Cost Volume Profit Analysis in Procurement of New Machinery as a Basis for Margin Contribution at PT. X in Jakarta

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ABSTRACT

The purpose of this study is to determine the profit and loss budget of the Printing company "PT. X in 2024 specifically on the new Heidelberg Type CX-104 Brand Printing Machine which is a management decision to increase potential profits as well as profit contribution from overall production activities. This research analyzes cost-volume-profit (CVP) so that it can be known the break-even point of production carried out with the new machine. This research uses qualitative and quantitative methods using secondary and primary data. In separating semi-variable costs, the regression method is used, namely the cost of electricity and the profit sharing ratio. The results of this study indicate that the profit and loss budget for 2024, especially the use of new machines, experienced a profit in semester 2, as a whole or 1 year the company can get an additional profit of Rp. 206,029,705.90, the acquisition of a contribution margin of Rp.1,123,535,357.71. Plate usage varies every month depending on how many plates are used in each production run. The company will start to make a profit on the use of the machine if the plates used in the production carried out exceed 2,720 pieces of plates.

Keywords: Profit and Loss Budget; CVP; Contribution margin; Printing Machinery.

Introduction

The need for machine upgrades occurs when the company gets abundant orders beyond the usual orders that are not covered by existing machines. This need continues when external orders increase from month to month and even from year to year. Tactical decisions carried out by company management sometimes experience difficulties due to several factors such as uncertain sales budgets, variable costs that can change due to inflation and overheads that also burden the company. PT X, which is a printing company around East Jakarta, finally decided to buy a printing machine with the Heidelberg model CX-104 brand with a 4-color non-perfecting printing function in consideration of the many full-color book orders. Actually, the company already has a printing machine with the same brand; Heidelberg but with a different type that is more complete, which can print two-way or perfecting.

With the old printing machine, the company cannot optimize work based on existing orders, due to the large queue on the old printing machine. What is also an obstacle is that the old machine is more than 20 years old, which means that it has passed the economic age when looking at the general standards of PSAK No. 16. Tactical decisions taken by management certainly require information on sales budgets, production budgets, purchases and labor. In this case the company also needs information about cost volume analysis and profit from the budget prepared in order to achieve its goal, namely contribution margin.

The success of achieving the formulated goals depends largely on the management's skill in designing plans for the future. Planning is a key element in the operations of a company because it can directly affect the smoothness and success of management in achieving their goals. A well-crafted plan will enable management to work more efficiently and effectively, resulting in optimal profits in accordance with the desired target. Company management needs to have a good understanding of the situations where changes in costs and sales volume have an impact on profits. This is important so that management can consider these factors when setting sales and cost budgets (Yanto, 2020). Therefore, the research title is titled "Cost Volume Profit Analysis in Procuring New Machinery as a Basis for Margin Contribution at PT. X in Jakarta".
Research Method

The empirical research conducted is using a qualitative approach, namely conducting a sensitivity analysis of variations in revenue, costs, or other financial parameters that can affect financial results. This research also uses a quantitative approach, namely separating semi-variable costs with the Regression method.

To determine the profit budget in the next year (2024), cost volume profit (CVP) analysis is used. Secondary data in the form of Sales Budget and Production Data are obtained directly. The explanation of production cost requirements is obtained through interviews with related parties such as the Head of Production, Production Manager.

Result

To find out the amount of profit and loss budget caused by the addition of the Heidelberg brand printing machine model CX - 104. At least the following cost classification must be made:

<table>
<thead>
<tr>
<th>No.</th>
<th>Cost Type</th>
<th>Fees</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Variable Cost</td>
<td>a. Plat</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. Fountain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>c. Alkohol (I.P.A)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>d. Spare gum</td>
</tr>
<tr>
<td></td>
<td></td>
<td>e. Developer royal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>f. Plat Cleaner</td>
</tr>
<tr>
<td></td>
<td></td>
<td>g. Gum kodak</td>
</tr>
<tr>
<td>2.</td>
<td>Semi Variable Cost</td>
<td>a. Electricity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. Profit sharing ratio</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. Electrical Installation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>c. Electrical Set Up</td>
</tr>
<tr>
<td></td>
<td></td>
<td>d. Technician spare parts</td>
</tr>
</tbody>
</table>

Source: Processed.

From the results of interviews with the production manager, data on the need for consumables when using a new Heidelberg CX-104 brand machine, namely a thin iron plate that functions as a master print whose number of needs follows the needs, as well as chemicals such as fountain, alcohol which are all classified as variable. The semi-variable costs consist of the results of the calculation of the joint cost of the amount of electricity overhead adjusting to the voltage of the new machine used in hours. Regarding the profit-sharing ratio, it is obtained from the payment schedule for the profit-sharing ratio obtained from the third party, or it can be discussed as bank interest that must be paid along with the principal installments of the leasing debt. Meanwhile, fixed costs are obtained from direct interviews with the general department and HRD, which for direct labor costs are treated the same as office workers, namely based on attendance, not based on the amount of production or other variables. Electrical installation and electrical setup are costs that must be divided into all the economic life of the machine, both costs are burdened by the electricity vendor due to the addition of an electrical substation that is set specifically for new machines with 197 VA power.
It can be informed that the difference in sales budget here refers to the 2022 data which is actual information derived from external and internal print order sales. According to the information received, in the last four months or in the second semester, customer demand for certain goods such as calendars is quite large, as well as other products that require the company to provide a lot of finished goods stock.

Table 2. Recapitulation of Profit and Loss Budget for Machine Addition Year 2024

<table>
<thead>
<tr>
<th>Description</th>
<th>Semester 1 (INR)</th>
<th>Semester 2 (INR)</th>
<th>Total (INR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Sales</td>
<td>562,034,000.00</td>
<td>1,053,976,000.00</td>
<td>1,616,010,000.00</td>
</tr>
<tr>
<td>Variable Costs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Variable Cost</td>
<td>118,673,120.98</td>
<td>222,571,103.43</td>
<td>341,244,224.41</td>
</tr>
<tr>
<td>Semi Variable Cost</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Semi Variable Cost</td>
<td>402,747,892.86</td>
<td>417,988,176.82</td>
<td>820,736,069.68</td>
</tr>
<tr>
<td>Fixed Cost</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Fixed Cost</td>
<td>124,000,000.00</td>
<td>124,000,000.00</td>
<td>248,000,000.00</td>
</tr>
<tr>
<td>Total Cost</td>
<td>645,421,013.84</td>
<td>764,559,280.25</td>
<td>1,409,980,294.10</td>
</tr>
<tr>
<td>Profit/Loss</td>
<td>- 83,387,013.84</td>
<td>289,416,719.75</td>
<td>206,029,705.90</td>
</tr>
</tbody>
</table>

Source: Processed

From table 2 above, it is clear specifically in the calculation of adding a new Heidelberg Type CN-104 printing machine that the total cost in semester 1 is greater than the income, but for semester 2 the income is higher than the cost. And overall or the total of the two semesters, it appears that the company made a profit by knowing that with this machine the company printed as many as 664,253 Oplag using 4,980 sheets of plate. For planning, decision-making, and cost control purposes, semi-variable costs must be separated into fixed costs and variable costs.

By looking at Table 2 above, it appears that there are semi-variable costs in the form of electricity costs and margin installments calculated by the number of years. Therefore, the two semi variable costs are broken down first, as for the semi variable costs in question are as follows:

Table 3. Semi variable cost.
For electricity costs after statistical analysis with the help of Ms. Excel, obtained as follows:

\[
Y = 5,780,906 + 143x
\]

As for the cost of separating margin installments during 2024 is as follows:

\[
Y = 50,011,232 + 56,090,310x
\]

So that the changes in the cost structure after the separation of semi-variable costs into fixed costs and variable costs are as follows:

Table 4. Recapitulation of Profit and Loss Budget of Machine Addition Year 2024 after separation of semi-variable costs
When viewed from the graph below, it will be clear that from January to June, the company's budget specifically on the addition of machines is on average a loss, but from July to December, it generally looks profitable. This is because in the second semester, consumer demand for printed matter such as calendars and full-color general books increased. The graph is as follows:

![Graph showing profit and loss budget for adding a printing press.](image)

Figure 3. Profit and loss budget for adding a printing press.

**Calculation of Cost Volume Profit (CVP)**

The calculation of operating income in CVP analysis can be calculated with the following formula:

\[
\text{Operating Income} = \text{Sales} - \text{Variable Expenses} - \text{Fixed Expense}
\]

\[
\text{Operating Income} = (\text{Price} \times \text{Number of Units Sold}) - (\text{Variable cost per unit} \times \text{Number of Units Sold}) - \text{Total Fixed Cost}.
\]
Or Break Even Points (BEP) = \[ \frac{A}{P - b} \]

Where A = Fixed Cost, P = Selling Price Per-unit, b = Variable cost per unit.

After obtaining the results of the profit and loss budget above, then it can be calculated how many break even points, with the following explanation:

Sales - Plate price \[ \text{Rp} \ 93,500.00 \] 4.980 unit \[ \text{Rp} \ 465,630,000.00 \]
Sales - Print price \[ \text{Rp} \ 231,000.00 \] 4.980 unit \[ \text{Rp} \ 1,150,380,000.00 \]

Variable Expense \[ \text{Rp} \ 98,890.94 \]

\textbf{Contribution Margin} \[ \text{Rp} \ 1,123,535,357.71 \]

Fixed Expense \[ \text{Rp} \ 917,505,651.81 \]

\textbf{Operating Income} \[ \text{Rp} \ 206,029,705.90 \]

\[ \text{BEP} = \frac{(93,500 \times \text{Unit}) + (231,000 \times \text{Unit}) - (98,890.94 \times \text{unit}) - 917,505,651,81}{225,610 \times \text{Unit} - 917,505,651,81} \]

Unit = 4,067

With the addition of the printing press, the company will increase potential profits in addition to profits from normal activities or before the addition of the printing press. Management must ensure that the number of printed plates used in a year must exceed 4,067 plates.

\textbf{Conclusion}

The conclusion of this study is that the contribution margin with the addition of a printing machine is Rp1,123,535,357.71. For the 2024 profit and loss budget specifically for the addition of a printing press is Rp206,029,705.90. And for the break even point the plate used for book production is 4,067 pieces of plate.

\textbf{Reference}
