Management accounting

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Cost volume profit analysis looks into the relationship between a firms fixed and variable costs and total revenues across a varying level of production. The model will give a predicted level of profit at a given level of production. There are many ways that CVP analysis can be useful for decision making, it is important to distinguish between the different applications of the Economists and Accountants interpretations, as well as other factors involved in decision making.

CVP analysis is used in management decisions when forecasting production levels. To use this model effectively, Management will look at different scenarios of output, prices and costs, and see where the model predicts the firm's revenues will cover its total costs. This point is known as the breakeven point. Management can investigate the effects of price increases, changing costs from fixed to variable such as salaries to commission based pay. Managers can also investigate the outcomes from decisions such as making components in house or buying in, retaining or replacing equipment and marketing decisions. They can also investigate the sales mix. By having a prediction of the effects of these variables, managers will be able to make better decisions, as they have more information.

CVP is a simplified model and thus has limitations to its analysis and predictions. When managers are aware of the limitations and how to correctly use CVP analysis it can be a powerful tool. Managers must be aware that there are assumptions that are made to simplify the CVP tool, as it cannot truly model the real business, as it would be far too complicated.

The economist's interpretation of the CVP graph, Figure 1, is based on two main assumptions, which explain the shape of the cost and revenue curves. The first assumption, which affects the revenue curve is that the firm is competing on price competition, this means that in order to increase sales, the firm must reduce the marginal selling price of the product. This causes the firm's revenue curve to level off, as the marginal revenue falls to ï¿½0, as in figure 1b. After this point the firm is selling at a negative price, causing the firm's total revenue to fall. The second assumption is based on the firms cost curve, is based on economies and diseconomies of scale. The firm's economies of scale cause the variable cost per unit to decrease as production increases, as in figure 1b.

This can be due to any of the economies of scale, such as purchasing, where a discount for bulk buying is received, managerial, where managers can become more specialised, financial where the firm is offered lower interest rates as there is a lower risk of lending. The Total cost curve will level off as these increasing returns to scale cause the production to reach a level of most efficient output. After this the firm will experience decreasing returns to scale, as the plant is operating at a higher production level than it was designed for, causing problems in production, such as bottlenecks in the production line. This causes the average unit cost to increase again, giving

the curve its shape. It is important to understand that Economists are trying to most accurately model real world situations, rather than create a tool for management decisions.

The accountants CVP model, figure 2, is based on a simpler interpretation of the cost and revenue functions, this is because Accountants are not concerned with provided an accurate representation of the cost and revenue functions, instead they wish to display the relevant ranges, figure 3, of production for the firm. As this is the information that is used for short-run decision making, as this is the time frame where the information is most useful for management decision making, information for longer term decision making is required for board level decisions, to do with the long term objectives of the company. The information that the firm uses to produce its cost and revenue curves is extracted from previous operating costs and revenues, this ensures that the information is reliable.

The Accountants cost function, is a straight line, which assumes that for each additional unit produced, a standard variable cost is incurred, the assumption that production will only be occurring in a relevant range means that the firm's production will not alter enough to cause increasing or decreasing returns to scale. The Accountant's interpretation of the fixed cost curve is different to the Economist's view because it meets the Y axis at a higher point, which indicates that the Accountants believe that firms are committed to a higher minimum level of fixed costs. This is because although a firm may reduce its fixed costs to a lower level, as in the Economist's interpretation, the firm can only do this by redundancies and shutting down plants.

As the Accountants model only represents a relevant range, the fixed costs cannot be reduced to this level in the short run, when this interpretation is extended outside of the relevant range, a stepped fixed cost and total function will be seen, as in figure 3. The other difference is that the revenue function is linear. This is because in the short run, firms cannot change the price of their products easily; it may also be because of firms competing on non-price, rather than price competition. As Accountants make no attempt to extend the revenue function outside of the relevant range, there is no need to model the firm's decrease in product price to increase demand.

The Accountant's interpretation of the Cost Volume Profit model is more appropriate for Management decisions, as management decisions are not concerned with long term information. This is because the Board of Directors will be making the firms long term decisions. The information that the Economist's model provides, includes a lot of information outside of this relevant range, this will affect the reliability of the data in the model. The data in the model will be less reliable as it is more difficult to accurately predict the behaviour of the cost and revenue functions, outside of the relevant range, as it is not based on past sales data. It will also be more expensive to compile the information needed as it is a more complex model. It can also be argued that some managers will find it difficult to interpret the Economists model, as the information will be more complex.

Managers may wish to extend the CVP model to cover longer term decisions, will need to be aware of the long term behaviour of fixed costs. In the long term, firms will have a greater control over fixed costs, they can expand capacity by increasing floor space, hiring more supervisors and upgrading or

purchasing new machinery. Which will give the firm's fixed cost line a step function. Other factors will also affect the firm's revenue and cost curves, such as advertising strategies, changes in political, environmental, social, economical, and legal factors, such as a change in VAT rate. These factors cannot easily be planned for and are not easily shown in long term CVP analysis, which is the main reason that CVP cannot accurately model long term production.

One of the features useful for decision making, is the ability to display the information in different methods, one of these is the Margin of safety. This is the difference between the expected sales and break even sales, expressed as a percentage of the expected sales. It shows management the level that sales can fall by before the company's revenue falls below the breakeven point. The information can also be displayed as two other charts. The first is a contribution chart, figure 4, in this chart, the fixed costs are shown as the difference between the variable cost line and the total cost line.

The total contribution is displayed as the difference between the revenue line and the variable cost line. It is useful for showing a total contribution level at any level of output. The other presentation is the Profit volume graph, figure 5; this graph is useful because the other two charts to not directly display the profit at any given level of production as it must be calculated. The P-V graph simply displays the firms profit or loss at any given level of production. These two graphs will be useful for management decisions concerned with contribution or profits at a given level of production. Once again, the economist's version of these two graphs would

be far too complicated, and the information will not be reliable enough to base management decisions on.

In the real world, firms will be producing multi products, and spreading the overhead costs across each of these products. A firm may wish to alter the CVP analysis to reflect their product mix. This is done by grouping production into batches. The batches revenue and variable costs will be defined as the total of the products in the batch. The values for the batch are then applied to the CVP chart in the same way as a single product.

For the CVP model to be used effectively by managers, they must be aware of the assumptions made whilst preparing and gathering the information. If management are not aware of the assumptions made in the data, then they will be unable to draw relevant conclusions from the information. The assumptions i are that all other variables remain constant; there is a constant sales mix, total costs and revenues are linear functions of output, profits are calculated using variable costing, the analysis only applies to the relevant range, costs can be divided into fixed and variable elements, it only applies to the short term, and fixed costs do not change.

In conclusion, the Accountant's interpretation of the CVP analysis, as shown by the underlying assumptions, will allow managers to develop a more relevant understanding of the information, so that it can be used more effectively in decision making. If managers tried to use the economists CVP graph, the cost of gathering and interpreting the data would be high, as well as making the information more difficult to understand and less reliable. In the real world, the Accountant's model may be considered too simplistic, as it relies on many assumptions and conditions, which are often not met. This

is why it important to understand that the Accountant's CVP model may not be applicable. For the CVP analysis to be effective, managers must be aware of the limitations of the model, otherwise they will be unprepared for any deviations from the outputs of the model.