

Applying the Lessons to Practice

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Introduction

As new accountants, you are preparing to or have already started applying the lessons you learned in school to actual practice. One of the first things you learn is that practice is not the sterile environment you frequently encounter in the classroom. The successful accountants have made the transition by incorporating what they've learned in class to the real world situations they encounter. The purpose of this paper is to show you a specific case where one of your classroom lessons is adapted to the realities of everyday business life.

All of you remember, no doubt, the class where cost-volume profit (CVP) analysis was first introduced to you. When investigating the economic feasibility of adopting a new product line, for example, you were told CVP analysis could organize the various elements related to this adoption so that you could make an informed decision about adoption. One of the assumptions you make when using this analysis is that there are no inventories. This assumption allowed you to investigate variable cost behaviors for both manufacturing and selling costs as the activities “units made” and “units sold” were equal to each other. But other assumptions, not explicitly made, do not recognize very real elements that can influence the usefulness of this type of analysis. Let’s consider the following case as an example of applying the lessons of class to a situation that you may encounter outside the classroom.

Cost-Volume Profit Analysis

Managers often are interested in the level of output at which the cost of committed fixed resources is covered by the profits earned from producing and selling goods and services. Cost-volume-profit (CVP) analysis is a tool commonly used by managers for this purpose. While CVP analysis is commonly used to examine how various “what-if” alternatives affect operating income, the notion of “breakeven” that is obtained from CVP analysis is frequently a point of particular interest to managers. Managers are interested in the breakeven point because by definition, the breakeven point is that quantity of output at which total revenues and total costs are equal, or the point at which operating profits are zero. At any volume of sales below the breakeven point, the product, service, or business operates at a loss. Increasing levels of sales above the breakeven volume generate increasing profits.

While breakeven calculated using conventional CVP approaches is an useful tool, it may not adequately reflect the needs of a variety of business enterprises, particularly small business enterprises. For small business, adequate cash flows are an important and integral component of success and survival. These businesses are generally more concerned with first ensuring viability in the short term, before they begin planning for the longer term. Ensuring that their business generates adequate cash flows to meet not just operating and other expenses, but often also for repayment of principal, debt servicing for equipment purchases, lease payments, etc., is a critical factor that dictates and governs their operations day-to-day. Also, sometimes managers and business owners may be more interested in understanding the relationship between volume of activity and cash or working capital, in contrast with CVP relationships based on accrual profits. Conventional breakeven and CVP analysis unfortunately, however, does not generally provide the relevant information needed for the purposes enumerated above. In this paper, we describe an approach that explicitly considers the cash needs of businesses. The breakeven obtained using this approach may be more relevant to the needs of a variety of businesses, and either independently or in conjunction with conventional CVP approaches provide more useful information for planning and financial analysis.

In its most basic form, conventional CVP analysis calculates the breakeven point in units or dollars by dividing the *total amount of fixed costs* by the contribution margin per unit or the contribution margin ratio, respectively. Contribution margin is the excess of revenues over variable costs, while contribution margin ratio is the percentage of contribution margin to the selling price or total revenues. The *total fixed costs* used in conventional CVP analysis consists of both fixed manufacturing and fixed selling and

administrative expenses. Typically, items such as salaries of personnel paid on a periodic fixed basis, rents, property taxes and insurance, legal and professional expenses, repairs and maintenance, fixed portion of utilities expense, selling expenses (apart from sales commissions which are normally variable) are included in computing the *total fixed costs*. In addition, one other significant item, namely, depreciation is also included in the computation of total fixed costs. The depreciation amount, normally is a significant portion of total fixed costs and includes depreciation on such items as machinery, buildings, and office equipment.

Conventional CVP analysis using the above approach gives a breakeven point at which accrual accounting profits are zero. As part of CVP analysis, managers typically can and do carry out “what-if” analysis, varying selling prices, fixed costs, and variable costs, individually or simultaneously, and based on their requirements and market factors settle at a volume of operations and breakeven that they are comfortable with. The breakeven thus obtained is part of a planning exercise that is useful to managers, and which permits managers to factor in an adequate margin of safety as part of the planning and budgeting exercise.

Conventional CVP analysis however, as can be observed from the description above ignores cash expenses such as periodic debt service payments for outstanding loans for investments in the business, repayments of outstanding loans for capital improvements, equipment purchases, etc. Moreover, by including depreciation expenses, and not including cash outflows for loan repayments the breakeven volume generated may provide distorted signals concerning meeting short term operating and other cash

requirements.¹ While properly projected cash budgets may provide some indications of periodic cash requirements, cash budgets do not provide any guidance on the volume of sales needed to generate the periodic cash requirements.

The limitations of breakeven volumes using conventional CVP methods discussed above can be overcome by using an approach that explicitly considers cash requirements of businesses. Henceforth, we use the expression “cash flow breakeven”(CFBE) to denote the breakeven obtained using this approach, in contrast with the “accrual breakeven” calculated using conventional CVP analysis. We use a hypothetical example to show how CFBE can be calculated, and to illustrate the differences between the various approaches.

Example The Henrico Co. is a small manufacturer of electronic components. Ted Baxter, CEO of the company is currently considering a proposal to establish a separate unit for manufacture of a new product. The company operates in a competitive market and Ted is concerned not just with the long term economic viability of the project, but also with making sure that the project can generate sufficient cash flow in the short run to meet operating and debt service requirements. Ted has made the projections described below. He is however, not certain if the sales volume he has projected for the product would materialize and wonders how much of a cushion, if any, he may have in terms of meeting his cash needs on a monthly basis.

Projections:

Estimated Sales Volume	140,000 units per month
Selling Price	\$ 6 per unit
Variable costs	\$ 2 per unit
Fixed Costs (excluding Depreciation)	\$ 430,000 per month
Depreciation expense	\$50,000 per month
Principal loan repayment	\$120,000 per month for the next 5 years.
Tax Rate	20%

¹ Some textbooks calculate a cash breakeven by simply deducting depreciation expense from total fixed costs. This method still does not take into account a firm’s periodic cash requirements for debt servicing and may actually provide distorted information, particularly for small businesses concerning the economic viability of a firm.

Calculations:

$$\text{Conventional Accrual Breakeven} = \frac{\text{Total Fixed Costs (including depreciation)}}{\text{Contribution Margin (per unit)}}$$

$$\text{Total Fixed Costs (including Depreciation)} = 430,000 + 50,000 = 480,000$$

$$\text{Contribution Margin per unit} = 6 - 2 = \$4 \text{ per unit}$$

$$\text{Breakeven Volume} = \frac{480,000}{4} = 120,000 \text{ units per month}$$

$$\begin{aligned} \text{Margin of Safety} &= \frac{(\text{Expected Volume} - \text{Breakeven Volume})}{\text{Breakeven Volume}} \\ &= \frac{(140,000 - 120,000)}{120,000} \\ &= \frac{20,000}{120,000} = 16.67\% \end{aligned}$$

Cash Flow Breakeven (CFBE):

$$\text{Cash Flow Breakeven} = \frac{\text{Fixed Costs} + \text{Principal Payment}}{\text{Contribution Margin (per unit)}}$$

$$\text{Fixed Costs} = 430,000$$

$$\text{Principal Payment} = 150,000^2$$

$$\text{Contribution Margin per unit} = 6 - 2 = \$4 \text{ per unit}$$

$$\text{Cash Flow Breakeven Volume} = \frac{(430,000 + 150,000)}{4} = 145,000 \text{ units per month}$$

$$\text{Margin of Safety} = \frac{(\text{Expected Volume} - \text{Breakeven Volume})}{\text{Breakeven Volume}}$$

² Principal payments must be made from profit after taxes. Since the tax rate is 20%, the company must have total before-tax income of \$150,000 [(\$120,000)/(1-0.2)] to make principal payments of \$120,000 after taxes.

$$= \frac{(140,000 - 145,000)}{120,000}$$

$$= \frac{-5,000}{120,000} = -4.17\%$$

Another Text Book Approach - Cash Breakeven:

$$\text{Cash Breakeven} = \frac{\text{Total Fixed Costs (excluding depreciation)}}{\text{Contribution Margin (per unit)}}$$

Total Fixed Costs (excluding Depreciation) = 430,000

Contribution Margin per unit = 6 - 2 = \$4 per unit

$$\text{Breakeven Volume} = \frac{430,000}{4} = 107,500 \text{ units per month}$$

$$\text{Margin of Safety} = \frac{(\text{Expected Volume} - \text{Breakeven Volume})}{\text{Breakeven Volume}}$$

$$= \frac{(140,000 - 107,500)}{120,000}$$

$$= \frac{32,500}{120,000} = 27.08\%$$

The calculations above illustrate the differences between conventional approaches to calculating breakeven and our cash flow approach. The results show that the breakeven using conventional CVP (120,000 units per month) approaches is lower than the CFBE (145,000 units per month). As can be seen from the calculations, this is because monthly cash requirements for debt servicing that were required were greater than the depreciation expense (as they usually are for most businesses). By excluding these cash payments and including depreciation, the conventional approach does not provide all relevant information that small businesses may need. In contrast, our approach specifically includes all

cash needs, including repayment of outstanding loan principals and hence lets businesses know the volume of sales needed to ensure that their cash requirements are fully covered. From an economic perspective the project appears profitable as evidenced by the conventional breakeven. From a cash flow perspective, however, the results obtained from our approach shows that Ted Baxter and the Henrico Co. may have to scaleback some operating expenses, or increase sales volume to meet monthly cash requirements. The third approach (cash breakeven) suggested in some textbooks excludes both depreciation expense and debt service payments. This breakeven is considerably lower, but businesses need to be forewarned that basing decisions on the breakeven calculated using this approach may be dangerous both short and long term.

Summary

In this paper we develop an approach to breakeven analysis that we feel provides more relevant information, particularly for small businesses than conventional approaches to breakeven analysis. We do not however, favor an “either or” approach to breakeven. In our view, a firm can benefit from the information provided by both approaches.

- ◆ The conventional approach lets businesses know if their business is viable long term. Depreciation is an important expense and should be considered in breakeven calculations.
- ◆ The cashflow approach to breakeven suggested by us provides firms with different but equally relevant information. It explicitly lets businesses know the volume of sales necessary to cover periodic cash

needs. Given that a significant portion of failures in small businesses is because of poor cash planning, the information that our approach provides is important to firms and should be used in the planning process.

- ◆ The cashflow approach also generally provides a better and more real margin of safety than the breakeven using conventional approaches. Given that in most cases loan payments are greater than depreciation expense, the CFBE will be greater than the conventional breakeven. Therefore, if businesses can comfortably generate sales greater than the CFBE, or operate at the level of CFBE, they will also be making real economic profits ensuring longer term business viability also.
- ◆ The CFBE while providing a rough and easy way to look at cashflow requirements / cash flow issues for the short term, can also be used with banks to show that not only is the project viable for the long term, but also that the project can generate enough cash flows to meet short term debt service requirements.

Conclusion

This is only one example of many you will encounter beginning almost immediately upon finishing your classes. Besides the specific example given in this paper, we hope you will take one more thing from this paper. And that is, as new accountants, you must be aware that in everything you do, one of the first things that must be considered is how the reality of your “real-life” circumstances differs from the sterile environment of the classroom. If you are not aware of differences or are simply unsure,

ask those with experience. You will find out that, while you may no longer be in the classroom, but you are still learning. The best accountants, in fact, never stop learning.