Case Study – Break-Even Analysis

Having received both the cash flow forecast (Feb Issue) and the financial analysis (March Issue) Philip Rose has become much more aware and now has a more clear understanding of his financial statements.

You may recall in the earlier case he was considering investing £27000 in a new childrens play area.

He has decided to partially fund this by long term finance from the bank. In addition to the cash flow forecast and profit projections previously prepared, his small business advisor (bank employee) has mentioned the concept of break-even.

The case now considers the factors that underpin this concept and its application to his accounts. He has recently received his draft profit and loss account for year ended 31 December 2005 and this shows:

Philip Rose Trading as White Swann Inn
Trading and Profit and Loss Account for the
Year Ended 31 December 2005

	£	£
Sales		325100
Stock at 1 January 2005	15400	
Add purchases	157150	
	172550	
Less stock 31 December 2005	16100	
Cost of sales		156450
Gross profit		168650
Expenditure		
Wages	32100	
Heat, light and power	8750	
Cleaning and maintenance	6500	
Consumables	1530	
Insurances	1350	
Rent	28500	
Business rates	7650	
Bank charges	800	
Motor vehicle running costs	1420	
Depreciation		
Fixtures and fittings	5000	
Kitchen equipment	1500	
Motor vehicles	3125	
		98225
Net profit for year		£70425

* Includes major re-decoration of bar area

Break-even analysis is a technique that is part of CVP analysis (Cost, Volume, Profit).

These techniques are based on the principle of marginal costing that relies on the way in which cost behaves at varying levels of output or activity.

Any such analysis requires the identification of both fixed and variable costs within a businesses cost structure.

It is clear that the business incur both fixed and variable costs which are defined as:

Fixed Cost

"The cost which is incurred for a period, and which, within certain output and turnover limits, tends to be unaffected by fluctions in the levels of activity."

eg rent, rates, salaries.

Variable Cost

"Cost which tends to vary with the level of activity"; in this case purchases.

Other terminology linked to this type of analysis includes:

Contribution

The value of sales less variable costs.

Break-Even

That point at which total contribution is equal to fixed cost and neither a profit nor loss is made.

The total fixed costs in many businesses tend to be high in relation to total cost and therefore a business must maintain a level of activity that not only contributes to covering fixed costs but provides an acceptable, or target level of profit.

To apply this technique to Philip's accounts we need to identify both the fixed and variable costs within the business.

This analysis is based on the accounts for year ended 31 December 2005.

After much discussion with Philip it was agreed that:

- one third of the employee costs are variable (he has some core staff ie: full-time barman – considered a fixed cost)
- 40% of the heat, light and power is variable
- one third of the motor vehicle running costs are fixed
- consumables are considered variable
- cost of sales is the true variable cost
- all other costs are considered fixed

From this information the following schedule was produced:

Cost	**Fixed**	**Variable**
	£	**£**
Cost of sales		156450
Wages	21400	10700
Heat light and power	5250	3500
Cleaning and maintenance	6500	
Consumables		1530
Insurances	1350	
Rates	7650	
Rent	28500	
Bank charges	800	
Motor vehicle running costs	473	947
Depreciation	9625	
	£81548	£173127

It is clear that with such high fixed costs profit is most sensitive to changes in volume.

For example the previous year turnover had been £310420 with profits of £51944, whereas this current year turnover has advanced to £325100 and profits to £70425, fixed costs have remained fairly constant.

In order to consider the level at which the business breaks even we need to determine the contribution.

This is expressed as sales less variable costs:

£325100 - £173127 = £151973

then:

Break-even point (in value of turnover)

$$= \frac{\text{Fixed Costs}}{\text{(Contribution / sales)}}$$

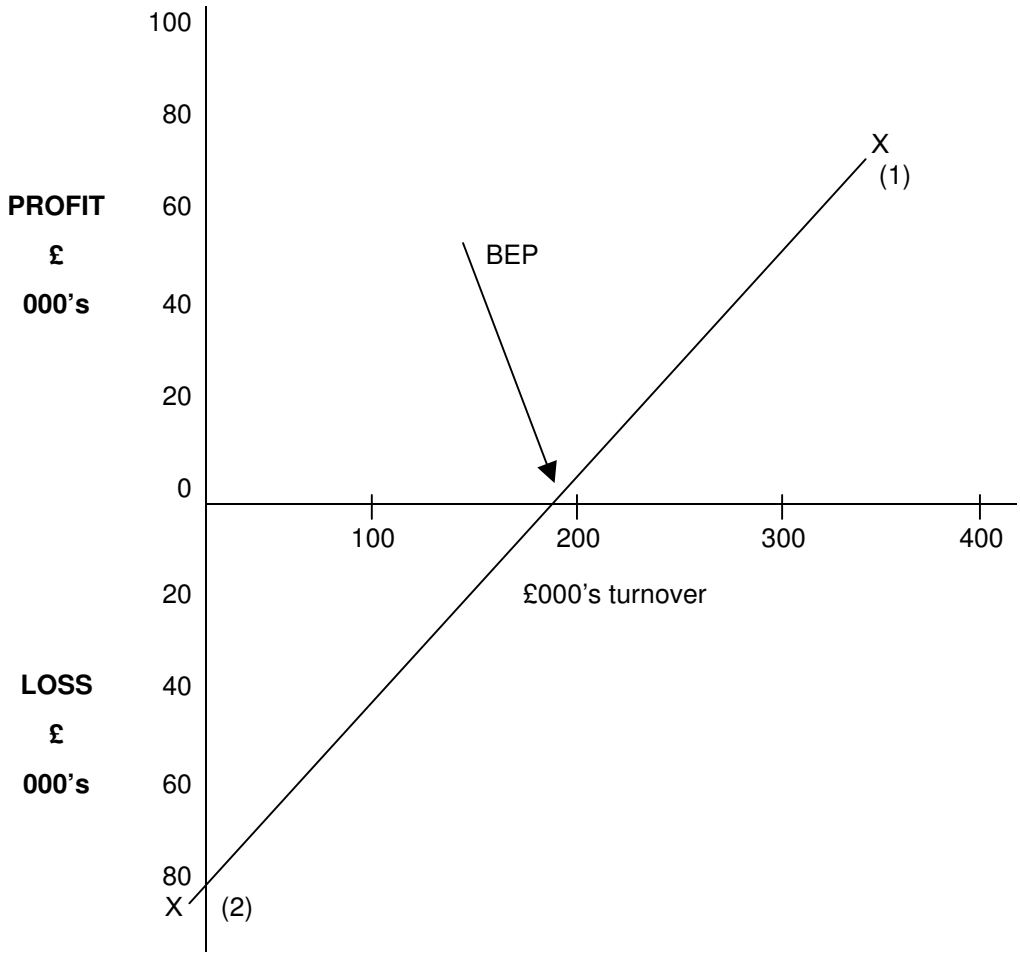
$$= \frac{£81548}{(£151973 / £325100)}$$

$$= £174447$$

or 53.7% of turnover

This can also be presented graphically.

PROFIT VOLUME GRAPH



The points are drawn (1) profit at turnover of £325100 to (2) fixed costs

The graph shows a BEP of approximately £175000 turnover.

The business therefore has a **margin of safety** of £325100 – £17444) = £150653 or 46.3% of turnover.