

Applying Cost–Volume–Profit Analysis to Profit Planning in The Indonesian Palm Oil Industry: A Case Study of PT Sampoerna Agro Tbk

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Abstract: The increasing volatility of palm oil prices and rising production costs have encouraged plantation companies to strengthen their profit planning strategies. Cost–Volume–Profit (CVP) analysis is widely recognized as an effective managerial accounting tool for evaluating the relationship between costs, sales volume, and profitability, thereby supporting strategic decision-making. This study aims to analyze the application of Cost–Volume–Profit analysis in profit planning at PT Sampoerna Agro Tbk, Aek Tarum Belida Plantation Unit, by evaluating the Break-Even Point (BEP) and Margin of Safety (MOS) based on the company's 2024 Work Plan and Budget (RKAP). A descriptive quantitative approach was employed using primary operational and financial data obtained from the company's RKAP, production reports, and cost reports. The data were analyzed through contribution margin, break-even, margin of safety, and profit planning calculations to assess the consistency between financial planning and actual operating performance. The findings indicate that the company operated above its break-even point and maintained a relatively safe margin against sales fluctuations, although several production cost components exceeded the planned budget, reducing cost efficiency. These findings suggest that CVP analysis provides valuable information for evaluating cost structures, improving budgeting accuracy, and supporting managerial decisions related to pricing, production planning, and profit targets. The originality of this study lies in the application of CVP analysis using actual plantation operational data integrated with the company's RKAP as a practical approach to evaluating profit planning in Indonesia's palm oil plantation industry.

Introduction

The palm oil industry plays a strategic role in Indonesia's economy by contributing significantly to export earnings, employment opportunities, and national economic growth. Indonesia has consistently been one of the world's largest producers and exporters of crude palm oil (CPO), making the sustainability and profitability of plantation companies increasingly important. However, the industry continues to face numerous challenges, including fluctuations in global CPO prices, increasing production costs, changing environmental regulations, and market uncertainties. These conditions require plantation companies to implement effective financial planning and managerial decision-making to maintain operational efficiency and long-term competitiveness.

Profit planning has become one of the most important managerial activities in supporting business sustainability. Effective profit planning enables management to estimate future earnings, allocate resources efficiently, determine production targets, and anticipate business risks arising from changes in market conditions. In agribusiness companies, particularly those operating in the palm oil sector, accurate profit planning is essential because profitability is highly influenced by production volume, selling prices, and production costs. Consequently, managers require analytical tools capable of evaluating the interaction among these variables to support strategic decisions.

One of the most widely applied managerial accounting techniques for profit planning is Cost–Volume–Profit (CVP) analysis. CVP analysis examines the relationship among sales volume, selling price, variable costs, fixed costs, and profit. The approach assists managers in determining the contribution margin, Break-Even Point (BEP), Margin of Safety (MOS), and target profit under different operational scenarios. By providing quantitative information regarding the effects of cost and sales fluctuations on profitability, CVP analysis supports budgeting, pricing strategies, production planning, and performance evaluation. Therefore, CVP has become an important decision-support tool for organizations operating in highly competitive and uncertain business environments.

Several previous studies have demonstrated the usefulness of CVP analysis in supporting managerial decision-making. Nur Azlin Nadia (2022) found that CVP analysis effectively evaluated Break-Even Point and Margin of Safety in determining profit targets within the palm oil processing industry. Similarly, Sudaryono et al. (2024) reported that CVP analysis helped identify production cost inefficiencies and sales risks while supporting strategic profit planning. Angelina et al. (2022) also concluded that CVP analysis improved short-term profit planning through the evaluation of contribution margin and operating leverage. Likewise, Meidi Yanto (2020) emphasized that CVP analysis could assist management in identifying sales targets required to achieve expected profitability while improving cost control strategies. These studies consistently indicate that CVP is an effective managerial accounting tool for financial planning and performance evaluation.

Despite these contributions, previous studies have primarily focused on manufacturing companies, food and beverage businesses, or palm oil mills by emphasizing the calculation of Break-Even Point and Margin of Safety as separate financial indicators. Limited attention has been given to integrating CVP analysis with the Company's Work Plan and Budget (Rencana Kerja dan Anggaran Perusahaan/RKAP) as a comprehensive managerial planning instrument. Moreover, empirical studies employing actual operational data from plantation units remain relatively scarce, particularly in Indonesia's palm oil plantation sector. Consequently, further research is needed to investigate how CVP analysis can be utilized to evaluate the consistency between operational planning and financial performance using company budget data.

The originality of this study lies in integrating Cost–Volume–Profit analysis with the Company's Work Plan and Budget (RKAP) to evaluate profit planning using actual operational data from PT Sampoerna Agro Tbk, South Sumatra Unit. Unlike previous studies that mainly examined CVP calculations independently, this research analyzes the alignment between planned financial targets and operational performance, thereby providing practical managerial insights for budgeting, cost control, and strategic decision-making within the palm oil plantation industry.

Therefore, this study aims to analyze the implementation of Cost–Volume–Profit analysis as a profit planning tool at PT Sampoerna Agro Tbk. Specifically, the study evaluates the Break-Even Point (BEP) and Margin of Safety (MOS) based on the Company's Work Plan and Budget (RKAP) for 2024 to determine the effectiveness of CVP analysis in supporting managerial decision-making and improving profit planning.

Research Method

This study employed a descriptive quantitative research design to examine the application of Cost–Volume–Profit (CVP) analysis in profit planning. The research focused on evaluating the relationship between production costs, sales volume, and profitability through the calculation of Contribution Margin, Break-Even Point (BEP), Margin of Safety (MOS), and target profit. A descriptive approach was adopted to provide a comprehensive evaluation of the consistency between the Company's Work Plan and Budget (Rencana Kerja dan Anggaran Perusahaan/RKAP) and the company's actual operational performance.

The research was conducted at PT Sampoerna Agro Tbk, South Sumatra Unit, Indonesia. The object of the study comprised the company's operational and financial data related to production costs, production volume, sales performance, and the 2024 Company's Work Plan and Budget (RKAP). The analysis focused on evaluating the effectiveness of CVP analysis in supporting profit planning and managerial decision-making. The study analyzed the relationship among several managerial accounting variables within the Cost–Volume–Profit framework. Production costs were classified into fixed costs and variable costs, while sales revenue, production volume, contribution margin, Break-Even Point (BEP), Margin of Safety (MOS), and target profit served as the primary analytical variables. These variables were evaluated to determine the company's capability to achieve its planned profitability based on the RKAP.

The collected data were analyzed using Cost–Volume–Profit (CVP) analysis. The analytical procedures consisted of calculating Contribution Margin, Contribution Margin Ratio, Break-Even Point, Margin of Safety, and Target Profit using the following equations.

Contribution Margin

$$CM = Sales - Variable Cost$$

where:

CM = Contribution Margin

Sales = Total Sales Revenue

Variable Cost = Total Variable Production Cost

Contribution Margin Ratio

$$CMR = \frac{Contribution\ Margin}{Sales} \times 100\%$$

where:

CMR = Contribution Margin Ratio (%)

Break-Even Point (Sales)

$$BEP_{Sales} = \frac{Fixed\ Cost}{Contribution\ Margin\ Ratio}$$

where:

BEP = Minimum sales revenue required to avoid operating losses.

Break-Even Point (Unit)

$$BEP_{Unit} = \frac{Fixed\ Cost}{Selling\ Price\ per\ Unit - Variable\ Cost\ per\ Unit}$$

Margin of Safety

$$MOS = \frac{Actual\ Sales - BEP\ Sales}{Actual\ Sales} \times 100\%$$

where:

MOS = Margin of Safety (%)

Target Profit

$$Required\ Sales = \frac{Fixed\ Cost + Target\ Profit}{Contribution\ Margin\ Ratio}$$

Result and Discussion

Comparison of Production Volume and Production Cost

The comparison between the 2024 RKAP and actual operational performance shows a substantial deviation in FFB production at the Aek Tarum Belida Plantation Unit. The detailed comparison is presented in Table 1.

Table 1. Comparison of Budgeted and Actual Production Performance

Indicator	Actual 2024	Budget (RKAP) 2024	Difference	Performance
FFB Production (kg)	24,575,000	34,121,000	-9,546,000	Below budget
Total Production Cost (IDR)	46,962,000,000	50,604,000,000	-3,642,000,000	Below budget
Production Cost per kg (IDR)	1,910	1,483	+427	Above budget

Source: Processed from the company's 2024 operational and RKAP data.

As shown in Table 1, actual FFB production reached 24,575,000 kg, compared with the RKAP target of 34,121,000 kg. The actual production volume was therefore 9,546,000 kg, or approximately 27.98%, below the planned level.

In contrast, total actual production cost amounted to IDR 46.962 billion, which was IDR 3.642 billion lower than the RKAP budget of IDR 50.604 billion. Thus, the actual total production cost did not exceed the budget. However, production cost per kilogram increased from IDR 1,483 under the RKAP to IDR 1,910 in actual realization, representing an increase of approximately 28.79%.

This finding indicates that the primary cost-efficiency problem was not an increase in total expenditure but the substantial decline in production volume. The lower production volume resulted in production costs being distributed over a smaller output base, thereby

increasing the cost per kilogram. From a CVP perspective, this condition is important because changes in production volume influence the relationship between costs and profitability.

Therefore, the comparison of total production cost alone is insufficient to evaluate operational efficiency. Management needs to consider production cost per kilogram together with production volume because a lower total cost can occur simultaneously with lower production efficiency when production volume declines substantially.

Contribution Margin Analysis

The detailed contribution margin calculation is presented in Table 2.

Description	Actual 2024 (IDR)	Budget 2024 (IDR)	Difference (IDR)
CPO Revenue	308,924,535,859	428,924,266,669	-119,999,730,810
Kernel Revenue	54,845,743,880	76,150,209,870	-21,304,465,990
Total Revenue	363,770,279,739	505,074,476,539	-141,304,196,800
Variable Cost – Plantation	(33,772,000,000)	(37,245,000,000)	+3,473,000,000
Variable Cost – Mill	(22,068,000,000)	(23,495,000,000)	+1,427,000,000
Contribution Margin	307,930,279,739	444,334,476,539	-136,404,196,800
Fixed Cost – Plantation	(13,190,000,000)	(13,359,000,000)	+169,000,000
Fixed Cost – Mill	(7,170,000,000)	(8,941,000,000)	+1,771,000,000
Operating Profit	287,570,279,739	422,034,476,539	-134,464,196,800
Contribution Margin Ratio	84.64%	87.97%	-3.33 pp

Source: Processed from the company's 2024 operational and RKAP data.

Table 2 shows that actual total revenue amounted to IDR 363.770 billion, compared with IDR 505.074 billion under the budget. The difference of IDR 141.304 billion was primarily associated with the lower production and sales volume.

The contribution margin decreased from IDR 444.334 billion under the RKAP to IDR 307.930 billion in actual realization. Similarly, the Contribution Margin Ratio decreased from 87.97% to 84.64%.

The decrease in CMR indicates that the actual cost-volume relationship was less favorable than anticipated in the RKAP. Within CVP analysis, contribution margin represents the amount available to cover fixed costs and generate operating profit after variable costs have been deducted. Therefore, the decline in CMR indicates a reduction in the proportion of revenue available for covering fixed costs and generating profit.

The actual operating profit of IDR 287.570 billion was also substantially below the RKAP target of IDR 422.034 billion. This represents a shortfall of IDR 134.464 billion.

These findings are consistent with Meidi Yanto (2020), who emphasized the importance of production efficiency and cost control in maintaining contribution margin and achieving

planned profitability. They are also consistent with Sudaryono et al. (2024), who found that cost inefficiency can affect financial planning and profitability.

Break-Even Point Analysis

The detailed BEP calculation for the actual and budgeted conditions is presented in Table 3.

Table 3. Break-Even Point Analysis		
BEP Indicator	Actual 2024	Budget 2024
Fixed Cost (IDR)	20,360,000,000	22,300,000,000
Variable Cost (IDR)	55,840,000,000	60,740,000,000
Total Revenue (IDR)	363,770,279,739	505,074,476,539
Contribution Margin (IDR)	307,930,279,739	444,334,476,539
Contribution Margin Ratio	84.64%	87.97%
BEP Sales (IDR)	24,052,077,313	25,348,383,754
BEP Production (kg)	1,709,933	1,802,067

Source: Processed from the company's 2024 operational and RKAP data.

The results show that actual BEP sales amounted to IDR 24.052 billion, while budgeted BEP sales amounted to IDR 25.348 billion. In terms of production volume, actual BEP was 1,709,933 kg, compared with 1,802,067 kg under the budget.

Actual revenue of IDR 363.770 billion was substantially higher than the actual BEP sales of IDR 24.052 billion. This indicates that the company operated significantly above its break-even point. Similarly, actual production of 24.575 million kg was considerably higher than the 1.710 million kg required to reach the break-even level.

From a CVP perspective, BEP represents the minimum level of sales required to cover fixed and variable costs. Therefore, the substantial difference between actual sales and BEP indicates that the company had a strong operating cushion during the period under analysis.

The finding is consistent with Nur Azlin Nadia (2022), who demonstrated the usefulness of CVP analysis in evaluating BEP and MOS in the palm oil industry.

Margin of Safety Analysis

The detailed Margin of Safety calculation is presented in Table 4.

Table 4. Margin of Safety Analysis		
Indicator	Actual 2024	Budget 2024
Total Revenue (IDR)	363,770,279,739	505,074,476,539
BEP Sales (IDR)	24,052,077,313	25,348,383,754
Margin of Safety (IDR)	339,718,202,426	479,726,092,785
Margin of Safety (%)	93.38%	94.98%

Source: Processed from the company's 2024 operational and RKAP data.

The actual Margin of Safety was 93.38%, slightly lower than the budgeted MOS of 94.98%. In monetary terms, the actual MOS amounted to IDR 339.718 billion, while the budgeted MOS was IDR 479.726 billion.

The high actual MOS indicates that the company had a substantial buffer before sales would decline to the break-even level. In other words, the company could tolerate a considerable decline in sales before reaching the operating break-even position.

However, the high MOS should not be interpreted as evidence that the company achieved its planned profitability. Actual operating profit amounted to IDR 287.570 billion, compared with the RKAP target of IDR 422.034 billion.

This distinction is important because MOS measures operating safety, whereas operating profit relative to the RKAP measures profit-target achievement. Thus, the company can have a high MOS while simultaneously failing to achieve its planned profit target.

Target Sales and Profit Planning

The target-sales analysis provides additional information regarding the level of sales required to support the company's profit-planning objectives.

Table 5. Target Sales Based on CVP Analysis

Indicator	Actual 2024	Budget (RKAP) 2024	Difference
Target Sales Volume (kg)	25,863,754	37,732,148	-11,868,394
Target Sales Value (IDR)	363,752,622,438	530,671,874,452	-166,919,252,014
Operating Profit (IDR)	287,570,279,739	422,034,476,539	-134,464,196,800

Source: Processed from the company's 2024 operational and RKAP data.

The results show that the actual target sales volume was 25,863,754 kg, compared with 37,732,148 kg under the RKAP. In monetary terms, the actual target sales value was IDR 363.753 billion, compared with IDR 530.672 billion under the RKAP.

The lower sales target is consistent with the lower actual production volume. Since actual FFB production was only 24.575 million kg compared with the planned 34.121 million kg, the company's capacity to generate the sales volume assumed in the RKAP was also reduced.

The results further show that actual operating profit was IDR 287.570 billion, below the RKAP target of IDR 422.034 billion. Thus, although the company remained substantially above its break-even point and maintained a high MOS, it did not achieve the planned operating profit.

This finding reinforces the importance of distinguishing between break-even achievement and profit-target achievement. CVP analysis provides management with information not only regarding the minimum sales required to avoid losses but also regarding the sales volume required to achieve a desired level of profitability.

Overall CVP Analysis

The overall CVP results are summarized in Table 6.

Table 6. Summary of CVP Analysis: Actual versus RKAP

Indicator	Actual 2024	Budget (RKAP) 2024	Variance	Interpretation
FFB Production (kg)	24,575,000	34,121,000	-9,546,000	Below target
Total Revenue (IDR)	363,770,279,739	505,074,476,539	-141,304,196,800	Below target
Total Production Cost (IDR)	46,962,000,000	50,604,000,000	-3,642,000,000	Below budget
Production Cost/kg (IDR)	1,910	1,483	+427	Less efficient

Indicator	Actual 2024	Budget (RKAP) 2024	Variance	Interpretation
Contribution Margin (IDR)	307,930,279,739	444,334,476,539	-136,404,196,800	Lower
Contribution Margin Ratio	84.64%	87.97%	-3.33 pp	Lower
BEP Sales (IDR)	24,052,077,313	25,348,383,754	-1,296,306,441	Above BEP
BEP Production (kg)	1,709,933	1,802,067	-92,134	Above BEP
Margin of Safety	93.38%	94.98%	-1.60 pp	High safety
Operating Profit (IDR)	287,570,279,739	422,034,476,539	-134,464,196,800	Below target
Target Sales (kg)	25,863,754	37,732,148	-11,868,394	Below target
Target Sales (IDR)	363,752,622,438	530,671,874,452	-166,919,252,014	Below target

Source: Processed from the company's 2024 operational and RKAP data.

Table 6 demonstrates that the company experienced a substantial deviation between planned and actual operational performance. Actual FFB production was 27.98% below the RKAP target, while total production costs remained below the budget by IDR 3.642 billion. Nevertheless, production cost per kilogram increased by IDR 427 per kilogram.

The lower production volume was accompanied by a decline in contribution margin from IDR 444.334 billion to IDR 307.930 billion and a decrease in CMR from 87.97% to 84.64%. These changes indicate that the actual cost-volume relationship was less favorable than anticipated.

At the same time, the company maintained a high Margin of Safety of 93.38% and operated substantially above its break-even point. However, actual operating profit was IDR 134.464 billion below the RKAP target. Therefore, the findings demonstrate that a strong break-even position does not necessarily imply achievement of the planned profit target.

From a managerial accounting perspective, this is an important finding. CVP analysis should not be limited to determining whether the company is operating above BEP. Rather, CVP should also be used to evaluate the relationship between production volume, unit production cost, contribution margin, sales performance, and target profit.

In the case of South Sumatra Unit, the main issue identified through CVP analysis was the substantial deviation in production volume. Although total production expenditure remained below the RKAP budget, the lower production volume increased unit production cost and was associated with lower contribution margin and operating profit. Therefore, integrating CVP analysis with RKAP data provides management with a more comprehensive basis for evaluating operational efficiency and profit-planning effectiveness.

Conclusion

This study examined the application of Cost–Volume–Profit (CVP) analysis as a profit planning tool at PT Sampoerna Agro Tbk, Aek Tarum Belida Plantation Unit, by evaluating the relationship between production costs, sales volume, and profitability based on the Company's Work Plan and Budget (RKAP) for 2024. The results demonstrate that the company operated above its break-even point, indicating that actual sales were sufficient to cover both fixed and variable production costs. Furthermore, the Margin of Safety reached **93.38%**, reflecting a relatively strong financial position and a low risk of operating losses under current business conditions.

Despite maintaining positive operating performance, the study also found that the actual production volume remained below the RKAP target, resulting in an increase in production cost per kilogram from **IDR 1,483** (budget) to **IDR 1,910** (actual). Consequently,

the contribution margin ratio decreased from **87.97%** to **84.64%**, reducing the company's ability to maximize profitability. In addition, the actual operating profit and sales performance remained below the projected values established in the RKAP, indicating that production efficiency and production capacity remain critical factors in achieving future profit targets.

Overall, the findings confirm that Cost–Volume–Profit analysis provides a useful managerial accounting tool for evaluating operational performance, estimating financial risk, and supporting more effective profit planning within Indonesia's palm oil plantation industry.

The findings provide several practical implications for plantation management. First, CVP analysis may be integrated into the annual budgeting process to evaluate the consistency between production targets and expected profitability. Second, management should prioritize improving production efficiency by increasing Fresh Fruit Bunch (FFB) productivity and controlling variable production costs, thereby maintaining a higher contribution margin. Third, periodic evaluation of Break-Even Point and Margin of Safety may assist management in identifying potential financial risks and formulating more effective production and pricing strategies. Finally, integrating CVP analysis with the Company's Work Plan and Budget (RKAP) can strengthen managerial decision-making by providing quantitative support for production planning, cost control, and profit forecasting.

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