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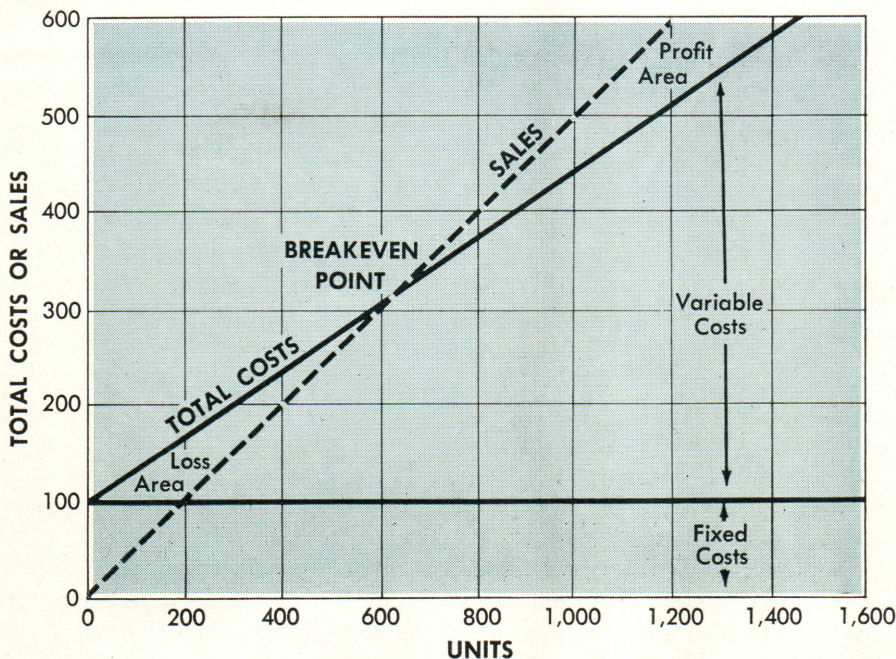
## A NEW APPROACH TO THE BREAKEVEN CHART

*The conventional breakeven chart, because it must assume a fixed set of conditions, can be a very unreliable tool for prediction. A dynamic breakeven chart, based on markup on variable costs, is safer and far more valuable as a working management tool.*

*by William E. Arnstein  
and Edgar A. Mack*

*S. D. Leidesdorf and Co.*

**EXHIBIT I**



**T**HIS article introduces a flexible breakeven chart, one useful in profit planning and control.

Breakeven analysis is not new. Its goal is to focus attention on the relationship among volume, price, and profit. Experience shows, however, that the classic breakeven chart often fails as a working tool for executives. A more helpful technique is therefore needed. But first let us take a close and critical look at the classic chart.

We are all familiar with the straight-line breakeven graph. Period costs, variable costs, and sales revenue are charted in relation to volume expressed in units, per cent of plant capacity, or sales dollars. Exhibit I (left) is an example of the straight-line breakeven chart.



A chart of this type necessarily assumes a fixed set of conditions: a given product mix, unit selling prices, and a rate (or level) of marketing expenses. Unfortunately, the classic breakeven chart lends itself to *misuse*, particularly when management fails to clearly understand the underlying assumptions, or fails to remember them.

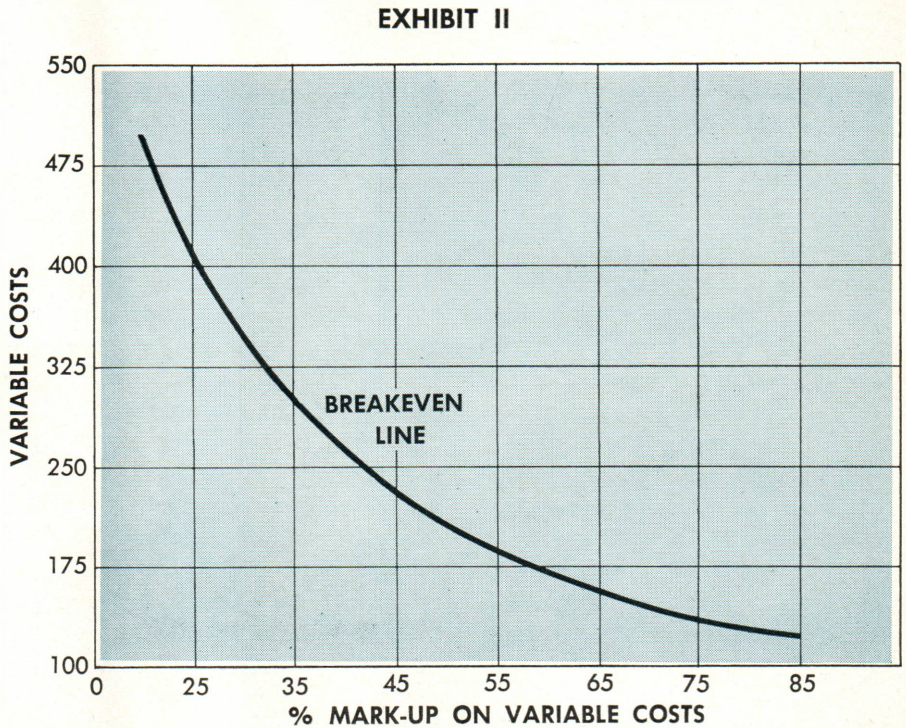
**Dangers of chart**

Here is how this chart might be misused—unintentionally—in decision making. A greater and *seemingly* profitable volume is planned, but by means differing from the fixed conditions of the chart—by changing the product mix and emphasizing lines with low profit margins; or by shaving sales prices; or by increasing promotion and advertising expenses. The volume goal is reached, but profits fall far short of the expectations appearing on the chart. The writers are familiar with instances in which the increased volume actually showed lower profits than the original volume.

What should have been done, of course, was to prepare a new breakeven chart reflecting the new assumptions. This only points up another disadvantage of the classic chart—*inflexibility*.

A novel but useful approach to breakeven analysis considers the breakeven point as the percentage markup on *variable* costs required to recover all costs. Note the markup percentage refers to the markup on variable costs, not that related to selling price.

To construct a breakeven chart based on this concept entails four relatively easy steps. The analyst determines period costs, selects several likely levels of variable costs, and computes the relationship of period costs to each variable cost selected. These percentages are the breakeven points, that is,



they show the markup on variable costs required to break even. The last step is plotting the percentages on a chart.

Exhibit II illustrates a breakeven chart of this type. In Exhibit II, period costs are \$100,000, and the variable costs range from \$100,000 to \$500,000, in steps of \$20,000. As was to be expected, the breakeven points line up as a curve.

The chart in Exhibit II attains flexibility without danger of unintentional misuse, because it does not assume a fixed set of conditions.

Suppose a company contemplates a different product mix, or buying rather than manufacturing finished products—the breakeven point, and the profitability of a particular level of volume, fluctuates with each contemplated change in conditions. To denote the new breakeven point, etc., a new chart is normally needed.

If more than one change in condition is being considered, several charts are needed. By using the markup on variable costs approach, each new breakeven point can be quickly calculated once the new total of variable costs is known.

The breakeven calculation in Exhibit II has the advantage of not being coupled to sales. It is not necessary to project unit selling price, product mix, and total sales to compute breakeven points. Under the markup approach the total sales required to break even is found afterwards—by applying the markup percentage to forecasted variable costs.

**Other capabilities**

Exhibit III (page 62) illustrates a chart showing the markup on variable costs required to earn a *spe-*



The typical breakeven chart is seldom used by executives . . .

cific profit. In this example, the planned profit is \$10,000 and the period costs are \$100,000 (as in Exhibit II). The desired profit is built into the required markup by adding profit to period costs before computing percentages.

A chart of this type is not limited to a single profit plan. By simply having several curves on a chart, one chart can show the required markup for several profit plans—\$10,000, \$20,000, \$30,000, etc. Similarly, one chart can indicate the required markup for breaking even at several levels of fixed costs. This is especially useful if a rise in fixed costs is anticipated. It is evident then that a single chart can display the required markup for several combinations of profit plans and

period costs—and all in relation to any level of variable costs.

A desirable feature of a multi-curve chart is its ability to give information not specifically plotted in it. For example, a chart which shows several profit plans can be used to quickly approximate, by interpolation, the required markup for a profit plan not drawn on the chart. Another example is seen in Exhibit III. If fixed costs were to unexpectedly rise 10 per cent (the exact relation of projected profit, \$10,000, to fixed costs, \$100,000), then the profit plan curve can be used to determine the markup to break even. If fixed costs were to rise 5 per cent, the markup to break-even can be estimated by interpolation.

The typical breakeven chart is seldom used by executives, either because they don't fully understand it or because they recognize its inherent limitations. With meager control tools for guidance, especially in smaller companies, managers make decisions on experience, on an indefinable "feel" of the business. Sometimes this is enough. More often, however, it is not, and a breakeven chart would help, providing it is easy to use, but not to misuse.

In contrast to the classic breakeven chart—which summarizes a fixed set of assumptions or reports past results—the chart recommended here is a working tool. It is a *reliable* device designed for *continual* use.

EXHIBIT III

