Original Article

Cost-Volume-Profit Relationships And The Concept Of Sales Mix In Pharmaceutical Companies

Inomo Pratama[1], Masyhuril Ahmad Prayogi[2], Ifwan Adinata[3], Iskandar Muda[4]
[1,2,3,4] Universitas Sumatera Utara, Medan, Indonesia.
E-mail: [1]inomo04@gmail.com
DOI: 10.47750/pnr.2022.13.S08.368

Abstract

The development of profits generated by the company illustrates the company's success in carrying out operational activities and becomes a measuring tool for investors in making decisions. The purpose of this study is to determine the Cost-Volume-Profit Relationship and Sales Mix Concept in Pharmaceutical Companies in Indonesia. CVP analysis examines the behavior of total revenue, total cost, and operating profit as changes that occur in units sold, selling price, variable costs per unit, or fixed costs, and sales mix is the relative proportions in which a company's products are sold. Different products have different selling prices, cost structures, and contribution margins. To analyze fairness, disclosure, and future trends in accounting for Pharmaceutical Companies, a qualitative descriptive approach was chosen. The fundamental characteristic of the qualitative descriptive method is the use of naturalistic data or non-numeric data without variable intervention. Descriptive approach is also known as case study research, which involves studying a particular situation to find out whether a general theory can emerge from the research, or whether an existing theory emerges from a particular situation. The profit target has shrunk sharply when compared to during the COVID-19 pandemic.

Keywords: Cost Volume Profit, Sales Mix, Pharmaceutical Companies.

INTRODUCTION

Every company has a goal, which is to make as much profit as possible. Profit is the link between income or sales and costs incurred by the company, to meet the resources in producing a product or goods ready for sale during a certain period. The development of profits generated by the company illustrates the company's success in carrying out operational activities and becomes a measuring tool for investors in making decisions (Nasution, 2020). According Dewi (2019) to achieve the desired profit, the company needs to make the best possible profit planning. According to Mulyadi (2014) some factors affect the decrease or increase in profits, namely costs, selling prices, and sales volume. So the company must be able to control the costs that must be incurred by the company, and determine the number of products to be sold with the appropriate price calculation to obtain maximum profit. According to Munawir (2012) based on the many factors that affect profit changes in planning or realization, companies must keep production costs or operating costs as low as possible to minimize expenses incurred, and increase sales volume as much as possible.

Jaedicke & Robichek (1964), found that discovered that the model enables the administration to choose the safest option products while simultaneously determining optional output levels in light of a firm's goals & objectives. Found how to use a collection of equations to answer different CVP analysis difficulties in which the element selling price, total fixed cost & unit variable cost are alleged to be frequent. investigated the CVP features the CVP analysis can be fixed on variability of lands. Hilton (2002) used revenue & expense work switched inside the CVP inquiry to appraise the economic functioning selections.

Abdullahi (2015) found that if fluctuations in costs, sales volume and price affect the company's profit. Adenji (2008) proved that the CVP analysis comprehends maximum proficiency in the manufacturing procedure. Buşan & Dina (2009) found that CVP analysis involves net sales, total expense, and operating profit. Output volume, unit costs, per unit variable cost, fixed cost. Horngen et al (2006) discovered that behavior and revenue are linear for the break-even model. Ndaliman and Bala (2007) exposed that income & actual price was not directly related to cost. After all the analysis of literature review many authors have made research on manufacturing and trading industries relating to the topic of CVP analysis. So according to the review none of the studies focused on the service industry on this topic regarding City central hospital Davanagere this study is focused on the topic of CVP analysis by using secondary data of financial statements for the period from 2016 to 2020.

Seung Hwan Kim (2015) Among the managerial accounting texts available in the market, in the chapter for a CVP analysis,

many of the texts use the method of up-rounding partial numbers to whole numbers in finding the number of units for a break-even point or a target profit, As of the time when this study is carried out, no other methods are found yet that get to closer answers to a break-even point and a target profit than the current approach that is being taught. Thus, it is attempted in the study to develop a systematic approach to refining answers for the two basic questions in a CVP analysis: a break even point and a target profit. It is hoped, then, that the micro approach developed and introduced in this study help find closer answers to a break-even point and a target profit in cost-volume-profit analysis. In a CVP analysis of a company that sells single or multiple products, a break-even point and a target profit point are found for the single product, or the multiple products given the sales mix ratio among the products (Gusnardi, 2019). The focus of the study is on a company that sells multiple products, and the micro focus of the study is on how to handle decimals if they appear when finding a break-even point and a target profit point for the company. Next presented is the direct comparison between the current approach and the suggested approach of the study to finding a break-even point and a target profit point for a multi-product company (Seung Hwan, 2015).

LITERATURE REVIEW

1. Cost Volume Profit

McGraw-Hill (2003) explains that Contribution Margin (CM) is the number of remaining sales after deducting variable costs. Datar and Rajan (2021) also explain that: "CVP analysis examines the behavior of total revenue, total cost, and operating profit as changes that occur in units sold, selling price, variable costs per unit, or fixed costs. This opinion is in line with Guo (2022) who state that: "The analysis of cost-volume-profit (CVP) examines the relationship between changes in volume (output) and changes in profit. Carter (2009) argues that cost volume profit analysis is a useful tool for management to determine the relationship between costs, profits, sales volume and product mix needed to achieve the expected profit targets.

The formula underlying the CVP is as follows:

Profit = Total Sales - (Total Variable Costs + Total Fixed Costs)

or to

Total Sales = Total Variable Costs + Total Fixed Costs + Profit

Discussions related to CVP include:

a. Determine the break even point (BEP).
b. Predict sales targets with expected profits (targeted sales based on desired profit).
c. Determine the level of safety (margin of safety – MOS).
d. Sensitivity of sales volume, costs and prices impact on profit (operating leverage).

There are several basic assumptions in CVP analysis (CVP assumptions), that is:

- Costs are classified based on cost behavior, namely fixed cost and variable costs.
- Fixed costs in total are fixed up to the point of activity or capacity certain.
- Variable costs will change in proportion to changes in volume or level of activity (sales or production).
- The selling price per unit is fixed.
- The company only sells or produces only 1 type of product, and if there is more than 1 type of product then the sales mix is fixed.
- The capacity of the company does not change.
- The level of efficiency and productivity of the company has not changed.

Element of cost volume profit analisys are:

1. Fixed Cost
   L.M Samryn (2012): fixed cost are something constant cost in total regardless of changes in activity levels within a certain relevant range.
   Kashmir (2013) says the fixed cost are costs total doesn't change even though there's change in volume production or sales (within time constraints).
2. Variable Cost
   Variable cost are varies in proportion to the volume of activity or output. Kasmir (2013) says variable cost are total varies according to changes in production volume or sales.

Using of CVP method to make decision that how CVP analysis is useful for calculating how many units must be sold to break even point (BEP) or achieve the desired profit. Managers can also use this CVP analysis to make decisions, namely strategic

decisions for example the decision to add features to an existing product, where each the decision choice will affect the selling price, variable cost per units, fixed costs, units sold and operating income. CVP analysis can help managers make decisions about producing products with estimate how much profit will be achieved from the decision alternative.

An important assumption in the CVP analysis is the selling price and costs are known with certainty. In practice, this assumption is rare. Risk and uncertainty often occur in a dynamic and changing business environment. Risk and uncertainty are important parts that need to be considered in making business decisions.

2. Sales Mix

Sales mix is the relative proportions in which a company's products are sold. Different products have different selling prices, cost structures, and contribution margins. (McGraw-Hill (2003)). Sales Mix is a relative combination of the various products that the company sells (Hansen dan Mowen, 2011).

CVP with sales mix can calculate the Break Even Point if more than one type of product is sold. And in the industry, this is exactly what happened. The company sells more than one type of product. Example: a restaurant sells various kinds of food and drinks. Travel sells airplane tickets and hotel vouchers as well as tour travel packages. Therefore, calculating the CVP analysis with the sales mix will help. Even so, the assumptions and limitations of the formula used must still exist.

Sales mix refers to the ratio of the different products and services your company offers. It reflects each item sold and the profit margin it generates. After all, each product or service your business provides likely has a different price point and unique profit margin. Changing the sales mix within your company can completely change the net profit you collect, even when sales numbers remain stable.

By conducting a sales mix analysis, you can identify the items that generate the most profit for your company. Then you can determine which products or services deserve your team's focus. If one service is generating significantly more profit than another, you might decide to devote more research and development (R&D) resources, design a high-impact marketing campaign to promote it, or assign a larger customer service team to support it. After refining your focus and changing your sales mix, your organization's net profit can increase.

Conversely, your sales mix analysis can also highlight low-profit items that demand a smaller percentage of your marketing and sales resources. Instead of promoting low-profit items, you can shift your marketing or R&D budget to high-profit offerings. As a result, your profits can increase while your costs remain the same.

To determine your optimal approach, you'll need to do some basic sales mix accounting: Profit = Selling Price – Material Cost

Profit Margin = Profit / Selling Price

To use this concept effectively, it is important to know the difference between the planned and actual sales mix calculation methods:

Planned sales mix: This calculation reflects the ratio of products or services your company wants to sell over a given period of time, such as a quarter or year.

Organizations calculate this figure in advance and use it for planning purposes. Knowing your planned sales mix is essential for estimating profits, determining operating costs, and making capital purchases.

Actual sales mix: This mix calculation shows the ratio of products or services your business sells over a certain period of time. The company determines this number after the time period expires and uses it for reporting purposes. Calculating your actual sales mix is key to understanding your company's profitability and honing your business strategy. The sales mix variance reflects the difference between the planned and actual amounts. To calculate the sales mix variance, use this formula:

Sales mix variance = (Actual Unit Sales x (Actual Sales Mix Percentage – Planned Sales Mix Percentage) x Planned Contribution Margin Per Unit

Understanding your sales mix percentages is easier when you have an example to illustrate the process. Use the example scenarios below to get a better idea of the sales mix and sales mix variance. If you own a small startup record label, you may plan to launch with three albums: a low-profit extended play (EP), a moderate-profit full-length album, and a high-profit greatest hits compilation. That's the discussion of sales mix and how to calculate it in your business. This calculation process is very useful for knowing the percentage of profits in the business as a whole.

Some of implement the best practices or strategies to do the sales mix, that is:

1. Situation Evaluation
   For example, one of your products (call it product A) has become the best-selling product in the past year. However, gradually the product becomes less popular and you spend more money on the production process than making a profit. This phenomenon can be due to several reasons, but the main factors that you should suspect are societal trends and environmental conditions. For example, because of a pandemic, natural disaster, or indeed it is not "its era anymore". So, you really have to be able to see the situation and conditions around you so you can plan what kind of product sales plan.

2. Apply the Marketing Strategy
   Assume that fewer people will buy your product, so you can take the next step, which is to make a product decision. There are two general ways that you can do to make the best marketing strategy, that is: Increase marketing specifically for product because it's still has a high-profit margin and it's worthy to improvement (Maksum et al., 20200. Take back sales of product A and shift the inventory budget to another product, let's say product B. Whatever decision you make, an action plan for product marketing that clearly "reads" the future allows your company to try new tactics and reevaluate in the future. Who knows? With a smart sales plan, your main product can become a best-selling product again. The sales mix is all about avoiding stagnation and walking away from decisions that will reduce your business profits and inflict your market share.

METHODS

To analyze fairness, disclosure, and future trends in accounting for Pharmaceutical Companies (Raniyah et al.,2022), a qualitative descriptive approach was chosen. The fundamental characteristic of the qualitative descriptive method is the use of naturalistic data or non-numeric data without variable intervention. The descriptive approach is also known as case study research, which involves studying a particular situation to find out whether a general theory can emerge from the research, or whether an existing theory emerges from a particular situation (Gwenagu, 2016).

a. Primary sources, which are created when a particular event occurs. For example, reports, letters, photos, newspapers, press conferences, and others.
b. Secondary sources, namely analyzed or interpreted information obtained from other sources. For example: books, journals, articles, and others.
c. Tertiary sources, namely compiling and summarizing secondary sources. For example: thesaurus, encyclopedia, bibliography, and others.

RESULT AND DISCUSSION

1. Result

The current study emphasized the need for and significance of CVP Analysis. The study was carried out using annual reports and financial details for the last five years. We present the trend percentage of operating costs, production costs, sales volume, and net profit for the study period from 2015 to 2019.

Table 1. The CVP Analysis

Year	Operating costs	Production cost	Sales Volume	Net profit
2015	1.233.694.338.941	919.500.794.748	4.096.419.003.281	357.795.491.036
2016	1.372.039.681.575	999.091.248.554	4.527.264.454.929	394.507.717.760
2017	1.447.765.225.388	1.020.507.184.432	4.732.421.851.013	412.931.001.664
2018	1.250.888.941.694	1.136.463.709.146	4.127.078.054.673	430.673.673.757
2019	1.302.309.387.886	1.217.173.795.913	4.405.696.212.343	393.797.269.845

Lia and Suzan (2021) show that in 2015-2017 operating costs, production costs, and sales volume increased for 3 consecutive years. Even though sales volume increased in 2017, net profit decreased. Then in 2018 operating costs, production costs, and sales volume decreased, but this year net profit has increased. This is different from the theory that has been studied, that the increase in operating costs and production costs is not followed by a decrease in net income. The decline that occurred in sales volume was not in line with the decrease in net profit, on the contrary, net profit has increased.

The state-owned pharmaceutical holding company, which consists of PT Bio Farma (Persero), PT Kimia Farma (Tbk), PT Indofarma (Tbk), and the latest INUKI, estimates that the net profit that the company will achieve by the end of 2022 will shrink sharply compared to last year. This is because the revenue from products related to COVID-19 has been much reduced along with the pandemic. Director of Finance, Risk Management & HR of Bio Farma I.G.N Suharta Wijaya said that market demand for Covid-19 products has decreased every year. On the other hand, to overcome the difference in the number of sales of Covid products, the company has made improvements to the sales performance of vaccine regulation, bulk-export and retail products.

As of September 2022, BUMN Pharmaceuticals have pocketed IDR 15.9 trillion in revenue. Revenue from regular reached IDR 11.3 trillion and related to COVID-19 IDR 4.6 trillion. Until the end of 2022, the BUMN pharmaceutical holding is targeting to pocket revenue of IDR 22.2 trillion. Details of the composition of handling COVID-19 Rp. 5.99 trillion, while regular Rp. 16.2 trillion. Indeed, when compared to 2021 there was a decrease of 49% which is known to be heavily influenced by the existing pandemic conditions.

In line with that, the profit of holding pharmaceutical SOEs until the end of 2022 is targeted to reach IDR 769 billion. As of September 2022, new orders have pocketed a profit of IDR 144 billion. Suharta targets (2022) to be able to achieve a total profit of IDR 769 billion, of which the largest contribution is IDR 738 billion from regular products, while COVID-related products are only IDR 31 billion. The profit target has shrunk sharply when compared to during the COVID-19 pandemic. For information, Holding BUMN Pharmaceuticals recorded a profit of Rp. 289 billion in 2020 and jumped to Rp. 1.93 trillion in 2021, most of which will come from sales of COVID-19 related products and services. In 2022, when the pandemic hit, revenue related to COVID-related products decreased drastically, so we had to put more effort into increasing revenue from regular products.

2. Discussion

The state-owned pharmaceutical holding company, which consists of PT Bio Farma (Persero), PT Kimia Farma (Tbk), PT Indofarma (Tbk), and the latest INUKI, estimates that the net profit that the company will achieve by the end of 2022 will shrink sharply compared to last year. This is because the revenue from products related to COVID-19 has been much reduced along with the pandemic. The profit target has shrunk sharply when compared to during the COVID-19 pandemic. For information, Holding BUMN Pharmaceuticals recorded a profit of Rp. 289 billion in 2020 and jumped to Rp. 1.93 trillion in 2021, most of which will come from sales of COVID-19 related products and services. In 2022, when the pandemic hit, revenue related to COVID-related products decreased drastically, so we had to put more effort into increasing revenue from regular products.

CONCLUSION

The development of profits generated by the company illustrates the company's success in carrying out operational activities and becomes a measuring tool for investors in making decisions. The purpose of this study is to determine the Cost-Volume-Profit Relationship and Sales Mix Concept in Pharmaceutical Companies in Indonesia. CVP analysis examines the behavior of total revenue, total cost, and operating profit as changes that occur in units sold, selling price, variable costs per unit, or fixed costs, and sales mix is the relative proportions in which a company's products are sold. Different products have different selling prices, cost structures, and contribution margins. This is because the revenue from products related to COVID-19 has been much reduced along with the pandemic. The profit target has shrunk sharply when compared to during the COVID-19 pandemic

REFERENCES

Abdullahi RS. (2015) Mastering Cost and Management Accounting, IOSR Journal of Business and Management.

Adenji. (2008). An insight into Management Accounting. Value Analysis Consult Bariya, Shomulu, Lagos.

Busan G, Dina IC. (2009). Using cost-volume-profit analysis in decision making. Annals of the University of Petrosani, Economics.

Carter. K William. (2009). Cost accounting. Book 1. Fourteenth Edition, Jakarta: Salemba Empat.

Dabor, E.L., Otalor, J.I., & Erah, D.O. (2013). The Cost-Volume-Profit Model: A Discuss. Accounting Frontiers.

Datar and Rajan (2021). Horngren's Cost Accounting a Managerial Emphasis 17/E, Global Edition. New york. Pearson Education Limited.

Dewi, K.M. (2019). The Influence of Room Sales Volume and Operational Costs on Net Income at the Grand Wijaya Singaraja Hotel in 2014-2016. Undiksha Journal of Economic Education: Ganesha University of Education. p-ISSN : 2599-1418 e-ISSN: 2599-1426

Guo, Y. (2022). Enterprise Management Decision and Financial Management Based on Dynamic Cost Volume Profit Model. Journal of Function Spaces, 2022.

Gusnardi and Muda, I. (2019). Educational Institution Performance Measurement based on Miles and Huberman Models using Balanced Scorecard Approach. Quality Access to Success. Calitatea, 20(170), 32-41. https://publons.com/publon/28288775/

Gwenagu, C. (2016). Fundamentals of Research Methodology and Data Collection. Nigeria: LAP Lambert Academic Publishing.

Hansen, D.R. and Mowen, M.M. (2011). Akuntansi Manajerial. Salemba Empat. Jakarta.

Hilton R.W. (2002) Management Accounting Creating Value in a Dynamic: Business Environment.

Horngen et al. (2006). Activity based costing, Make or Buy Analysis, Budgets, Product costing, Variance analysis, Economic Ordering quantity (EOQ), Decision Theory.

Jaedicke R.K. (1964), Robichek AA. Cost Volume Profit Analysis under Conditions of Uncertainty.

L.M. Samryn, Kasmir, Amin Wijaya Tunggal, Miranda, L. (2015). Analisis CostVolume-Profit Sebagai Alat Perencanaan Laba Jangka Pendek Pada CV. Mentari Dempo Indah Pangkalpinang. STIE-IBEK Bangka Belitung. Retrieved from http://id.portalgaruda.org

Lia AP and Leny Suzan (2021). Operating Costs, Production Cost, Volume of Sales One Net Profit (A Study of Sub Sectors Manufacturing Companies Registered in the Indonesian Stock Exchange Period 2015-2019). e-Proceeding of Management, 8(6), 112-131.

Maksum, A., Muda, I & Sina A.I.A. (2021). Factors Affecting The Success of Implementing Cashier (Point of Sales/Pos) Accounting Application (March 3, 2021). Available at SSRN: http://dx.doi.org/10.2139/ssrn.3796580

McGraw-Hill (2003), Dictionary of Scientific & Technical Terms. McGraw- Hill International Book Company, New York.

Mulyadi. (2014). Cost accounting. Fifth Edition. Yogyakarta: Gadjah Mada University.

Munawir, S. (2012). Financial Information Analysis. Yogyakarta: Liberty.

Nasution, B.A, Rujiman, R (2020). Comparison of Information Disclosure Finance in Balance and CALK (LKPD Aceh Southwest). Turkish Online Journal of Qualitative Inquiry. 11(4). 1118-1129. https://tojqi.net/index.php/journal/article/view/8231

Ndaliman M.B, Bala K.C. (2007). Practical Limitations of Breakeven Theory.

Raniyah, Z., Munthe, P.N., Andariesta, N., & Muda, I. (2022). Gerwith's Theory of Justice Cases in the Pharmaceutical Industry. Journal of Pharmaceutical Negative Results, 1623-1627. https://www.pnrjournal.com/index.php/home/article/view/2764/2401

Seung Hwan Kim (2015). Cost-Volume-Profit Analysis for a Multi-Product Company: Micro Approach. International Journal of Accounting and Financial Reporting, 5(1), 68-79.