

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 and 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 Rp1,123,535,357.71. 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.

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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 1. Types of Costs

No.	Cost Type	Fees
1.	Variable Cost	a. Plat b. Fountain c. Alkohol (I.P.A) d. Spare gum e. Developer royal f. Plat Cleaner g. Gum kodak
2.	Semi Variable Cost	a. Electricity b. Profit sharing ratio
3.	Fixed Cost	a. Direct Labor Salary Cost b. Electrical Installation c. Electrical Set Up d. Technician spare parts

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

<u>Description</u>	<u>Semester 1</u>	<u>Semester 2</u>	<u>Total</u>
Total Sales	562.034.000,00	1.053.976.000,00	1.616.010.000,00
Variable Costs			
Total Variable Cost	118.673.120,98	222.571.103,43	341.244.224,41
Semi Variable Cost			
Total Semi Variable Cost	402.747.892,86	417.988.176,82	820.736.069,68
Fixed Cost			
Total Fixed Cost	124.000.000,00	124.000.000,00	248.000.000,00
Total Cost	645.421.013,84	764.559.280,25	1.409.980.294,10
Profit/Loss	- 83.387.013,84	289.416.719,75	206.029.705,90

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.

	Y		x
Month to	Electricity cost	Margin Installment	oplag
1	10.281.935,96	58.607.781,59	32.815,00
2	10.281.935,96	57.906.447,22	24.800,00
3	10.281.935,96	57.201.606,18	56.900,00
4	10.281.935,96	56.493.240,94	39.100,00
5	10.281.935,96	55.781.333,87	12.100,00
6	10.281.935,96	55.065.867,27	50.600,00
7	10.281.935,96	54.346.823,33	44.100,00
8	10.281.935,96	53.624.184,17	45.034,00
9	20.563.871,93	52.897.931,82	88.545,00
10	20.563.871,93	52.168.048,21	119.260,00
11	20.563.871,93	51.434.515,17	79.400,00
12	20.563.871,93	50.697.314,48	71.599,00
78	164.510.975,43	656.225.094,25	664.253,00

Source: Processed

For electricity costs after statistical analysis with the help of Ms. Excel, obtained as follows:

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	5.780.906	1.770.874	3,26	0,01	1.835.152	9.726.660	1.835.152	9.726.660
X Variable 1	143	28,41	5,04	0,00	79,93	206,53	79,93	206,53

Figure 1. Semi variable cost separation regression results of electricity cost

The regression equation for the semi variable cost separation of electricity costs above is:

$$Y = a + bx$$

$$Y = 5,780,906 + 143 x$$

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

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	50.011.232,00	12.750,53	3922,287966	2,85565E-32	49982822,06	50039641,94	49982822,1	50039641,94
X Variable 1	56.090.310,30	135.131,51	415,0794355	1,62059E-22	55789218,53	56391402,06	55789218,5	56391402,06

Figure 2. Regression results of semi variable cost separation Installment Margin

The regression equation for semi variable cost segregation above is as follows:

$$Y = a + bx$$

$$Y = 50,011,232 + 56,090,310 x$$

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

<u>Description</u>	<u>Semester 1</u>	<u>Semester 2</u>	<u>Total</u>
Total Sales	562.034.000,00	1.053.976.000,00	1.616.010.000,00
Variable Cost			
Total Variable Cost	190.644.714,67	301.829.927,62	492.474.642,29
Fixed Cost			
Total Fixed Cost	458.752.825,90	458.752.825,90	917.505.651,81
Total Cost	649.397.540,57	760.582.753,53	1.409.980.294,10
Profit/Loss	- 87.363.540,57	293.393.246,47	206.029.705,90

Source: Processed

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:

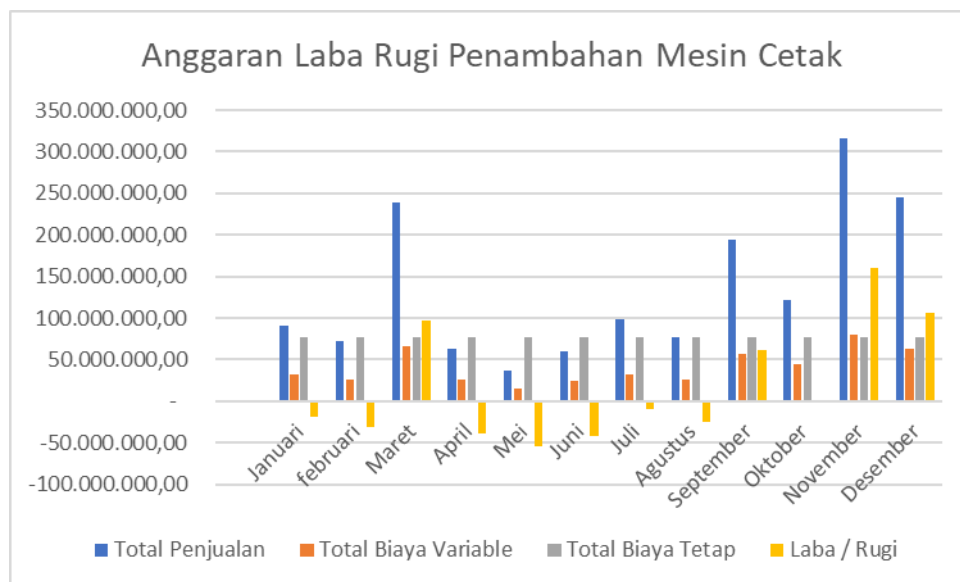


Figure 3. Profit and loss budget for adding a printing press.

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	Rp 93.500,00	4.980 unit	Rp 465.630.000,00
Sales - Print price	Rp231.000,00	4.980 unit	Rp1.150.380.000,00
			Rp1.616.010.000,00
Variable Expense	Rp 98.890,94		Rp 492.474.642,29
Contribution Margin			Rp1.123.535.357,71
Fixed Expense			Rp 917.505.651,81
Operating Income			Rp 206.029.705,90

$$\begin{aligned} \text{BEP} &= ((93.500 \times \text{Unit}) + (231.000 \times \text{Unit})) - (98.890,94 \times \text{unit}) - 917.505.651,81 \\ &= (324.500 \times \text{Unit}) - (98.890,94 \times \text{unit}) - 917.505.651,81 \\ &= 225.610 \times \text{Unit} - 917.505.651,81 \\ \text{Unit} &= 4.067 \end{aligned}$$

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.

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 Rp. 206,029,705.90. And for the break even point the plate used for book production is 4,067 pieces of plate.

Reference

- Hansen, D. R., & Mowen, M. M. (2009). *Akuntansi Manajerial* (9th ed.). Penerbit Salemba Empat.
- Interferometric, D., Aperture, S., & Scatterers, P. (2014). 徐德伟 1 , 杨梦诗 2 , 杨文 1,2,* , . 13(2), 125–136.
- Latif, M. A. (2016). Perhitungan Marjin Kontribusi Job Number 605169411 dengan Metode Cost-Volume-. 1(2), 103–108.
- Mulyadi. (2002). *Akuntansi Manajemen: Konsep, Manfaat, & Rekayasa* (3rd ed.). Salemba Empat.
- Mulyadi. (2012). *Akuntansi Biaya* (5th ed.). Sekolah Tinggi Ilmu Ekonomi YKPN.
- Pratiwi, Fi. (2020). *Anggaran Keuangan: Pengertian dan Jenis-Jenisnya*. Www.Harmony.Co.Id. <https://www.harmony.co.id/blog/anggaran-keuangan-pengertian-dan-jenis-jenisnya/>
- Priharto, S. (n.d.). *Anggaran Laba Rugi: Pengertian, Bedanya dengan Laporan Laba Rugi, dan Cara Membuatnya*. Kledo.Com. <https://kledo.com/blog/anggaran-laba-rugi/>
- Pt, P., Semesta, W., Lubuklinggau, K., Sari, D. W., Stie, M., Program, M., & Akuntansi, S. (2016). ANALISIS SISTEM COST VOLUME PROFIT DALAM PERENCANAAN LABA PADA PT. WAHANA SEMESTA KOTA LUBUKLINGGAU [Vika Fitrianita dan Dian Winda Sari]. 02(01), 43–54.

- Sakti, V. J. (2013). Penerapan Analisis Cost Volume Profit Dalam Perencanaan Laba (Studi Kasus Pada UD Rejo Mulyo Surabaya). *Akuntansi Unesa*, 4–14. <https://jurnalmahasiswa.unesa.ac.id/index.php/jurnal-akuntansi/article/download/2306/1422>
- Yanto, M. (2020). Penerapan Cost – Volume – Profit (Cvp) Sebagai Dasar Perencanaan Laba Pada Cv. Usaha Bersama Tanjungpinang. *Jurnal Dimensi*, 9(2), 369–386. <https://doi.org/10.33373/dms.v9i2.2547>