



## **ARE WE MAKING ANY MONEY OR NOT? MONTHLY BREAK-EVEN ANALYSIS FOR SMALL RETAILERS**

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### **Abstract**

Many small business retailers experience difficulty when they attempt to measure the short-term profitability of their businesses and some are uncertain whether the businesses have earned any profits at all in a given month. In the absence of other practical measurements, these retailers often rely on short-term cash flow as an informal profitability surrogate, which sometimes leads to inaccurate conclusions. This article proposes and demonstrates the calculation of a monthly break-even point, expressed in sales dollars, which can serve as a control standard for determining whether a profit was made in a particular month. The monthly break-even point also provides an estimate of the level of the profit (or loss). Calculation of the break-even point is simple, uses data readily available to small business operators, and has greater practical value for many retailers than the standard, one-product version of break-even analysis that is provided by most business texts.

### **Are We Making Any Money or Not? Monthly Break-Even Analysis for Small Retailers**

#### **Introduction**

Small business retailers often find it difficult to measure their short-term profitability because many of them lack the accounting skills necessary to prepare income statements and feel they can afford an accountant's services only once a year, when the annual tax return requires a precise calculation of profits. As a result, these managers may not know until year's end whether they are actually making profits; thus, they are unable to determine now whether they need to make changes in their operation of their businesses.

Although annual accounting profits are regarded as the primary measure of a firm's performance (Longenecker et al., 1997), most small business operators need more frequent profitability measurements in order to recognize the existence of problems and deal with them in a timely fashion.

The need for a short-term measure of profits leads many small business operators to rely on an informal analysis of monthly cash flows. They reason, quite logically, that if cash receipts for a particular month exceed expenditures, the business *must have* made money. And, extending the assumption, a business that has positive cash flows most months can reasonably be expected to be profitable over longer periods of time.

It has been suggested that a significant proportion of inexperienced small business operators don't really understand that profit and cash flow are not the same thing (Hatten, 1997; Longenecker et al., 1997). Since profit, by its simplest, most basic, definition, is simply the difference between revenues and costs, these managers reason that a cash surplus after some operating period has to be a profit for that period. In the long run, this reasoning is sound; in the short run it breaks down because many cash expenditures, such as wholesale purchases of products, are made before the products are sold, rather than during the day or month retailers sell them. Thus, a business might be judged "profitable" in terms of positive cash flow eight months in a given year and actually be unprofitable for that year if major expenditures for materials, inventory, repairs, or annual insurance premiums occur in the remaining four months.

Considering the difficulties of measuring short-term profits accurately, it is understandable that many small business operators rely on cash flow as a surrogate measure of profits. They recognize a need for some sort of performance measurement and, in the absence of other measurements, cash flow is judged to be better than nothing (Hatten, 1997).

The need for a reliable short-term measure of profit performance is probably most critical for inexperienced managers, particularly those who have operated their newly created or newly acquired businesses less than a year and have not yet had their profit measured by an annual income statement. With the knowledge that small business failures are most common in the early years of the businesses' existence (Zimmerer & Scarborough, 2002), these managers are particularly concerned with how well they are doing. They need information about their profitability to indicate, to themselves and other stakeholders, whether or not the business is headed for success (Steinhoff & Burgess, 1993).

### **The Role of Management Control Standards**

When managers identify a criterion for measuring success in any performance area (such as profitability), they are establishing a control standard, which is the first step in the management control process. Controlling was identified long ago as a fundamental management responsibility when Fayol (1916) defined it as "verifying whether everything occurs in conformity with the plan adopted." Fayol's definition linked controlling to planning, an association that has endured over the years (Donnelly et al., 1992; Hellriegel & Slocum, 1986; Koontz, 1958). A generally accepted explanation of management control identifies it as a four-step process, consisting of (1) setting standards, (2) measuring performance, (3) comparing the

performance to the standards, and (4) taking appropriate action. Some sources contract or expand this model slightly by combining the first and second steps or by dividing one or more of the steps to provide greater detail (Glueck, 1980; Griffin, 1987; Koontz, 1958; Mockler, 1970) but the elements are essentially the same in all descriptions of controlling.

Management control's relationship with planning has two basic applications. The first is concerned with ensuring that plans are carried out in the intended manner and largely involves managers' supervision of their subordinates. The second control application is concerned with outcomes and has seen its greatest use in the functional areas of finance, production, and purchasing, where many of the results are quantifiable and lend themselves to the setting of standards and measuring of results (Gigliani & Bedeian, 1973; Hellriegel & Slocum, 1986; Tannenbaum, 1968; Thompson, 1978). In small businesses, of course, there is a very high likelihood that the same individuals will be responsible for managing all these functions, in addition to making strategic decisions.

The second basic control application, concern with outcomes, is relevant to small business operators' need to measure their short-term profits. The absence of the first step of controlling, establishing a standard, creates much of the difficulty encountered by small business retailers when they attempt to measure their short-term profitability. Given the inaccuracy of using simple cash-flow analysis for this purpose, they need a different standard against which to measure their performance.

### **Break-Even Analysis**

We propose that break-even analysis can be used to derive a short-term control standard for measuring whether profits have been made. Break-even analysis is a well-known technique originally devised to calculate the amount of production and/or sales necessary for a business to begin making profits. The break-even point (BEP), which may be expressed in terms of product units, dollars of sales, numbers of customers, percentages of occupancy, or other measurements, is the level of sales at which a business neither makes a profit nor suffers a loss; in other words, it "breaks even." Stated another way, at the break-even point, a firm's sales revenues are equal to its total expenses (Allen, 1995; Greenfield, 1989; Kuehl & Lambing, 1994; Siropolis, 1990; Zimmerer & Scarborough, 2002).

To calculate the BEP, one must know the total amount of an organization's fixed costs for some period of time, the price at which it sells its products, and its cost of acquiring and selling each product unit (Anderson & Dunkelberg, 1990; Zimmerer & Scarborough, 2002). The difference between each sold product's cost and its selling price (referred to as its contribution margin), is applied to the organization's fixed costs until enough products have been sold to pay those costs. The level of sales necessary to pay the fixed costs is the BEP. Once the BEP has been achieved, the contribution margin on each additional unit sale is a profit (Larson, et al., 1999).

Fixed costs are usually described as expenses that are not related to the volume of sales or production; that is, they must be paid even if a business has no sales. These include expenses such as rent, insurance, utilities (other than power to operate production equipment), management salaries, security, and routine maintenance of facilities. Despite their name, fixed

costs are not always the same in every operating period because some of them, such as utility costs for heating and air conditioning or the number of hours of wages earned by employees, tend to vary (Anderson & Dunkelberg, 1990; Bangs, 1989; Hammel, 1988; Hatten, 1997; Steinhoff & Burgess 1993; Zimmerer & Scarborough, 2002).

Some expenses are difficult to categorize because they contain elements of both fixed and variable costs. An example is advertising in the yellow pages of a telephone directory. While it is reasonable to assume that such an ad increases sales, it is difficult to establish the precise relationship between the ad's cost and the assumed sales increase. Some costs are actually semivariable; that is, they are fixed over some range of sales or production and then increase in increments if that level is exceeded. They then remain fixed until some higher production or sales level is reached. An example is the hiring of an additional salesperson when the existing sales force has reached the limit of its selling capacity. In the calculation of a BEP, semivariable costs are usually placed in the fixed-cost category (Anderson & Dunkelberg; 1990; Bangs, 1989; Steinhoff & Burgess, 1993).

Break-even analysis is described most often as a planning technique. Potential creditors and investors are usually interested in the projected BEP when their funds are being solicited for the creation of new businesses or the expansion of existing firms. It is also useful when determining the price to be charged for a product, although other factors must also be considered (Greenfield, 1989; Horngren & Harrison; 1992; Steinhoff & Burgess, 1993).

The assumptions of break-even analysis are (1) that all costs are known and can be divided accurately into fixed and variable categories; (2) that the costs will be the same for all levels of sales and/or production activity (within some range); and (3) that all units of the product will be sold at the same price regardless of the sales volume. The accuracy of a BEP calculation varies with the extent to which these assumptions are met, but the formula is considered to be fairly robust (i.e., it usually produces reasonably accurate results even if all the assumptions are not met) within certain ranges of activity (Anderson & Dunkelberg, 1990; ; Bangs, 1989; Hammel, 1988; Hatten, 1997; Steinhoff & Burgess, 1993; Zimmerer & Scarborough, 2002).

### **The Limitations of Break-Even Analysis**

Despite its near-universal inclusion in business texts, the application of break-even analysis presents problems for many managers. These are amplified for small business operators, especially those with relatively little management experience. The first application problem is that almost all explanations of the concept provide examples that consider only one product (see, e.g., Allen, 1995; Greenfield, 1989; ; Hatten, 1997; Steinhoff & Burgess, 1993; Zimmerer & Scarborough, 2002). This simplifies the explanation, but may lead retailers who sell many products, with varying prices and markups, to conclude that break-even analysis is impractical for them.

Another problem for small business managers is determining and forecasting their precise costs. It is easy, for example, to overlook infrequent but unavoidable costs such as tire replacement on a delivery truck and difficult to predict how often the truck will have to be repaired (as well as the cost of the repairs). Continual increases in identified costs complicate this problem even further. This is particularly true for inexperienced managers (Agins, 1984; Greco, 1996; Greenfield, 1989).

We propose that these problems can be mitigated to a degree that will allow the calculation of a relatively accurate monthly BEP for small retailers who sell a variety of products with varying markups. The calculations are simple and use cash flow information that already exists in most businesses. Once determined, the monthly BEP will answer the “did I make a profit or not?” question and provide an estimate of the amount of those profits (or losses).

### **Using The Break-Even Point as a Control Standard**

As described above, cash flows have somewhat erratic patterns that make them unreliable as measurements of profit in a short period of time (such as a month). The effects of cash flow variations can be minimized, however, by averaging the cash flow figures over a longer time period. A monthly BEP is a useful control standard that allows an easy determination of whether profits were made (acceptable performance) or whether losses were sustained (unacceptable performance, which may require corrective action) in a given month. The BEP also furnishes a reasonably accurate estimate of the amount of profits or losses. The proposed technique is explained most simply by using an example, which is provided below.

### **An Example of a Monthly Break-Even Point Calculation**

Speedeaze is a fictitious convenience store that sells gasoline, automotive supplies, delicatessen food, packaged snacks, beer, soft drinks, and a limited variety of groceries. The store’s product line includes hundreds of items, which are priced to achieve a variety of profit margins. Many of the items are purchased by the business in quantities large enough to last several months, in order to take advantage of quantity discounts offered by suppliers, while others, such as dairy products, are received daily in small quantities. The owners, Chad and Gerrie Myers, purchased the business from its founder and have operated it for three months. Positive cash flows have been achieved each month and the Myers believe the business was profitable every month, but they are not certain. They would like to know what monthly level of sales is required for the business to be profitable – their monthly BEP. This value can then be used as a control standard to determine whether they need to make changes in their operation of the store. Before the monthly BEP can be calculated, the store’s fixed-cost, variable-cost, and revenue values must be determined.

#### **Determination of Fixed Costs**

Table 1 displays the amounts spent by the Myers on fixed costs during the three-month period. As is frequently the case, expenditures for only one of these so-called “fixed” costs – rent – were constant every month.

**Table 1**

**Monthly Expenditures for Fixed Costs, January Through March**

Categories	January	February	March	Monthly Average
Wages	\$ 7,799	\$ 6,986	\$ 7,360	\$ 7,382
Accounting Fees	408	0	0	136
Maint./Repairs	271	242	505	339
Rent	3,500	3,500	3,500	3,500
Utilities	1,030	1,360	1,283	1,224
Phone	162	147	156	155
Supplies	275	126	173	191
Advertising	530	460	494	495
Insurance	0	0	1,800	*150
Bank Charges	56	72	65	64
Totals	\$14,031	\$12,893	\$15,336	\$13,636

\*This figure is derived by dividing the annual \$1,800 payment by 12.

The monthly average of total fixed costs (\$13,636) will be used to calculate the BEP. This value will be subject to future revision as the Myers monitor their payments for fixed expenses each month and acquire more cost data and experience.

**Determination of Variable Costs**

Because Speedeaze sells a variety of products and uses many different price markups, it is appropriate to calculate the store's average monthly cost for the entire combination of products. This average will then be used to determine an average markup percentage on all products for the break-even calculation. Speedeaze's expenditures for products during the three-month period are displayed in Table 2.

The monthly average of total variable costs (\$49,231) will be used to calculate the BEP. This value will also be subject to future revision as changes occur in the product mix and the Myers become better informed about seasonal effects on sales of various products.

**Determination of Average Revenues and Contribution Margin**

A contribution margin ratio is required to calculate a break-even point in sales dollars. Because Speedeaze uses many different markups on its numerous products, an average markup and contribution margin ratio is appropriate for the break-even calculation. Speedeaze's cash receipts from the three months' sales revenues are shown in Table 3.

**Table 2**

**Monthly Expenditures for Products, January Through March**

Product Categories	January	February	March	Monthly Average
Gasoline	\$34,712	\$28,195	\$36,023	\$32,977
Automotive Supplies	780	658	755	731
Ice	150	124	205	160
Deli Food	6,513	5,842	6,745	6,367
Packaged Snacks	1,215	946	1,118	1,093
Grocery Products	966	887	806	886
Dairy Products	451	386	412	416
Soft Drinks	3,833	3,013	3,610	3,485
Beer	3,280	2,766	3,303	3,116
Totals	\$51,900	\$42,817	\$52,977	\$49,231

**Table 3**

**Sales Revenues, January Through March**

Sources	January	February	March	Monthly Average
Cash Sales	\$62,056	\$52,547	\$64,667	\$59,757
Receipts from Credit Card Sales	5,655	4,282	4,991	4,976
Returned Checks	(286)	(325)	(340)	(317)
Totals	\$67,425	\$56,504	\$69,318	\$64,416

The formula for calculating the BEP in dollars of sales is

$$\text{BEP (\$Sales)} = \text{Fixed Costs (\$)} / \text{Contribution Margin Ratio}$$

Where:

$$\text{Contribution Margin Ratio} = \text{Percentage Markup on the Selling Price of the Products}$$

Applying the average monthly sales revenues and variable costs determined above, the contribution margin ratio for Speedeaze is calculated as:

$$\text{Contribution Margin Ratio} = 1 - (\text{Average Variable Costs} / \text{Average Sales Revenues})$$

$$= 1 - (49,231 / 64,416)$$

$$= 0.24 \text{ (or 24\%)}$$

The interpretation of the contribution margin value is that, on average during the three months, 76 cents of each sales dollar were required to pay the cost of the sold products and the remaining 24 cents (the contribution margin) could be used to pay Speedeaze's fixed costs. If the BEP sales level was achieved in a given month, the business made 24 cents profit on each additional dollar of sales.

### **Calculation of Monthly Break-Even Point**

Applying the formula provided above, the monthly BEP for Speedeaze is calculated as:

$$\begin{aligned}\text{BEP (\$Sales)} &= \text{Fixed Costs/Contribution Margin Ratio} \\ &= \$13,636/0.24 \\ &= \$56,817\end{aligned}$$

The Myers may now conclude that their business is profitable in any month that has sales receipts exceeding \$56,817.

### **Conclusions About Speedeaze's Monthly Profitability**

Comparing Speedeaze's monthly sales revenues (Table 3) to the calculated BEP, we are able to determine that the business was profitable in January and March, but unprofitable in February. This conclusion about February could not have been reached through informal cash flow analysis because the business had a positive cash flow each of the three months. Using the calculated monthly BEP, however, the owners can determine whether or not their business is profitable in a given month simply by comparing the calculated BEP value with their sales revenues for the month. An estimate of the dollar amount of profits is also provided. As the managers accumulate additional cost and sales data in future months, the BEP value can be refined to accommodate seasonal demand factors and significant changes in product mixes.

### **Discussion**

The technique described above is clearly no replacement for the traditional income and cash flow statements used to report a firm's financial performance over some period of time. These

records are still required by small business retailers (as well as other firms) to determine the precise level of income. The use of cash flow data to calculate profitability will never be perfectly accurate because the costs of some products will occur in different periods than the receipt of their sales revenues and some fixed costs are not paid at even intervals. As a result, a business may very well experience cash flow problems during periods that are profitable and have positive cash flows when no profits are made.

In spite of these limitations, we conclude that break-even analysis, conducted in the manner described above, may be very useful as a control standard for small business retailers who want to be able to make a reasonable judgment about whether or not their business has made money in

a particular month. The inaccuracies inherent in the use of cash flow information for this purpose are mitigated by the use of monthly averages and will be reduced even more as the managers calculate the averages over longer periods of time. Additionally, small retailers are more likely, in comparison to large firms, to keep small inventories; this increases the likelihood that payments to suppliers and revenues from retail sales of a product will occur in the same month. If most customers pay cash, as in the fictitious business described above, the accuracy of a monthly BEP is increased even more.

We propose that the calculation and use of monthly break-even points can be a valuable control device for small business operators, provide they recognize it for what it is – simply another indicator of their business' performance in the short run – and do not attempt to substitute it for traditional financial statements and analyses.

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