

JET2 Financial Analysis

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JET2 Task 4

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A. Summary Report for the Vice President

The company vice president has directed that a cost study be conducted along with an activity-based costing analysis for one of the Competition Bikes company plants. After completing the study, a breakdown analysis was completed along with the target profit projections. In this summary report to the vice president, there will be a recommendation on whether the company should change its costing method to an activity-based costing method.

A1) Recommendation on whether the company should change its costing method to activity based-costing:

Activity based costing is a method that focuses on the activities which in turn become the building blocks for allocating costs of products and services. An accounting method that identifies the activities that a firm performs, and then assigns indirect costs to products. An activity based costing (ABC) system recognizes the relationship between costs, activities and products, and through this relationship assigns indirect costs to products less arbitrarily than traditional methods (Investopedia, 2013).

Activity-based costing is a system that consists of two steps. The first step assigns an overhead cost to each of the products based upon how many resources are used to create the products. A list of each business activity with all of the associated costs is called an Activity Cost Pool. The second step is for the financial managers to determine the cost drivers for each of the Activity Cost Pools. This second step of the ABC helps financial managers accurately assign and allocate production costs with

its overhead costs to each product. Since a typical plant produces many different products, the activity cost pool can help a financial manager accurately assign the production costs for each product. This creates a good compromise of efficiency and accuracy for defining the product cost.

The difference between a Traditional costing and an activity-based costing is that traditional costing base their cost driver on the amount machine hours, direct labor, direct materials hours needed to produce an item. Traditional costing is known to apply one measure for the whole factory and one percentage would go to one product and another percentage to another product which isn't very accurate. Activity-based costing is different because it breaks down the overhead costs into pieces which are called Activity Cost Pools. This is where the activities that relate to the product can easily be identified and monitored for the right amount of allocations each activity should get within the activity cost pool to products.

After reviewing the unit cost comparisons for both the Titanium and the Carbonlite units using traditional and ABC costing calculations, it shows that traditional costing for the Titanium unit is at \$713/unit while the ABC is at \$656/unit for the same Titanium unit. The ABC method clearly provides evidence that it is less expensive to produce the Titanium units than previously thought by using the traditional costing method. The Carbonlite units in the traditional costing method shows that each unit costing \$1,359, unlike the ABC method showing that each unit is higher at a cost of \$1,460. This ABC analysis proves that Carbonlite units are more expensive to produce in comparison to the traditional costing method. The reason these changes occurred was because instead of a flat overhead cost based on the number of hours of labor, it was applied to the each of the activities. It results in more granular and accurate picture of the how much each product actually costs to produce. This is an significant finding that warrants adjustment in the pricing of the Carbonlite unit price in order to avoid

significant financial losses.

Competition Bikes was able to break up their manufacturing overhead costs by categories. These categories costs were: Factory Set-up, Quality Control, Engineering Services, Product Movements, Utilities and Depreciation. This process is vastly different from the Traditional Costing Method which is known to assign a total to the overall Overhead and doesn't take into consideration the different processes.

ABC and Traditional also show a substantial difference in the Total Product Cost. While both agree that the total Overhead cost is 471,400 the allocation of the costs are not appropriate applied to the products (Titanium and Carbonite). Since ABC and Traditional can agree about Direct Material, Direct Labor and Total direct cost for materials and labor, the manufacturing overhead is different for both bikes. The Titanium traditional overhead is 239,020 unlike the Titanium ABC of 188,415. The Carbonite Traditional overhead is 232,380 unlike the Carbonite ABC of 282,985.

Using the Competition Bikes Spreadsheet, the ABC method can calculate the per unit overhead cost under the ABC costs assigned to each product. This is done taking the Total ABC Overhead Cost and dividing the number of units to get the unit cost.

Titanium:

Total ABC Overhead Cost 188,415 / Titanium Units 900 = \$209.35 overhead cost per unit

Carbonite:

Total ABC Overhead Cost 282,985 / Carbonite Units 500 = \$565.97 overhead cost per unit

Using the Competition Bikes Spreadsheet, the Traditional method allocates overhead based on the direct labor dollars, total costs for all for the Bikes then it is divided by the total direct labor dollars for all of the bikes to find the unit cost. This process creates weaker controls for finance managers to

figure out the granular specific price for that individual product.

The Tradition method takes the Total direct cost for materials and labor used for each product and assigns a percentage of the manufacturing overhead to its cost. For this spreadsheet, I have found that 47.36% 239,020 is applied to Titanium and 52.63% 232,380 is applied to Carbonite which is determined by the overall total direct cost for materials and labor.

In the case with the Factory Setups, the Quantity of 545 (45 for Titanium and 500 for Carbonite), The Activity Cost per Unit the Titanium at 3.06 is considerable less than the Carbonite at 61.28 in the Factory Setups. This proves that the Carbonite product is utilizing more Activity costs to produce that product. Also, Carbonite has higher Activity Costs per unit of product in Quality control, Engineering Service, product movements. This detail of Activity Based Costing with the Activity Cost Pool can lead to actions that would improve efficiency and results.

The above is the proof that Activity Based Costing can change the product cost. Based on this Competition Bikes Spreadsheet, the ABC method can help with future product planning which will help determine the accurate unit price and appropriate overhead expenditures. Competition Bikes should implement the ABC system so that the company accurately measure the amount of money that is allocated to different processes and products.

A2) An Evaluation of the cost-volume-profit:

A2a) Analysis of breakeven point for Competition Bikes in regards to sales units and sales dollars for both Carbonlite and Titanium bikes.

Cost-volume-profit (CVP) analysis summarizes the effects of changes in an organization's volume of activity on its costs, revenue, and profit (Hilton, 2011). Cost-Volume Profit Analysis is a

form of cost accounting. CVP analysis deals with how the profits and cost change with a change in the volume. This requires that all of the company's costs, manufacturing, selling and administrative costs are to be identified as variable or fixed. The information that is generated for a company can provide answers in regards to sales volume to break even, profit that can be expected with a given sale volume, changing in the selling price, variable costs, fixed costs and output can affect profits. This process can be used by managers to help make short term decisions and to clarify whether the costs are fixed or variable. The information that it provides to Competition Bikes can help them pinpoint where the Total Revenues equal Total Cost. The CVP equation is $\text{Sales} - \text{Variable Cost} = \text{Contribution} = \text{Fixed cost} - \text{Profit}$. Contribution margin is the Sales Revenue minus the Variable Costs.

The Breakeven point is the volume of activity where the expired costs and revenues of the business are exactly equal. That means that present operations has neither an income nor a loss. A breakeven point can be found by computing the contribution-margin approach and the profit equation approach. Both of these methods can render the same breakeven point results. Using the contribution margin approach, the breakeven point is determined by dividing the fixed expenses by the unit contribution margin. Again, in order to get the unit contribution margin is by subtracting the unit sales price to the variable unit cost. To determine the breakeven point in dollar sales instead of units, the fixed expenses are divided by the contribution ratio. This is the same as unit contribution divided the unit sales price. And for the profit equation approach, the formula is: $\text{Profit} = \text{Sales Revenue} - \text{Variable Expenses} - \text{Fixed Expenses}$.

The attached worksheet already has provided the breakeven point in units and in dollars. The breakeven point for Titanium models is 1415 and for the Carbonlite models is 786. The breakeven point in sales dollars for Titanium model is \$1,273,500 and for the Carbonlite model is \$1,175,070.

These both were calculated by using the contribution margins per unit. The Titanium model shows a contribution margin of 221 (900 sales price per unit – 679 variable cost per unit) and the Carbonite model shows a contribution margin of 111 (1495 sales price per unit – 1384 variable cost per unit) and dividing these into the fixed cost for each model. To find the breakeven point in the dollar sales for each of these, they would multiple the breakeven point in units needed, that would be 1415 units for the Titanium model and 786 units for the Carbonlite model, by the sales price for each model (Titanium would be \$900 and Carbonlite would be \$1495). From reading Hilton's Contribution-Margin formula, this how I calculated the breakeven point with each model.

Titanium Model

Breakeven point in units (1415) = Fixed expenses / Unit Contribution Margin (221)

Cross multiple for the: Fixed expenses = (1415) (221) = \$312,715

Breakeven point in dollar sales = Fixed expenses/Contribution margin ratio

Contribution margin ratio = Unit Contribution margin (221) / Unit Sales Price (900) = 0.24555

As a result:

Breakeven point in dollars sales = Fixed expenses (\$312,715)/Contrib Marg Ratio (.24555) =
\$1,273,500 (Breakeven point in dollars sales)

Carbonite Model

Breakeven point in units (786) = Fixed expenses / Unit Contribution Margin (111)

Cross multiple for the: Fixed expenses = (786) (111) = \$87,246

Breakeven point in dollar sales = Fixed expenses/Contribution margin ratio

Contribution margin ratio = Unit Contribution margin (111) / Unit Sales Price (1495) = 0.0742

As a result:

Breakeven point in dollars sales = Fixed expenses (\$87,246)/Contrib Marg Ratio (.0742) =
\$1,175,070 (Breakeven point in dollars sales)

Since we have two product models, we can use the weighted average contribution margins to help determine the breakeven units for the product sales mix. Weighted average contribution margin per unit creates a benchmark of the breakeven point of the sales mix as well as the costs associated to making and selling the products with the price of each. The Breakeven units for the product sales mix is 2201 units. Here is a computation on how it works:

$$\begin{aligned} \text{Weighted Average Contribution margin (unit)} &= \\ &= \text{Contribution margin for both models /Sales mix for both models} \\ &= 198,900 + 55,500 / 900 + 500 \\ &= 254,400 / 1400 = 181.71 \text{ Weighted average contribution margin per unit} \end{aligned}$$

Now that we know what the fixed expense are for both models and the weight average contribution margin per unit. We can computer for the Breakeven units for the product sales mix:

$$\begin{aligned} \text{Breakeven units for the product sales mix} &= \text{Fixed expenses for both models/avg contrib marg} \\ &= 312,715 + 87,426 \text{ fixed expenses both models} / 181.71 \text{ weighted avg contrib marg per unit} \\ &= 2,201 \text{ breakeven units for the product sales mix} \end{aligned}$$

The information on the spreadsheet as well as above shows that Competition Bikes need to sell 2201 units (1415 units for the Titanium and 786 units of the Carbonlite) just to break even. This means that the 2201 units in sales dollars translates to a total of \$2,448,570. Competition Bikes will generate a profit if sales exceed this amount, or they will suffer a loss if the sales dollars comes in lower.

A2b) Summary report of the impacts to the breakeven point if the company management needed to increase the cost of direct materials by 10% cost increase and the needed to add \$50,000 in fixed costs to the production facility.

Every company needs to understand that changes in fixed costs and variable costs have a enormous impact of the breakeven point and profitability when using the Cost-Volume-Profit analysis.

Since this scenario says the company needs to increase \$50,000 in fixed costs and the cost of direct materials by 10%, it will result in decreases in the contribution margins. Unit contribution margin is still equal to the sales price per unit minus the variable expenses. In this situation, the variable expenses increase which results in the unit contribution margin to decrease. This is because the difference of the sales unit price per unit to the variable expenses. The Titanium unit contribution margin decreased by 30 (221 to 191). The Carbonite unit contribution margin decreased by 67 (111 to 44).

Also if the fixed costs increase by 50,000, this will cause the breakeven point in units to increase because these are directly related to each other.

Formula: $\text{Breakeven point in units} = \text{Fixed expenses} / \text{Unit Contribution Margin}$

This means that if we increase the (numerator Fixed Expenses, then the (quotient) Breakeven point in units will also increase. Also, if we decrease the (denominator) Unit Contribution Margin, this effect will increase the variable costs, then the (quotient) Breakeven point in units will likewise increase.

The result of increasing of increasing the fixed costs and variable cost will cause an increase in the breakeven point in units. The Titanium models will notice a 47.7% increase in Breakeven point in units from 1415 to 2089. Likewise with the Carbonlite, the total breakeven point in units would increase from 786 to 1160 with is also a 47.7% increase. The total breakeven point in units for the product sales mix would now be at 3249 (2089 + 1160) which would then translate the total breakeven in dollar sales of 3,614,300. The company will generate a profit if the sales exceed the new breakeven point in sales dollars. Conversely, if the company does not reach this sales dollars amount the company will suffer a loss.

In conclusion, the above formulas show how a change by increasing the variable expenses by 10% and fixed expenses by \$50,000 can have a domino effect for the breakeven point. The \$50,000 increased in fixed costs and a 10% direct materials increase translate into a 47.7% of the breakeven units (from 2201 to 3249) and in dollars sales that would mean (from \$2,448,570 to \$3,614,300) of the product mix. Competition Bikes needs to be constantly monitoring these variables and fixed expenses as it can ultimately affect the company's break points based on the Cost-Volume-Profit Analysis.

References

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