The Role of Raw Material Price Fluctuations on Organizations' Financial Performance

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ABSTRACT

This research describes the impact of raw material price on the financial performance of organization. Where this research aims to determine the effect of raw material price fluctuation on manufacturing cost (manufacturing cost is the cost of raw material costs, direct labor costs and factory overhead costs) and its impact on the organization's net profit. This research used secondary data obtained from the annual reports of companies listed in the Saudi Stock Exchange for the years 2019, 2020 and 2021, and the number of these companies is 221 company divided into twenty-one sub-sectors, and this research focuses on the materials sector, which owns 43 company, where The effect of raw material prices appears on the total profit of the companies of this sub-sector because their activity is the transformational industry that relies on petroleum derivatives as raw materials. The results showed that the fluctuation of raw material prices clearly affects the cost of goods sold, which in turn affects the net profit.

The first chapter of this research is an Introduction to the impact of raw material price fluctuation on manufacturing cost, the most important scientific theories on costs, and the impact of manufacturing cost on cost of goods sold, which represents one of the two components (sales and cost of goods sold) to gross profit. Which affects the net profit, which is the most important measure of the financial performance of the organization.

The second chapter of this paper is a literature review and covers the basic elements, background, parameters and models of raw material price fluctuations and their impact on net profit.

The third chapter of this paper is the methodology that describes the study participants, who were selected from organizations in the manufacturing sector and given them the role of cost managers and production managers, where a total of one hundred people were selected as participants. By answering the research questions, detailed and descriptive data collection procedures were then demonstrated using a variety of methods and tactics to extract data in one of two main ways: qualitatively, using a set of techniques to analyze qualitative data; or quantitatively, by using a variety of methods to analyze quantitative data.

The fourth chapter of this paper is the data analysis and presentation of results of findings, which confirm the link between the independent variable and the dependent variable. Regression analysis was performed using three tests, the model summary, ANOVA analysis, and coefficients analysis.

The fifth chapter of this paper is the conclusions, implications. In this research, it was concluded that raw materials are considered one of the most important aspects of the manufacturing process. This is because access to raw materials at reasonable prices and without exposure to the risk of price fluctuations makes the manufacturing process within the organization more adaptable and less difficult to implement. On the net profit of the organization, it is necessary for organizations to ensure that they have developed a strategy that helps them deal

with situations such as price fluctuations. The research also recommended the need to invest in research and development to choose the best raw materials, which are cost effective. At the end of this chapter, the implications of this study were explained as useful in estimating the effects of raw material price fluctuations on the financial performance of the organization, and it also provided executive managers with an analytical tool to control the process of obtaining raw materials.

Keywords: Raw Material Price, Raw Material Price Fluctuation, Gross Profit and Net Profit.

CHAPTER ONE - INTRODUCTION

1) Introduction

The rapid development of business requires that organizations compete to achieve the highest levels of profitability. Therefore, organizations must be able to meet all business challenges to be able to grow their profitability despite the strong competition. Therefore, the main goal of any organization is to achieve the highest profits to maintain its continuity. That is, the role of the cost of raw materials and its impact on the total profit, which in turn affects the net profit of the organization. In other words, the organization has a variety of goals in the long and short term. The most important of these goals is to achieve optimal profit. Whereas, making a profit is important because it relates to various accounting concepts that include the continuity of the organization (going concern), its growth, and the development of its business to a better level. To ensure that the business of the organization can generate profit, the management of the organization must properly plan and control two factors affecting profit, namely, revenue and costs. The selling price plays the main player in the volume of revenues, while the price of raw materials plays the main player in the value of costs.

The most important challenge facing the organization to achieve its main goal (profitability) is the problem of the smooth production process. As the production process requires sacrifices to obtain the elements of the production process, which are raw materials, labor costs, and production costs. Since the most important element of the production process is the cost of raw materials. The production process does not work perfectly without raw materials with an acceptable cost without fluctuation in the prices of raw materials, whether positively or negatively. Because raw materials are one of the most important elements of the production process, so raw materials must be available at a satisfactory cost and without fluctuations in them.

Raw materials are considered one of the important elements in the production process, because the availability of raw materials at the appropriate cost and without price fluctuation makes the production process within the organization more flexible and easier. Therefore, the smooth production process will produce products that meet the desire of consumers at an acceptable cost, which will lead to an increase in consumer interest in these products, an increase in demand for them, and an increase in sales volume. On the contrary, if the production process is not smooth, it will produce less satisfactory products and may make consumers switch to other organizations.

The main influence of commodity movements in a manufacturing organization involves the raw materials used to manufacture finished products. Any fluctuation in the prices of raw materials (inputs) leads to fluctuations in the prices of final products (outputs). This effect may be severe if the cost of the finished products is highly dependent on the cost of the raw materials. Examples in this context include the prices of petrochemical products.

Although there exists an abundant number of studies examining the relationship between raw material price and the costs of finished products and their impact on the organization's net profit, the literature suffers from a lack of studies that explore the relationship between raw material price and the costs of finished products, which affects

the net profit. This research seeks to bridge this gap by proposing a framework that enables us to study fluctuations in the prices of produced commodities (finished products) once the price of input commodities (raw materials) changes in the future and its impact on the net profit.

More precisely, the questions addressed in this research is:

a) If the price of raw materials were to fluctuate in the future, how much would the cost of goods sold (COGS) of the finished products change?

b) What is the impact on the net profit?

Answering these questions can help managers to price their finished products more effectively to ensure good profitability.

Through this research, we will focus on the manufacture of plastic bottles and plastic caps, which are considered within the basic materials sector in the Saudi market as a transformational industry used in the drinking water bottling industry. This industry uses raw materials (PET and polyethylene as petroleum derivatives), as its prices were affected by fluctuations in oil prices, and this is through analyzes and statistical procedures of the Saudi market as the largest oil producer.

This research will be useful for predicting the impact of a change in the price of raw materials by one dollar per ton. How much will the cost of goods sold for the final product fluctuate? Moreover, this research provides executives with an analytical tool for managing the raw material procurement process. However, since the approach proposed in this research is based on predictive models, the price volatility of raw materials should not be abnormally high so that the validity of these predictive models is suspected. In other words, the commodity market should change in a stable manner without sharp fluctuations.

1.1) The Research Importance

- Demonstrate the importance of the industrial sector in supporting and growing the economy and the country's gross domestic product.
- Determining the impact of raw material price fluctuations on the organization's profitability, and how to control this impact, which contributes to controlling the price and quality of the finished product, which benefits the consumer.
- Determining and controlling the extent of the impact of fluctuations in the prices of raw materials helps achieve the principle of continuity of the organization.
- The results of this research may be a reference for other organizations working in the basic materials sector and the manufacturing sector.

1.2) The Research Objectives

- Identify and explain the impact of raw material price fluctuations on profitability.
- Create mechanisms to reduce the negative impact of raw material price fluctuations.
- Determine the stages and elements that may be negatively affected by fluctuations in raw material prices.
- Integration of theory with applied case results to gain solid knowledge and experience for the future.

1.3) Related Definitions

1.3.1) Gross Profit

Gross profit is the revenue earned during a period minus the cost of goods sold (Henry Dauderis, David Annand & T. Jensen 2021). In other words, gross profit is the price that can be obtained from the sale of finished inventory. Gross profit is often stated as a percentage.

1.3.2) Net Profit

Net profit is determined by preparation of profit and loss account. Net profit is gross profit minus expenses (selling and administrative expenses), tax, and interest, It can be used to evaluate the performance of the organization (Christine Jonick, Ed.D. 2017).

Net profit is a useful to measure the organization's performance at converting revenue into profit (net income).

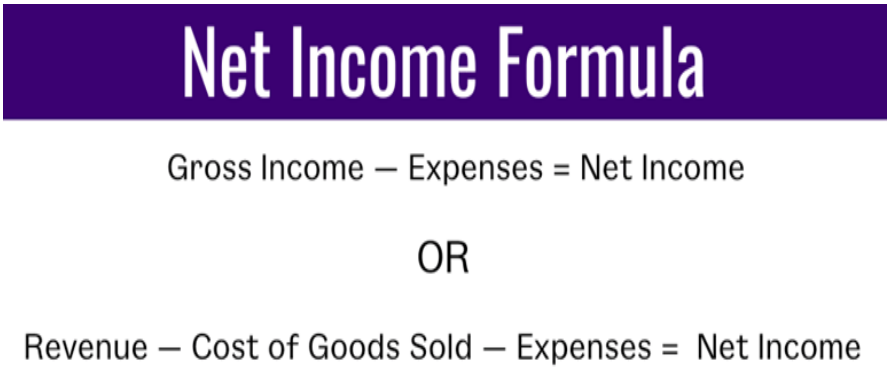


Figure 1: Net Income Formula.

1.3.3) Cost of Goods Sold (COGS)

When finished products are sold, their costs are removed from the finished goods inventory account on the statement of financial position to the cost of goods sold expense account on the income statement. Cost of goods sold is the amount paid for finished products sold. The cost of goods sold is matched to the sales in the first two rows of the income statement. The difference between sales and cost of goods sold is gross profit, which is the amount of excess over goods manufactured (Christine Jonick, Ed.D. 2017).

1.3.4) Manufacturing Costs

Manufacturing costs, whether fixed or variable, are treated as the costs of manufacturing the finished good and are included in the finished inventory in the balance sheet until the finished good inventory is sold and transferred to the cost of goods sold in the income statement. (Christine Jonick, Ed.D. 2017).

1.3.5) Finished Goods Inventory

The finished goods inventory account records the manufacturing costs of products that are completed and ready to sell (Heisinger and Hoyle 2012). Work in Process Inventory Direct materials, direct labor, and manufacturing overhead enter the work in process inventory as the costs associated with the products that are in production. Once the products are finished, their costs are transferred from the work in process inventory to the finished goods inventory (Mitchell Franklin, Patty Graybeal & Dixon Cooper 2019).

1.4) Research Structure

This research consists of five chapters:

Chapter one is an introduction to the impact of raw material price fluctuation on manufacturing cost, which affects net profit.

Chapter two is a literature review and covers the Critical analytical review of relevant past research.

Chapter three is the methodology that describes the participants in the study, where a total of 100 people were selected from organizations in the manufacturing sector. Detailed and descriptive data collection procedures were presented using one of two main methods: qualitative or quantitative.

Chapter four is the data analysis and presentation of results of findings, which confirm the link between the independent and dependent variable. The tests used in performing the regression analysis.

Chapter five is covers what the researcher reached in this research, including a conclusion, recommendations, and implications.

CHAPTER TWO - LITERATURE REVIEW

2) Literature Review

Many studies and research have studied the relationship between raw material prices and net profit, but a limited number of studies have studied the relationship between raw material price fluctuations and the cost of goods sold and its impact on net profit. This section of the research covers the basic elements, background, standards and models of raw material price fluctuations and their impact on net profit.

2.1) Production Costs

Production costs are an economic resource (input) that is spent to produce the finished product (output), and the value of the expected output must be greater than the input that is spent to produce these outputs (Mulyadi 2015). According to (Harahap, Baru & Tukino 2020), production costs are all the costs that are incurred to directly manage raw materials until they are finished goods ready for sale. Cost is divided into two types, namely costs, and expenses. Cost is the sacrifice of economic resources used to obtain goods or services. Meanwhile, the expenses are the sacrifice of several economic resources that are spent to generate income or achievements.

2.2) Raw Materials

Raw materials are one of the elements of production costs. Rather, they are the most important elements of production costs and have the largest value. Raw material cost is “the value of raw materials used in the production process to convert them into finished materials” (Siregar, Baldric, Bambang Suripto, Dodi Hapsori. et al. 2014).

2.3) Raw Materials

Raw materials are one of the elements of production costs (inputs to the production process). Rather, they are the most important elements of production costs and have the largest value. Raw material cost is “the value of raw materials used in the production process to convert them into finished materials”, Overhead costs are “all costs of production other than the cost of raw materials and direct labor costs” (Siregar, Baldric, Bambang Suripto, Dodi Hapsori. et al. 2014).

2.4) Profit

The main goal of any organization is to make a profit. Profit is the difference between income and costs for a specific period (Christine Jonick, Ed.D. 2017).

While profits are divided into several types:

- Gross Profit = Sales Revenue − Cost of Goods Sold.
- Net Profit = Gross Profit – Expenses, Tax, and Interest.

Profit is the difference between income and costs related to the activities of generating that income. To obtain the required profits according to the management's vision, a good profit plan must be prepared that considers many potential factors that may affect these profits. There are three factors that can affect profits, namely production costs, selling prices of the finished product, and volume of both sales and production, (Mukhishotul jannah 2018). According to the above, cost of production is one of the factors affecting the value of profit. Since production costs are the costs incurred to convert raw materials into a finished product ready for sale. Production costs consist of raw material costs, direct labor costs, and factory overhead costs, (Mulyadi 2012). Raw material costs are the costs incurred to purchase and prepare raw materials to be used in the production of the finished product. While direct labor costs are costs incurred to pay for work directly involved in the production process. Manufacturing overhead costs (MOH) are costs in addition to direct raw material costs and direct labor costs but are also needed in the production process which includes overhead costs, namely the cost of auxiliary materials, (Mulyana 2018). Reducing production costs is a very important activity because it affects the profits to be made. As the costs of raw materials are an important element and have a significant impact on production costs, which affect the amount of profit achieved, hence the importance of the impact of raw material price fluctuation on achieving this goal, which requires determining the impact of this fluctuation on production orders and knowing which of these production orders are capable of achieve net profit or create net losses, so management requires information about raw material prices and their impact on production costs incurred to produce certain orders, (Mulyadi 2012). The manufacturing organization is an organization that has an industrial activity to convert raw materials into a finished product through the production process. Therefore, with the manufacturing process, the organization incurs production costs. The organization expects a large net profit as its main goal is to achieve good financial performance. The gross profit will affect the net profit of the organization which affects the organization of its business (Mulyana 2018).

As mentioned before, to the best of the authors' knowledge, there does not exist any study in the literature considering the impact of raw materials' price changes on the COGS of end products. While there is a set of papers that explore how to analyze the prices of different commodities and use COGS in pricing management. Below is a brief review of these two categories.

a) Analyze the Prices of Different Commodities

Studies in this category mainly adopt statistical methods for economic/financial analysis, forecasting, and extraction of appropriate models for pricing data. For example, in the oil and petrochemical market, Since the oil and petrochemical market is one of the most important markets on which this statistical analysis can be conducted, according to (Zhang, K. K. Lai, and S.-Y.Wang 2008). Which analyzed three series of crude oil prices over different time scales and touched on several independent fundamental patterns. Subsequently, the intrinsic patterns were formed in a fluctuating process, a slowly and directionally changing component based on fine-to-coarse reconstructions. (Yang et al. 2002) studied price volatility in the crude oil market by studying the market structure in OPEC, The structure of stable and unstable demand, and related elasticity of demand. (P. K. Narayan and S.

Narayan 2007) studied crude oil price fluctuations using daily data for the period 1991-2006. Their main findings can be summarized as follows:

I. Across the different subsamples, there is inconsistent evidence of asymmetry and persistence of trauma; and
II. Over the full sample period, evidence indicates that shocks have lasting effects and disproportionate effects on volatility.

According to (E. Regnier 2007) he examined the monthly product prices of thousands of products during the period January 1945 through August 2005. Their results showed that the prices of crude oil, refined petroleum and natural gas were more volatile than the prices of about 95% of the products sold by domestic producers. As for crude commodities, crude oil prices are currently more volatile than about 65% of other products. While (T. Serra, D. Zilberman, and J. Gil 2011) assessed the spread of volatility in Brazilian ethanol markets using a specific type of maximum-likelihood estimator, which improved better than previous methods by combined estimation of ECM and multivariate GARCH operations.

b) COGS in Pricing Management

A limited number of research papers in the literature that used COGS analysis within their analytical and statistical approaches. However, (C. R. Carter, R. Kale, and C. M. Grimm 2000) is conducted survey and archiving data collected to prove that environmental purchasing is consistently linked to both net income and cost of goods sold, after controlling for organization value, financial leverage, and basic earnings per share. According to (E. P. Jack and A. S. Raturi 2003), who presented in his research a theoretical framework for measuring the elasticity of scale and linking these measures to the organization's performance. They developed four metrics using the principle that a size-elastic organization can handle similar levels of uncertainty (as measured by sales volatility) with smaller fluctuations in inputs (as measured by variance in cost of goods sold and change in inventory levels). According to (G. K. Criner, A. S. Kezis, and E. W. McLaughlin 1997) who employed scanner data for 36 consumer product items such as drinking water are used to analyze the relationship between costs of goods sold and retail prices to provide insight into retail pricing behaviors.

Despite the papers reviewed in the previous two sub-sections, there are many other papers that explore the relationship between raw material prices and cost of goods sold and the impact of this on the achieved or targeted net profit. However, they do not accurately model the relationship between raw material price fluctuations and cost of goods sold and the effect on net profit.

2.5) Review of Relevant Past Research.

2.3.1) Relationship Between Net Profit and Raw Material Price.

It has been considered that in this specified research study, there have been two major dependent and independent variables, which somehow stimulates and influence one another.

Figure 2 shows the relationship between net profit and raw material price fluctuations. The raw material price fluctuation is one of the elements (Raw Material Quality - Raw Material Price - Raw Material Price Fluctuation) that affect the relationship between net profit and raw materials.

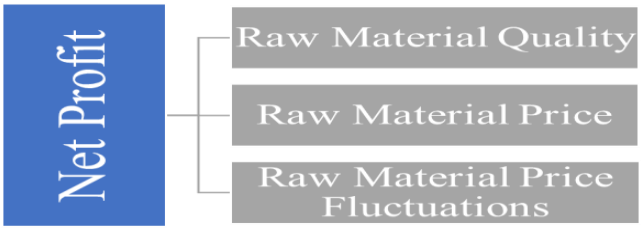


Figure 2: Relationship Between Net Profit and Raw Material.

The influence of raw material price fluctuation on a company's net profit is described in this study. Whereas the purpose of this study is to determine how the fluctuation in the price of raw materials affects manufacturing costs (where manufacturing costs are defined as the cost of raw material costs, direct labor costs, and factory overhead costs), as well as how those changes affect the net profit of the company. The impact of net profit can be influenced by raw material quality as the study conducted by indicated that the concept of net profit is mainly based on the paradigm of the total profit earned from the product sold. Since the raw material quality allows the brands to upsurge their product sales, therefore; it has been considered that the use of high-quality raw materials will help the brands to elevate their net profit.

Other than this, it has also been considered that scholars like (Heisinger and Hoyle 2012) have disagreed with the positive impact of raw material quality on the net profit by indicating that high-quality raw materials often result in increasing the production cost as well. However, this specified viewpoint of (Heisinger and Hoyle 2012) is defied by (Zhang, Lai, and, Wang 2008) as the respective research study revealed that the elevation in the production cost can be reduced by using economies of scale, therefore; the use of high-quality raw material is effective for increasing the net profit.

On the other hand, (Mulyadi 2012) indicated that raw material price is directly influencing the net profit as when the prices of raw material increases, then the net profit is reduced. Correspondingly, (Siregar, et al. 2014) indicated that when the raw material prices decrease, the net profit of the product is elevated. This validates that the raw material price (independent variable) influences the net profit (dependent variable).

Also (Christine Jonick 2017) reflected that the net profit based on raw material price fluctuation stimulates the net profit as brands cannot frequently change their product pricing. As a result, when fluctuations in raw material price occurs, then the company’s net profit becomes vulnerable. For example, if the fluctuation results in increasing raw material price, then the company experiences decline in net profit. Similarly, if the price of raw material decreases,

then the company can attain higher level of net profit. Based on this, it becomes evident that the majority of scholars believe that raw material price fluctuation influences the net profit.

2.3.2) Factors Affecting Pricing of Oil and Related Products

Oil and related products play a major role in managing our world, starting with providing factories and organizations with energy and raw materials from petroleum derivatives and others that are used in the plastics and petrochemical industries. It is difficult for our life to be without oil and its derivatives.

The prices of oil and related products are subject to fluctuations from time to time. There are several factors that affect the increases and decreases in the prices of oil and related products (Jay R. Young 2021).



Figure 3: Understanding Oil and Related Products.

There are four primary factors affecting the prices of oil and related products around the world. These factors include:

2.3.2.1) Demand

Like any commodity, one of the factors that determines the price of oil and related products is demand. The global demand for crude oil is about 90 million barrels per day.

2.3.2.2) Supply

Supply influences price. Sometimes the supply is kept below the required quantities by about one million barrels per day.

2.3.2.3) Quality of Oil

The quality of crude oil affects its price. As higher quality crude oil is easier to refine and meet environmental requirements.

2.3.2.4) Speculation

Speculation affects a lot on the volatility of oil prices. Experts disagree about the extent to which speculation affects oil prices.

2.3.3) The Impact of Fluctuations in the Oil Prices on the Raw Material of Plastic

International petrochemical prices are linked to oil prices, the main source of petrochemicals in some countries such as the Kingdom of Saudi Arabia, the United States of America, Japan, South Korea, and European countries. Petrochemicals are manufactured in these countries from petroleum derivatives such as naphtha, and about 44% of ethylene and about 60% of propylene in the world are produced from thermal cracking of naphtha. In Asia and Europe, where gas and natural gas liquids such as ethane and propane are not available, oil derivatives are relied upon in the petrochemical industries mainly for ease of purchase and transportation. Therefore, it is natural for petrochemical products to be affected by oil prices. The fluctuation of oil prices necessarily means the fluctuation of naphtha prices, and thus the fluctuation of petrochemical prices. This displays and explains the close link between crude prices and the prices of its derivatives, which is a logical and understandable relationship. The price of oil is usually multiplied by a factor of 1.2 to estimate the price of naphtha.



Figure 4: Brent Oil Futures Overview 2018-2022.

PET (Material for Plastic Bottle)				
Month	2019	2020	2021	2022
January	$ 1,140	$ 945	$ 970	$ 1,465
February	$ 1,160	$ 970	$ 1,110	$ 1,565
March	$ 1,210	$ 920	$ 1,210	$ 1,615
April	$ 1,210	$ 830	$ 1,210	$ 1,685
May	$ 1,210	$ 770	$ 1,150	$ 1,685
June	$ 1,080	$ 800	$ 1,150	$ 1,645
July	$ 1,080	$ 800	$ 1,220	$ 1,600
August	$ 1,060	$ 790	$ 1,250	$ 1,475
September	$ 970	$ 790	$ 1,290	$ 1,365
October	$ 970	$ 770	$ 1,330	$ 1,310
November	$ 950	$ 785	$ 1,615	$ 1,210
December	$ 920	$ 860	$ 1,615	$ 1,160

Table 1: Material Price PET 2019-2022 – SABIC Saudi.

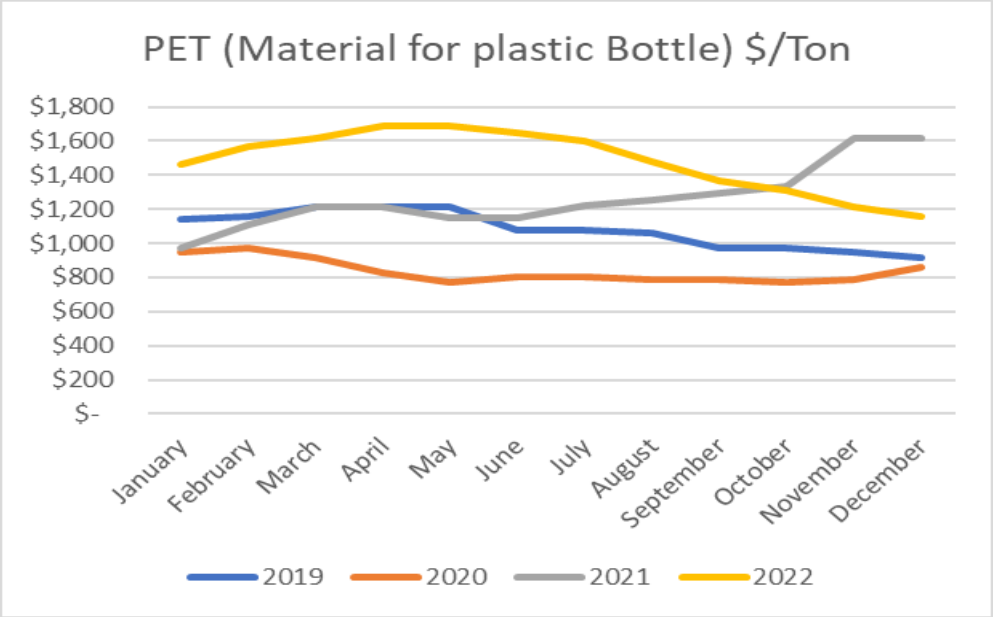


Figure 5: Material Price PET 2019-2022 – SABIC Saudi.

HDPE (Material for Plastic Caps)				
Month	2019	2020	2021	2022
January	$ 1,040	$ 917	$ 1,090	$ 1,340
February	$ 1,053	$ 910	$ 1,090	$ 1,340
March	$ 1,080	$ 920	$ 1,260	$ 1,360
April	$ 1,080	$ 840	$ 1,360	$ 1,420
May	$ 1,080	$ 840	$ 1,360	$ 1,420
June	$ 1,110	$ 860	$ 1,290	$ 1,390
July	$ 1,040	$ 910	$ 1,250	$ 1,340
August	$ 1,050	$ 935	$ 1,290	$ 1,240
September	$ 1,040	$ 960	$ 1,290	$ 1,150
October	$ 1,040	$ 980	$ 1,297	$ 1,150
November	$ 970	$ 980	$ 1,350	$ 1,150
December	$ 890	$ 1,040	$ 1,350	$ 1,150

Table 2: Material Price HDPE 2019-2022 – SABIC Saudi.

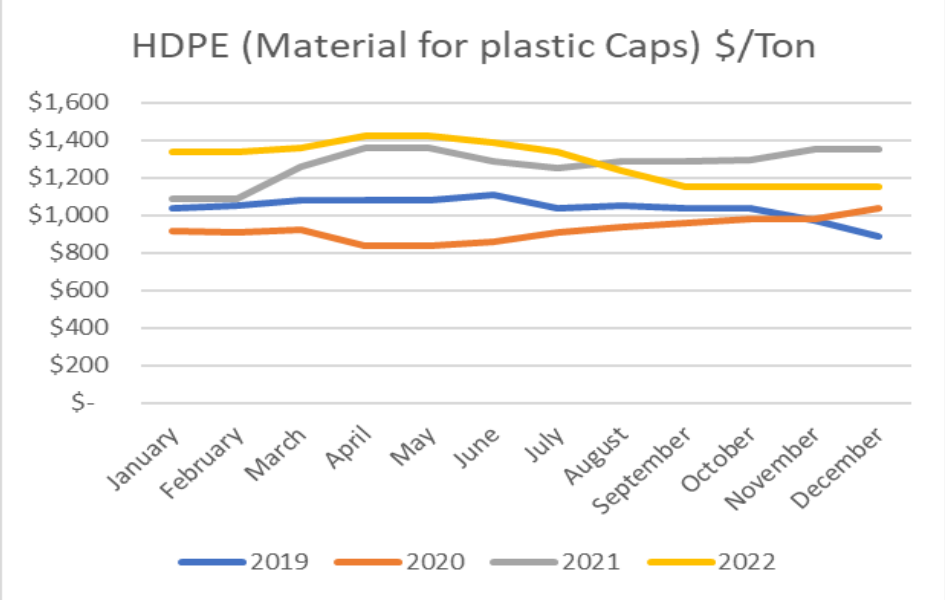


Figure 6: Material Price HDPE 2019-2022 – SABIC Saudi.

CHAPTER THREE – PARTICIPANTS OF THE STUDY RESEARCH METHODOLOGY

3.1) Description of Participants in the Study

It is normal practise to choose participants for a research based on their ability to offer an honest evaluation of the subject matter that is the focus of the investigation. A person who voluntarily takes part in an inquiry is what's known as a "research subject," and that person might be anybody. The purpose of gathering information from or about a topic is to get a deeper understanding of the issue at hand and to provide a response to the research question (Wan, 2022). Human subjects, research participants, and study volunteers are all terms that refer to the same group of individuals who take part in scientific studies. These terms are just different names for the same group of people who participate in scientific research. When trying to establish who is qualified to take part in their research, researchers often devise their own sets of eligibility requirements. This will vary from one study to the next, and it may be constrained by variables including age, lifestyle, health, and other demographic characteristics. In the end, research should be useful, not just to individuals but also to society and the world at large as a whole (Patten, 2017). This might be acquiring a grasp of the processes that lead to development and change, understanding the reasons that lay behind our actions, or learning how to live a longer and healthier life. People choose to take part in research for several reasons, the most prevalent of which is the hope that they, along with others, will be able to benefit in some way from their efforts (Fellows and Liu, 2021). In all likelihood, taking part in the research will not result in any discernible advantages for you in the long run. You should keep this in mind moving forward. In fact, the quantity of study that is conducted will not affect the number of discoveries that are valuable.

No one is capable of accurately predicting either the outcomes of a clinical trial or the consequences that it will have on the individuals who take part in the research. It is very necessary to have a comprehensive comprehension of the distinctions that exist between traditional treatment and medical investigation (Esser and Vliegenthart, 2017). Studies are carried out by researchers for one of two reasons: first, to get a more in-depth knowledge of the issue at hand, and second, to assess the effectiveness of proposed therapies, medications, or other medical interventions. The objective of conventional medical treatment is to enhance the health of the patient, and the instruments, medications, and procedures that are used in this context have all been shown to be effective in the clinical environment in the past.

Participants in this research have been selected from organisations in the manufacturing sector and have been given the role of cost managers and production managers. For the purposes of the research, a total of one hundred people will be selected as participants. The participants would mostly consist of cost managers and production managers since they would have direct contact with the handling of raw materials. As a result, they would be in a better position to give a better insight about the way variations in raw materials effect net profit.

3.2) Data Collection

Any information that has been arranged in a certain fashion is referred to as data. Consequently, the methods that are used to gather, measure, and analyse information from a variety of sources are referred to as data collecting. This is done so that research questions may be answered, data can be analysed, conclusions can be developed, and likely effects can be predicted (Harris et al., 2019). When gathering information for a study, researchers need to be able to identify the data that is being gathered, as well as where it is coming from and how it is being obtained. The gathering of information may be done in several different ways, all of which we will examine in a minute. The gathering of information is a necessary activity in the fields of study, business, and government (Hammarberg, Kirkman and de Lacey, 2016). There are two separate paths one might take to increase their level of knowledge. It is essential to be aware that the terms "approach," "method," and "type" may be interchanged depending on the circumstances and the person doing the speaking. Primary data collection is required to be completed before secondary or additional research may get underway. The process of gathering the data starts off here, which is the first step of the procedure. According to Ghauri, Grnhaug, and Strange's 2020 study, the dependability of the information that is generated is greatly boosted when the researcher himself or herself gathers the material that is going to be analysed (Ghauri, Grnhaug, and Strange, 2020). The limitation of primary research is that it often calls for a large expenditure not only of time but also of financial resources. Information that has been obtained in the past and analysed statistically is referred to as "secondary data," and is referred to as such in this article. It's possible that the researcher got this knowledge via his own independent investigation, but it's also possible that he hired someone else to do it for him and paid them to do it (Stokes and Wall, 2017). One such way of stating things is to suggest that the information was obtained from a third party or an external source. Secondary sources of information are often criticised for their lack of credibility and accuracy, even though secondary sources are more accessible and require less financial investment than main ones.

The chosen data collection method in the study is the primary quantitative method. The justification of choosing the primary quantitative method is that it would allow the researcher to gain first-hand information. This would help in making certain that relevant information is obtained that focuses on answering the topic of the study. The independent variable chosen in the study is the raw materials price fluctuation. The dependent variable is the net profit. The main focus is to assess how the raw materials price fluctuation affect the net profit. For this purpose, participants would be asked questions related to the topic of the study in a close-ended form. The participants would need to answer the questions based on the Likert-scale of 0-4 which comprises strongly agree, agree, neutral, disagree, strongly disagree.

3.3) Detailed and Descriptive Data Collection Procedure

It is possible to get insights from mining measurements, statistics, and numbers by using a variety of approaches and tactics for data mining. Data may be analysed in one of two major ways: qualitatively, by using a range of techniques for qualitative data analysis; or quantitatively, by employing a broad variety of methods for quantitative data analysis. Both approaches make use of many procedures and techniques (Privitera and Ahlgrim-Delzell,

2018). Each of these approaches to data analysis may be used on its own or in conjunction with one another to assist firm executives and decision-makers in extracting useful insights from a wide range of data sources. These approaches can be employed alone or in combination with one another. Due to the nature of the information, quantitative analysis requires the use of variables that may take on numerical values (Gravetter and Forzano, 2018). The collection and analysis of many kinds of data, such as percentages, computations, measurements, and statistics, are all potentially under the scope of this sector. Methods of quantitative data analysis typically consist of the following components: computer programmes, mathematical analytical tools, and algorithms (Wan, 2022). These components are used to alter data and provide insights that were previously hidden that are beneficial to organisations but were previously hidden from view. The term "qualitative data" is used to describe any information that is not typically presented in the form of statistics. This encompasses a very wide variety of information kinds. You will need to deal with continuous variables such as counts, averages, and percentages to conduct an analysis of qualitative data. In addition, you will need to work with discrete identifiers such as labels and characteristics to do this research (Patten, 2017). An analysis of qualitative data may comprise any combination of the following approaches: direct or participant observation, conducting interviews or focus groups, studying documents and artefacts, or any combination of these other methods. There are many various approaches to analysing data, such as content analysis, discourse analysis, correlation analysis, regression analysis, and theme analysis. Researchers concentrate their attention primarily on the kind of analysis that they would do depending on the study issue that they are most interested in (Fellows and Liu, 2021).

Both correlation analysis and regression analysis will be used in this research project as the data analysis methods of choice. The researcher decided to go with the correlation analysis since doing so would make it possible for them to see the connection that exists between the independent variable and the dependent variable. The variation in the price of raw materials is the independent variable, and the net profit is the dependent variable. This indicates that the relationship between the raw materials price fluctuation and net profit is being investigated. There are three levels of association: low, medium, and high. These are in descending order of strength. The range from 0.1 to 0.3 corresponds to a weak relationship, whereas the range from 0.3 to 0.7 corresponds to a moderate link, and the range from 0.7 to 1 corresponds to a strong association. The regression analysis determines how much of an influence the independent variable has on the value of the dependent variable. This indicates that the impact of changes in the cost of raw materials will be observed in the company's net profit.

CHAPTER FOUR - RESEARCH FINDINGS AND DATA ANALYSIS

4.1) Demographics

4.1.1) Gender

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	16	16	16	16
	Male	44	44	44	60
	Prefer not to say	40	40	40	100
	Total	100	100	100	

Table 3: Gender of the Participants.

Table 3 shows the gender of the participants. It can be observed from the Table 1 that 16% of participants were female and 44% were make. There were 40% respondents who did not prefer to reveal their gender. The majority of respondent were male within this study.

4.1.2) Age

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-29 years	16	16	16	16
	30-39 years	44	44	44	60
	40 years and above	40	40	40	100
	Total	100	100	100	

Table 4: Age of the Participants.

Table 4 shows the age of participants that were part of the study. It can be observed that 44% of participants were within the age range of 30-39 years. There were 40% respondents who were within the age range of 40 years and above. There were 16% participants who were within the age range of 16-29 years. Most participants were in the age range of 30-39 years.

4.1.3) Correlation

Correlations

		Raw Material Price	Net Profit
Raw Material Price Fluctuations	Pearson Correlation	1	.906**
	Sig. (2-tailed)		.000
	N	100	100
Net Profit	Pearson Correlation	.906**	1
	Sig. (2-tailed)	.000	
	N	100	100

**. Correlation is significant at the 0.01 level (2-tailed).

Table 5: Independent Variable Value.

Correlation analysis is the type of analysis that emphasises on the association of that exists between the independent variable and the dependent variable. It is imperative to note that the association among variables is based on three aspects, which are weak, moderate, and high. The weak association is between the 0 to 0.3 ranges. The moderate association is between the 0.3 to 0.7 ranges. The high association is between the 0.7 to 1 range. The independent variable within the current study is raw material price fluctuations. The dependent variable is the net profit. It can be observed from Table 5 that the value of the independent variable which is raw material price fluctuations is 0.906. This means that there is high association between the independent variable and the dependent variable. There has been a high amount of impact occurring over the net profit from the raw material price fluctuation aspect.

4.1.4) Regression

The regression analysis is about assessing the impact of the independent variable over the dependent variable. The threshold value that is considered is the 0.05 which means that any value above 0.05 is not considered to have any kind of impact. On the other hand, any value that is below the threshold value of 0.05 is having a significant impact on the dependent variable. The regression analysis is carried out through three tests which are model summary, ANOVA, and coefficients.

4.1.4.1) Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.906a	0.821	0.819	0.40858

a. Predictors: (Constant), Raw Material Price Fluctuations

Table 6: Model Summary.

Table 6 shows the model summary. From the model summary, the "R" value and "R-square" value are the main focus. The "R" value shows the association between the independent variable and the dependent variable. It can be observed that the "R" value is 0.906 which means there is high association existing within the model. The "R-square" value shows the predictability of the dependent variable by the independent variable. It can be observed that the "R-square" value is 0.821 which means that the independent variable is able to predict the dependent variable by 82.1%.

4.1.4.2) ANOVA

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	75.168	1	75.168	450.282	.000[b]
	Residual	16.36	98	0.167		
	Total	91.527	99			

a. Dependent Variable: Net Profit
b. Predictors: (Constant), Raw Material Price Fluctuations

Table 7: ANOVA Analysis.

Table 7 shows the ANOVA analysis. From the ANOVA table, the focus is on the "sig" value which highlights the significance of the model. It should be noted that the "sig" value is 0.000. This shows that the regression model is significant to be carried out the test.

4.1.4.3) Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-0.31	0.088		-3.537	0.001
	Raw Material Price Fluctuations	1.056	0.05	0.906	21.22	0

a. Dependent Variable: Net Profit

Table 8: Coefficients Analysis.

Table 8 shows the coefficients analysis. It is imperative to note that within the coefficient analysis, the main focus is to assess the impact that independent variable has over the dependent variable. It can be observed from Table 6 that the "sig" value of the raw material price fluctuations is 0.000. This shows that it has a significant impact over the dependent variable which is net profit. It is imperative to note that when the price fluctuation occurs regarding the raw materials, an organization's net profit is significant affected. There is a high chance that the net profit would be affected in the sense that it would lead to a decline in the way organizations are looking to attain some kind of profitable aspect. When the prices fluctuate, it leads to the organization focusing on developing strategies that would help them to maintain the profit/revenue aspect without having to deal with any major issues. In such a situation, it becomes vital for organizations to ensure that they have developed a strategy that helps them in dealing with situations such as the price fluctuations in a way that the profit aspect is not severely affected, and the organization is able to gain some form of revenue through its back-up plan.

CHAPTER FIVE – CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

5.1) Conclusion

Raw materials are considered to be one of the most important aspects of the manufacturing process. This is due to the fact that having access to raw materials at an affordable price and without the risk of price fluctuations makes the manufacturing process within an organization more adaptable and less difficult to carry out. Therefore, a smooth production process will produce products that satisfy the desire of consumers at a cost that is acceptable to them. This will lead to an increase in consumer interest in these products, an increase in demand for them, and an increase in the volume of sales that are generated by these products. On the other hand, if the manufacturing process is not running smoothly, it will result in the creation of items that are less satisfying, which may cause customers to look elsewhere for their needs. The raw materials that are utilized in the production of finished goods are the primary factor that determines how much of an impact commodity fluctuations have on a manufacturing organization. Any change in the pricing of raw materials will inevitably result in changes to the prices of finished goods. If the cost of the final goods is significantly reliant on the cost of the raw materials, then this effect may have a significant impact on the overall cost of the products.

It is of the utmost importance to be aware of the fact that when there is a change in the prices of raw materials, there is a consequential impact on the net profit of an organization. There is a good likelihood that the net profit would be impacted in the sense that it will lead to a reduction in the manner in which organizations are attempting to accomplish some type of lucrative component. This outcome would have a negative impact on the way that these businesses operate. When the prices change, it forces the organization to concentrate on building tactics that will assist them in maintaining the profit or revenue side of their business without having to deal with any significant challenges. In such a scenario, it is absolutely essential for businesses to ensure that they have developed a strategy that assists them in dealing with situations such as the price fluctuations in such a way that the profit aspect is not severely affected and the business is able to gain some form of revenue through its back-up plan. In other words, it is essential for businesses to ensure that they have developed a strategy that assists them in dealing with situations such as the price fluctuations.

5.2) Recommendations

It has been considered that a proper forecasting must be done in order to initially assess the rate of fluctuation rate of raw materials.

Sustainable and durable raw materials must be used for cost-saving and effective investment.

Investment in Research & Development must be done to select the best raw materials, which are cost-effective and sustainable as well.

5.3) Implications

The findings of this study will be helpful in estimating the effects of a shift in the price of raw materials by one dollar per ton. In addition, executives are provided with a useful analytical tool as a result of this study for controlling the process of raw material acquisition. The method that is suggested in this study is, however, predicated on the use of predictive models; hence, this research gives an idea to the management team of the corporation to appraise that the price volatility of raw materials must not be excessively high in order to avoid casting doubt on the validity of these prediction models. In other words, the market for commodities needs to be able to adapt in a consistent way, free from significant oscillations.

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Appendix

a) Questionnaire of Demographic Variables

- Gender:

  0 = Female 1 = Male 2 = Prefer not to say

- Age:

  0 = 18-29 years 1 = 30-39 years 2 = 40 years and above

b) Questionnaire of Variables of the Study

Variable/ Codes	0 Strongly Agree	1 Agree	2 Neutral	3 Disagree	4 Strongly Disagree
Raw Material Price Fluctuations					
Raw material cost is "the value of raw materials used in the production process to convert them into finished materials".					
Overhead costs are "all costs of production other than the cost of raw materials and direct labor costs".					
Raw materials are the most important elements of production costs and have the largest value.					
Oil and related products play a major role in managing our world, starting with providing factories and companies with energy and raw materials from petroleum derivatives and others that are used in the plastics and petrochemical industries.					
The prices of oil and related products are subject to fluctuations from time to time.					
Demand, Supply, Quality of Oil and Speculation affect the price of oil and related products around the world.					
Net Profit					
Net profit is gross profit minus expenses.					
Net profit is a useful to measure the organization's performance.					