4 Multiproduct Break-Even Point

When B.E.P. of a single product is calculated, sales price corresponds to the price of this product. However, in reality firms sell many products. It is easily understood that when different products are offered by a company, the estimation of the values of variables used in B.E.P. formula (sales price, variable costs) becomes a complicated issue, since the weighted average of these variables has to be computed.

An important assumption in a multiproduct setting is that the sales mix of different products is known and remains constant during the planning period. The sales mix is the ratio of the sales volume for the various products. To illustrate, let's look at Quick Coffee, a cafeteria that sells three types of hot drinks: white/black coffee, espresso and hot chocolate.

The unit selling price for these three hot drinks are €3, €3.5 and €4 respectively. The owner of this café wants to estimate its break-even point for next year. An important assumption we have to make is that current sales mix will not change next year. In particular, 50% of total revenue is generated by selling classic coffee, while espresso and hot chocolate corresponds to 30% and 20% of total revenues respectively. At the same time, variable costs amount to €0.5 (white/black coffee), €0.6 (espresso) and €0.7 (hot chocolate). We have to compute the weighted average for these two variables, selling price and variable costs (Diagram 3):

PRODUCT	PRICE (€)	PROPORTIONAL TO TOTAL REVENUE	WEIGHTED AVERAGE
COFFEE	3.0	50%	
ESPRESSO	3.5	30%	
HOT CHOCOLATE	4.0	20%	**3.35**

PRODUCT	VARIABLE COST (€)	PROPORTIONAL TO TOTAL REVENUE	WEIGHTED AVERAGE
COFFEE	0.5	50%	
ESPRESSO	0.6	30%	
HOT CHOCOLATE	0.7	20%	**0.57**

Diagram 3: Weighted Average for some products

Applying the B.E.P. formula – company's fixed costs are €55,000 – gives us 19,784 units.
B.E.P. = €55,000 / (€3.35 – €0.57) = 19,784 units.

This computation implies that Quick Coffee breaks even when it sells 19,784 hot drinks in total. To determine how many units of each product it must sell to break even we multiply the break-even value with the ratio of each product's revenue to total revenues:

Classic Coffee:	19,784 × 50% = 9,892 units,
Espresso:	19,784 × 30% = 5,935 units and
Hot Chocolate:	19,784 × 20% = 3,957 units.

The above analysis can be used to answer a variety of planning questions. We can also vary the sales mix to see what happens under alternative strategies.