses general manufacturing Industries as domain rather than specific industry.

Analysis of break-even point in CV. Bata Cikarang Indonesia by Jamaludin (2018). The goal is to find out the performance of CV Bata Cikarang seen from the company's Break Event Point. The research method is Field Research by visiting research objects and conducting interviews, and Library Research by exposing existing data in the form of Balance Sheet and Profit and Loss reports, and sales of data in the form of quantitative data and in the form of descriptive. Break Event Point analysis is performed to determine the company's financial performance, can also be used as a reference in making decisions that affect the company's future. As for the results in 2017 the BEP unit is 1,055,194 and the rupiah BEP is IDR 422,077,922 and 2018 the BEP unit = 1,027,397.26 and the IDR BEP is IDR 462,392,108. This study mainly focuses on mathematical computation of different components of Cost-Volume-Profit analysis rather than assessing the relationship between the variables.

Break – even analysis of MRI unit in a Tertiary Care Academic Institute by Kumar (2018). To analyze the costs of MRI scanner in the Teaching Super-Specialty Institute. To evaluate the Break-even analysis and to calculate the break-even point. The study was conducted in a Tertiary Care Academic Institute, costing method was applied empirically to assess the cost in performing a MRI scan and carried out the Break-Even analysis. The results show that the total cost for operating the MRI equipment was Rs.19788186 (US\$291184.26), an average of 23 scans taken in a day. The revenue collection through MRI diagnosis was Rs.31494441(US\$ 463442.45) in the study year. 7967 scans were performed during the year. The revenue obtained through a scan MRI was Rs.3953.11 (US\$58.19). The BEP of MRI facility was 7830.7. The study concluded that this methodology is beneficial to health care managers in identifying the profit/loss from MRI scanner. The results indicate that the MRI unit was working with profit. It was found that the total number of patients is gradually increasing for MRI scan; the MRI scanning unit had already reached the break-even point. This study is mainly on computation of Break-even point in Rs. and in Units, it does not test the relationship between the variables.

Application of Cost-Volume-Profit Analysis in Decision-Making by Oanh, Thuan and Cong (2020). The paper aims to examine the application of cost-volume-profit (CVP) analysis by public universities in Vietnam. Research samples were collected in 2018 and 2019 by surveying Vietnamese public universities. After collection, the data is synthesized by excel file, conformity check, data cleansing and data analysis on SPSS software by tools such as Frequency statistics, price statistics, and means. The results show that: (1) universities

used the CVP analysis in decision-making, (2) information related to the CVP analysis used for decision-making by administrators remained simplistic and lacked cost-control details, and (3) the application of the CVP analysis by university administrators for decision-making was neither comprehensive nor coordinated. The findings also show that, given the current conditions in Vietnam, increasing the governance in public universities is essential, as is contributing to reducing costs, increasing universities' income, providing the best service to students, and improving the quality of training. The study calls for the flexible application of the CVP analysis, which will provide information to help managers at Vietnamese public universities make the best decisions. The study was conducted in a tertiary Institution in Vietnam and cannot be use to generalized its findings with Block Industries in Nigeria.

The effect of using break-even-point in planning, controlling and decision making in the industrial Jordanian companies by Alnasser, Shabanand Al-Zubi(2018). This research study aimed to figure out the effect of using breakeven point in planning, controlling, and in the decision-making process, in the Jordanian industrial companies. The study sample of the study was formed out of 54 employees in the accounting departments in the Jordanian industrial companies. The study found out that, the most of the Jordanian industrial companies are using break-even point in the planning, controlling and decision-making, and there is a statistical significant relationship between the use of the break-even point and successful planning, control and decision-making in the Jordanian industrial companies. The study has recommended that, companies should use breakeven point as a main tool of decision-making and planning oversight because of its impact, efficiency and accuracy in the rationalization and control decisions. This study was conducted in Jordan and the proxies for the dependent variables differs from the focus of this current study.

Producers' make or buy decision and business shutdown: An evaluation of choice in textile industry by Kenneth, Sunday, Nwajiuba, Osanebi and Ezemoyih (2019). | The study evaluated the producers' make or buy decision and organizational shutdown in the textile industry as a means of resolving the issues. Descriptive survey research design used and the population consisted of 12 active textile companies with 714 management staff. 6 textile mills with 403 staff representing 50% of the population were used as sample size. The validity and reliability of the instrument were established. Primary data collected were analyzed using descriptive and regression analysis method at 5% level of significance. The result obtained concluded that the sub-variables of the independent—cost, capacity and quality control have significant impacts on Nigerian textile mills closure ($R = .776$, $R^2 = .721$, $p < .05$; $R = .702$, $R^2 = .683$, $p < .05$; $R = .658$, $R^2 = .635$, $p < .05$). The study recommended that instead of the complete shutdown of the textile mills, management of such organizations should have resort to buying from outside suppliers to meet customers demand and survive, maintain their staff, save investors' fund and contribute their quota to the economy. The decision variables differ from the focus of this research.

Breakeven point and incremental analysis in decision making of lease-purchase option of heavy equipment at nickel lateritic ore mining by Rini, Aryanti and Nur (2017). The data used were costs, data company's production and price data from factors that affected the heavy equipment operation. Production was analyzed by using breakeven point analysis, whereas for deciding on leasing or purchasing was using incremental analysis and sensitivity analysis. Based on data processing and analysis, it was indicated that laterite nickel ore production in 2012-2015 would still be in a state of breakeven. Estimation results of production in 2016-2020 to maintain the safety limit production showed that production of nickel laterite ore would also still be in the breakeven point. Based on the analysis of incremental and sensitivity, when the heavy equipment lifetime lasted for five years, the procurement of heavy equipment by purchasing was more efficient compared to the lease option. This study uses secondary data source as oppose to the primary data source used in this current research.

Cost volume profitability analysis - an empirical study with reference to Salem Steel Authority of India Limited by Tamilnadu and Kavitha (2018). In order to fulfill the objectives, the researcher has taken ten-year financial data from the period of 2005-2006 to 2014-2015 in the form of secondary data. From the results, a PV ratio from 2005-06 to 2014-15 are gradually increased and also breakeven point shows a satisfactory level with respect to all the level of sales volume in all ten years. Therefore, it is concluded that CVP analysis is used to escalate production capacity and utilize advanced technology to reduce cost of production and wage cost for the purpose hiking the profitability, volume, not only against the investment, but also from the investor's return point of view.

Breakeven and profitability analyses in marketing management using R software by Khalid, Lewis, Inder and Rajiv (2011). This article evaluates breakeven and profitability analyses for firms in perfectly competitive and imperfectly competitive markets. The conceptual and practical methods for profitability analysis are presented, and R, free mathematical and statistical software, is used to analyze various situations to guide marketing managers in their decision making. The use of this free and powerful software to facilitate analysis and decision making should empower the greatest number of decision makers all over the world. The role of product characteristics in determining product demand, pricing, and market shares is also presented here.

2.4 Theory of Choice

The theory of choice also known as decision theory is the study of reasoning underlying management or agent's choices (Steele & Stefansson, 2015). Decision theory is a multidisciplinary approach employed to determine how decisions are made in the face of unknown variables and uncertainty decision environmental framework. The theory began to evolve from the middle of the 20th century due to its importance and contributions from a number of academic disciplines (Hansson, 2005). Recently, decision theory has earned an academic focus and has been pursued by scholars in a different discipline such as economics, philosophy, statistics, psychology, politics, management and social sciences (Tversky& Daniel, 1986). Decision theory was classified into three following areas of decision making. (i) Descriptive decision theory examines how unreasonable beings make decisions. Prescriptive decision theory attempts to offer guidelines for managers to make the best possible decisions under an uncertain decision-making framework. The practical application of prescriptive approach is known as decision analysis which aimed at discovering the optimal decision methodologies to assist managers to take superior decisions Normative decision theory provides guidance for making decisions given a set of values (Hansson, 2005). The theory of choice has been used by various scholars to address various decision issues (Hansson, 2005; Sobel, 1990; Steele & Stefansson, 2015; Tversky& Daniel, 1986; Weirich, 1985).

3. METHODOLOGY

The primary data needed for the study objectives were collected through a survey conducted among some selected Block Industries within Kaduna Metropolis. A questionnaire was designed for this purpose, and it was distributed purposively to the selected employees taking part in actions and activities on carrying out business in their respective companies in February 2022, and to purposively to Managing Director or an Accountant. The number of questionnaires analyzed were (42) valid questionnaires. Resolution data were analyzed using the statistical program SPSS.

Quantitative data were collected using a self-administered questionnaire, in which the employees were asked to state the likelihood on a 5-point scale: [5] strongly agree; [4] agree; [3] neutral; [2] disagree; [1] strongly disagree. 50 copies of the questionnaire were delivered by hand on the respondents, 42 copies were returned (percentage of 86%).

Other Data is collected from secondary sources. Secondary data is collected from articles published by the well-known periodicals, books, and dissertations.

The Statistical Package for Social Sciences SPSS was applied in analyzing the data received; Statistical Analysis tools include the followings:

1. Descriptive Statistics, mainly frequencies and percentages, were used to analyze sample characteristics according to Gender, Position, educational level and experience.
2. Correlation, Regression Analysis were used to analyze and describe study variables from a statistical point.
3. Reliability Test using Cronbach's Alpha was used to test the reliability of the scale.

4.1 Demographic Results

Demography of the respondents includes gender, position, qualification and years of experience working with the organization or familiarization with BEP concept.

Table 1: Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	38	90.1	90.1	90.1
	female	4	9.9	9.9	100.0
	Total	42	100	100.0	

Source: SPSS Output, 2022

From the SPSS output on the gender of respondents from selected block industries within Kaduna Metropolis, it can be seen that seventy-three out of the eighty respondents are males. This means that 71.6% represent males. This implies that males dominate working in the block industries within Kaduna Metropolis. It is due to the nature of the work that requires energy application on mixing cement, off-loading and on-loading blocks which is difficult for females.

On the other hand, female’s respondents were only seven out of eighty. This means that females represent only 6.9% out of hundred percent. This shows that although block industries are dominated by males, but females too participate on various positions and operations. Some of the positions that female too represents includes accountant, marketing manager or cashier in the block industries. Females also represent or act on behalf of Accountant or Managing Director in some of the block industries.

Table 2: Position

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Managing Director	32	76.2	76.2	76.2
Accountant	10	23.8	23.8	100.0
Total	42	100.0	100.0	

Source: SPSS Output, 2022

From the outcomes of the study, it is observed that the position of the respondents’ jobs ranges from Managing Director and Accountants. Forty-two are Managing Directors, while ten are Accountants. This implies that 76.2% represent MD, while 23.8% represent Accountants. This shows that, MDS and Accountants are the major respondents of this study on BEP analysis. Although there are some cases where MD or Accountants have representatives in answering questions sent to them.

4.2 Descriptive Statistics

Descriptive figures of frequencies and percentage of the respondents based on the five likert-scale questionnaires presented to selected block industries within Kaduna Metropolis as in Table 3.

Table 3: Sales

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	2	4.8	4.8	4.8
Disagree	2	4.8	4.8	9.5
Neutral	4	9.5	9.5	19.0
Agree	16	38.1	38.1	57.1
Strongly Agree	18	42.9	42.9	100.0
Total	42	100.0	100.0	

Source: SPSS Output, 2022

Based on the outcome, forty-three percent strongly agreed that selling price and sales has significant impact on profitability of the blocks. Selling price and sales volume determine the amount of profit to be generated and BEP concept. Thirty-eight percent agreed that selling price is major determinant of profit and one of the components of BEP analysis. While four percent disagree that selling price is one of the components of BEP analysis. This can be possible base on the nature of some respondents that cannot comprehend the questions without interpreter.

4.3 Correlation Matrix

The correlation between the BEP (Sales, Cost and Volume) and Profitability (Decision) are mixed of both positive and negative correlations. Pearson correlations show positive correlation between Sales, Volume and Profit. This implies that where Sales or Volume increases, automatically profitability increases too. However, there is negative relationship between Cost of production and Profit. This implies that, when there is increase in cost of production, profitability will decrease. This was caused by increase in the price of cement, diesel and sharp sand. Also, there are mixed correlations between the independent variables themselves such as Cost and Sales have positive correlations; while Volume and Sales have negative correlations.

Moreover, multi-collinearity test is further conducted in which all the co-efficient values are within the range. Variance Inflation Facto values are all less than 10, while tolerance values are less than 1. This is an indication of complete absence of multi-collinearity threat on reliability of the result.

4.4 Regression Result

Table 4: Regression Result

Variable	Beta-Value	T-Value	P-Value	Tolerance	VIF
Sales	0.185	1.828	0.174	0.996	1.004
Cost	-0.441	-3.300	0.002	0.998	1.002
Volume	0.301	2.248	0.030	0.995	1.005
F-Statistics	6.050				
F-Sig	0.002				
R			0.569		
R ²			0.323		

Adj-R ²			0.270		
Durbin Watson			0.969		

Source: SPSS Output, 2022

4.4 Regression Analysis

The regression result shows the positive significant relation between volume of production and profitability. Volume of production has beta value of 0.301, T-value of 2.248 and P-value of 0.030. This implies that there is statistical positive and significant relation between volume of production and profitability at 5% level of significance. Therefore, hypotheses one formulated on null form failed to be accepted. The hypothesis stated that there is no significant effect of volume of production on profitability of selected block industries within Kaduna Metropolis.

However, the regression shows negative and significant relationship between Cost of Production and profitability of selected block industries within Kaduna. Cost of Production has beta value of -0.441, T-value of -3.300 and P-value of 0.002. This implies that there is statistical negative and significant relation between Cost of Production and profitability at 1% level of significance. Therefore, hypotheses two formulated on null form failed to be accepted. The hypothesis stated that there is no significant impact of Cost of Production on profitability of selected block industries within Kaduna Metropolis

Moreover, the regression output shows positive and insignificant relationship between Sales and profitability of selected block industries within Kaduna. Sales has beta value of 0.185, T-value of 1.828 and P-value of 0.174. This implies that there is statistical positive and insignificant relation between Sales and profitability at more than 10% level of significance. This indicates that it is not always that Managers and Accountants of selected block industries within Kaduna Metropolis that applies BEP principles in their operations. Some did not attend any educational level, although after questions are transmitted to their understanding acknowledge of applying it. Therefore, hypotheses three formulated on null form failed to be rejected. The hypothesis stated that there is no significant impact of Sales on profitability of selected block industries within Kaduna Metropolis

Furthermore, correlation co-efficient value is 56%, the co-efficient of determination value (R²) is thirty-two percent. This implies that the overall influence of independent variables (Sales, Cost and Volume) on profitability account for 32% while remaining cause by other factors not captured in the study such as sectors, periods, variables; and so on. F-statistical value of 6.050 which is statistically significance at 1% level of significance (0.002). This implies that the model is well fitted and all the variables are well selected, active and not redundant.

VI. Conclusion and Recommendation

It is concluded that selected block industries within Kaduna Metropolis applied BEP concept in their operations. Sales, Costs of production and volume have significant impact on their profitability. The study recommends training and enlightenmenton the BEP concept and its components as some Managers or accountants of selected block industries within Kaduna Metropolis come across the concept for the first time in their operations.

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