# Chapter 10
# MARGIN ANALYSIS: RISKS

*Costs are not like problems, people do not like them to be fixed*

In Chapter 9, we compared the respective growth rates of revenues and costs. In this chapter, we will compare all company revenue, charges, key profit indicators as a percentage of its business – i.e. sales in most cases – and production for companies that experience major swings in their inventories of finished goods and work in progress.

The purpose of this analysis is to avoid extrapolating into the future the rate of earnings growth recorded in the past. Just because profits grew by 30% p.a. for two years as a result of a number of factors, does not mean they will necessarily keep growing at the same pace going forward.

Earnings and sales may not grow at the same pace owing to the following factors:

- structural changes in production;
- the scissors effect (see Chapter 9);
- **simply a cyclical effect accentuated by the company's cost structure. This is what we will be examining in more detail in this chapter.**

## Section 10.1
## HOW OPERATING LEVERAGE WORKS

Operating leverage links variation in activity (measured by sales) with variations in result (either operating profit or net income). Operating leverage depends on the level and nature of the breakeven point.

### 1/ DEFINITION

**Breakeven is the level of activity for which total revenue cover total charges**. With business running at this level, earnings are thus zero.

Put another way:

- if the company does not reach breakeven (i.e. insufficient sales), the company posts losses;

- if sales are exactly equal to the breakeven point, profits are zero;
- if the company exceeds its breakeven point, it generates a profit.

A company's breakeven point depends on its cost structure.

## 2/ CALCULATING BREAKEVEN POINT

Before breakeven point can be calculated, it is vital for costs to be divided up into fixed and variable costs. This classification depends on the period under consideration. For instance, it is legitimate to say that:

- in the long term, all costs are variable, irrespective of their nature. If a company is unable to adjust its cost base, it is not a viable company;
- in the very short term (less than three months), almost all costs are fixed, with the exception of certain direct costs (i.e. certain raw materials);
- from a medium-term perspective, certain costs can be considered variable, e.g. indirect personnel cost, etc.

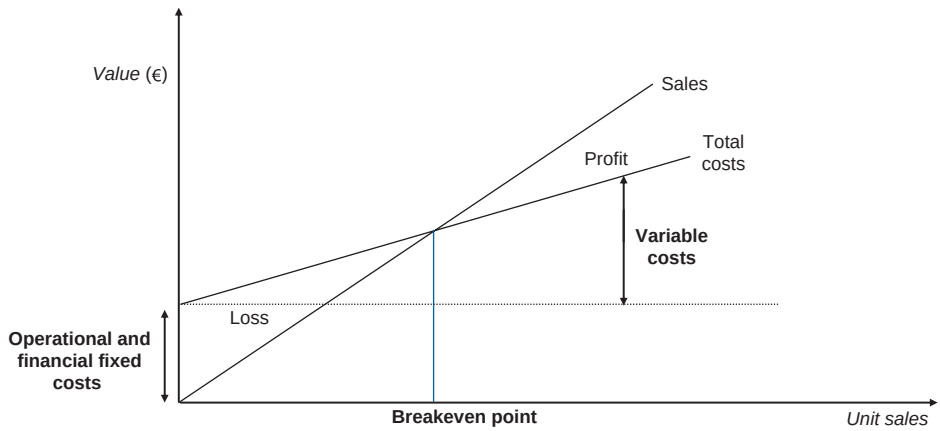
Breakeven point cannot be defined in absolute terms. It depends first and foremost on the length of the period under consideration. It usually decreases as the period in question increases.

Before starting to calculate a company's breakeven point, it is wise to define which type of breakeven point is needed. This obvious step is all too commonly forgotten.

For instance, we may want to assess:

- the projected change in the company's earnings in the event of a partial recession with or without a reduction in the company's output;
- the sensitivity of earnings to particularly strong business levels at the end of the year;
- the breakeven point implied by a strategic plan, particularly that resulting from the launch of a new business venture.

Breakeven point can be presented graphically:



Breakeven point is the level of sales at which fixed costs are equal to the contribution margin, which is defined as the difference between sales and variable costs. At the breakeven point, the following equation therefore holds true:

$$\begin{aligned} \text{Contribution margin} &= \text{Fixed costs} \\ \text{or } m \times \text{sales}_0 &= \text{Fixed costs} \\ \text{i.e. Sales}_0 &= \frac{\text{Fixed costs}}{m} \\ \text{with } m &= \frac{\text{Sales} - \text{Variables costs}}{\text{Sales}} \end{aligned}$$

where $\text{Sales}_0$ is the level of sales at the breakeven point and $m$ is the contribution margin expressed as a percentage of sales.

**Example** **A company has sales of €150m and fixed costs of €90m and variable costs of €50m.**

Its contribution margin is thus $150 - 50 = 100$, i.e. $100/150 = 66.67\%$ when expressed as a percentage of sales.

Breakeven point thus lies at: $90/0.6667 = €135\text{m}$. In this example, the company is 11.1% above its breakeven point.

At the beginning of 2003, McKinsey[1] estimated that the typical economics of an S&P 1500 company with a revenue of $100 was $19.2 fixed costs, $68.3 variable costs and an operating profit of $12.5. Accordingly, a decrease of 1% in turnover results in a decrease of 2.5% in operating profit.

1 *In: The power of pricing,* McKinsey Quarterly, *2003: **1**, p. 29.*

## 3/ THREE DIFFERENT BREAKEVEN POINTS

Breakeven point may be calculated before or after payments to the company's providers of funds. As a result, three different breakeven points may be calculated:

- **operating breakeven**, which is a function of the company's fixed and variable production costs that determine the stability of operating profit;
- **nancial breakeven**, which takes into account the interest costs incurred by the company that determine the stability of profit before tax and nonrecurring items.
- **total breakeven**, which takes into account all the returns required by the company's lenders **and** shareholders.

Operating breakeven is a dangerous concept because it disregards any return on capital invested in the company, while financial breakeven understates the actual breakeven point because it does not reflect any return on equity, which is the basis of all value creation.

Consequently, we recommend that readers calculate the breakeven point at which the company is able to generate not a zero net income but a positive net income high enough to provide shareholders with the return they required. To this end, we need to

adjust the company's cost base by the profit before tax expected by shareholders. Below this breakeven point, the company might generate a profit, but will not (totally) satisfy the profitability requirements of its shareholders.

Interest charges represent a fixed cost at a given level of sales (and thus capital requirement). A company that experiences significant volatility in its operating profit may thus compensate partially for this instability through modest financial expense, i.e. by pursuing a strategy of limited debt. In any event, earnings instability is greater for a highly indebted company owing to its financial expense which represents a fixed cost.

To illustrate these concepts in concrete terms, we have prepared the following table calculating the various breakeven points for Indesit:[2]

2 *We analyse the table for Indesit in Section 10.4 of this chapter (see p. 187). We have assumed that costs of sales and selling and marketing costs are all variable costs and that other operating costs are fixed. This is evidently a rough cut but nevertheless gives a reasonable estimate.*

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**BREAKEVEN POINTS (e.g. INDESIT)**

| € m | | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|
| Sales | | 3100 | 3064 | 3249 | 3438 |
| Operating fixed costs | $FC$ | 664 | 645 | 658 | 701 |
| Financial fixed costs | $FiC$ | 34 | 29 | 27 | 30 |
| Variable costs | $VC$ | 2237 | 2276 | 2404 | 2543 |
| Contribution margin as a % of sales | $m = \frac{\text{Sales} - VC}{\text{Sales}}$ | 28% | 26% | 26% | 26% |
| **Operating breakeven** | $\text{Sales}_{op} = \frac{FC}{m}$ | 2385 | 2505 | 2530 | 2694 |
| Position of the company relative to operating breakeven as a % | $\frac{\text{Sales}}{\text{Sales}_{op}} - 1$ | +30% | +22% | +28% | +28% |
| **Financial breakeven** | $\text{Sales}_{f} = \left(\frac{FC + FiC}{m}\right)$ | 2507 | 2619 | 2633 | 2810 |
| Position of the company relative to financial breakeven | $\frac{\text{Sales}}{\text{Sales}_{f}} - 1$ | +24% | +17% | +23% | +22% |
| **Total breakeven**(1) | $\text{Sales}_{t} = \frac{FC + FiC + PBT}{m}$ | 2752 | 2930 | 2959 | 3153 |
| Position of the company relative to total breakeven | $\frac{\text{Sales}}{\text{Sales}_{f}} - 1$ | +13% | +5% | +10% | +9% |

(1): *PBT*: profit before tax expected by shareholders, assumed to be €89m in this analysis for 2007 (with a cost of equity of 10% and a tax rate of 35%).

Based on these considerations, we see that the operating leverage depends on four key parameters:

- the three factors determining the stability of operating profit, i.e. the stability of sales, the structure of production costs and the company's position relative to its breakeven point;

- the level of interest expense, which is itself a function of the debt policy pursued by the company.

From our experience we have seen that, in practice, a company is in an unstable position when its sales are less than 10% above its financial breakeven point. Sales 20% above financial breakeven point reflect a relatively stable situation and sales over 20% above financial breakeven point for a given business structure indicate an exceptional and comfortable situation.

In the highly competitive and unstable conditions that we are currently experiencing, these figures may not be high enough in sectors with rapid technological changes.

## Section 10.2
## A MORE REFINED ANALYSIS PROVIDES GREATER INSIGHT

### 1/ ANALYSIS OF PAST SITUATIONS

Breakeven analysis (also known as cost–volume–profit analysis) may be used for three different purposes:

- to analyse earnings stability taking into account the characteristics of the market and the structure of production costs;
- to assess a company's real earnings power;
- to analyse the difference between forecasts and actual performance.

#### (a) Analysis of earnings stability

Here the level of the breakeven point in absolute terms matters much less than the company's position relative to its breakeven point.

The closer a company is to its breakeven point, the higher its earnings instability.

When a company is close to its breakeven point, a small change in sales triggers a steep change in its net income, so a strong rate of earnings growth may simply reflect a company's proximity to its breakeven point. This is the real problem affecting Japanese industry, the profitability of which is weak compared with that of industrial sectors in other countries.

Consider a company with the following manufacturing and sales characteristics:

| | | |
|---|---|---|
| Total fixed costs | = | €200,000 |
| Variable costs per unit | = | €50 |
| Unit selling price | = | €100 |

Its breakeven point stands at 4000 units. To make a profit, the company therefore has to sell at least 4000 units.

The following table shows a comparison of the relative increases (or reductions) in sales and earnings at five different sales volumes:

| | *Sales volumes* | *Net income* | | *Sensitivity* |
|---|---|---|---|---|
| Number of units sold | % increase compared to previous level (*A*) | Amount | % increase compared to previous level (*B*) | (*A*)/(*B*) |
| 4000 | | 0 | | |
| 5000 | 25% | 50,000 | Infinite | Infinite |
| 6000 | 20% | 100,000 | 100% | 5 |
| 7200 | 20% | 160,000 | 60% | 3 |
| 8640 | 20% | 232,000 | 45% | 2.25 |

This table clearly shows that the closer the breakeven point, the higher the sensitivity of a company's earnings to changes in sales volumes. This phenomenon holds true both above and below the breakeven point.

We should be wary when profits are increasing much faster than sales for a company with low margins since this phenomenon may be attributable to the operating leverage.

Consequently, breakeven analysis helps put into perspective a very strong rate of earnings growth during a good year. Rather than getting carried away with one good performance, analysts should attempt to assess the risks of subsequent downturns in reported profits.

For instance, Volvo and Peugeot posted similar sales trends, but completely different earnings trends during 2007 because their proximity to breakeven point was very different. Volvo was clearly farther from its breakeven point than Peugeot, as can be seen by comparing the 2006 operating margins: 8% versus 1%.

| | Sales | Operating income |
|---|---|---|
| Volvo | SEK285.4bn<br>+10% | SEK22.2<br>+9% |
| Peugeot | €60.6bn<br>+7% | €1.1bn<br>+260% |

Likewise, the sensitivity of a company's earnings to changes in sales depends to a great extent on its cost structure. The higher a company's fixed costs, the greater the volatility of its earnings as illustrated by the following example.

| | Sales | Operating income |
|---|---|---|
| Kesa | £6.10bn<br>(+10%) | £0.24bn<br>(+11%) |
| Nestlé | CHF 107.6bn<br>(+9%) | CHF 15.0bn<br>(+13%) |
| Lafarge | €17.6<br>(+4%) | €3.3bn<br>(+23%) |

Kesa, the UK electrical goods retailer, has the lowest fixed costs of the three and Lafarge the highest. An increase in Lafarge's turnover of 4% pushes up its earnings by 23%, whereas an increase in sales of more than twice that percentage (10%) only increases Kesa's operating income by 11%. Nestlé, the Swiss group whose fixed costs are in between those of Kesa and Lafarge, registers a lower growth in sales than Kesa but a higher growth in operating profit; growth in profit is nevertheless significantly lower than Lafarge (achieved with lower turnover growth).

### (b) Assessment of normal earnings power

The operating leverage, which accelerates the pace of growth or contraction in a company's earnings triggered by changes in its sales performance, means that the significance of income statement-based margin analysis should be kept in perspective.

The reason for this is that an exceptionally high level of profits may be attributable to exceptionally good conditions that will not last. In such conditions good performance does not necessarily indicate a high level of structural profitability. This held true for a large number of companies in 2006–2007.

Consequently, an assessment of a company's earnings power deriving from its structural profitability drivers needs to take into account the operating leverage and cyclical trends, i.e. are we currently in an expansion phase of the cycle?

### (c) Variance analysis

Breakeven analysis helps analysts account for differences between the budgeted and actual performance of a company over a given period.

The following table helps illustrate this:

| | *Value in absolute terms* | | | | *Structure* | |
|---|---|---|---|---|---|---|
| | Budget | Actual (*A*) | Change | % difference | Actual sales/Budgeted margin (*B*) | difference (*A*) – (*B*) |
| Sales | 240 | 180 | − 60 | −25% | 180 | – |
| Variable costs | 200 | 155 | − 45 | −22.5% | 150 | +5 |
| Contribution margin | 40 | 25 | − 15 | −37.5% | 30 | −5 |
| Margin | 16.66% | 13.9% | | | 16.66% | |
| Fixed costs | 20 | 25 | +5 | +25% | 20 | +5 |
| Earnings | 20 | 0 | −20 | −100% | 10 | −10 |

This table shows the collapse in the company's earnings of 20 is attributable to:

- the fall in sales (−25%);
- the surge in fixed costs (+25%);
- the surge in variable costs as a proportion of sales from 83.33% to 86.1%.

**The cost structure effect** accounts for 50% of the earnings decline (5 in higher fixed costs and 5 in higher variable costs), **with the impact of the sales contraction** accounting for the remaining 50% of the decline (10 lost in contribution margin).

## 2/ STRATEGIC ANALYSIS

### (a) Industrial strategy

A company's breakeven point is influenced by its industrial strategy.

A large number of companies operating in cyclical sectors made a mistake by raising their breakeven point through heavy investment. In fact, they should have been seeking to achieve the lowest possible operating leverage and, above all, the most flexible possible cost structure to curb the effects of major swings in business levels on their profitability.

For instance, integration has often turned out to be a costly mistake in the construction sector. Only companies that have maintained a lean cost structure through a strategy of outsourcing have been able to survive the successive cycles of boom and bust in the sector.

In highly capital-intensive sectors and those with high fixed costs (pulp, metal tubing, cement, etc.), it is in companies' interests to use equity financing. Such financing does not accentuate the impact of ups and downs in their sales on their bottom line through the leverage effect of debt, but in fact attenuates their impact on earnings.

A breakeven analysis provides a link between financial and industrial strategy.

When a company finds itself in a tight spot, its best financial strategy is to reduce its financial breakeven point by raising fresh equity rather than debt capital, since the latter actually increases its breakeven point, as we have seen.

If the outlook for its market points to strong sales growth in the long term, a company may decide to pick up the gauntlet and invest. In doing so, it raises its breakeven point, while retaining substantial room for manoeuvre. It may thus decide to take on additional debt.

As we shall see in Chapter 36, the only real difference in terms of cost between debt and equity financing can be analysed in terms of a company's breakeven point.

### (b) Restructuring

When a company falls below its breakeven point, it sinks into the red. It can return to the black only by increasing its sales, lowering its breakeven point or boosting its margins.

Increasing its sales is only a possibility if the company has real strategic clout in its marketplace. Otherwise, it is merely delaying the inevitable: sales will grow at the expense of the company's profitability, thereby creating an illusion of improvement for a while but inevitably precipitating cash problems.

Lowering the breakeven point entails restructuring industrial and commercial operations, e.g. modernisation, reductions in production capacity, cuts in overheads. The danger with this approach is that management may fall into the trap of believing that it is only reducing the company's breakeven point when actually it is shrinking its business. In many cases, **a vicious circle sets in, as the measures taken to lower breakeven trigger a major business contraction, compelling the company to lower its breakeven point further, thereby sparking another business contraction, etc.**

Boosting margins means improving management, enhancing the competitiveness of products, eliminating low- or zero-margin products, and consolidating operations around their existing strengths.

### (c) Analysis of cyclical risks

As we stated earlier, there is no such thing as an absolute breakeven point, but there are as many breakeven points as there are periods of analysis. But first and foremost, the breakeven point is a dynamic rather than static concept. If sales fall by 5%, the mathematical formulae will suggest that earnings may decline by 20%, 30% or more, depending on the exact circumstances. In fact, experience shows that earnings usually fall much further than breakeven analysis predicts.

A contraction in market volumes is often accompanied by a price war, leading to a decline in the contribution margin. In this situation, fixed costs may increase as customers are slower to pay; inventories build up leading to higher interest costs and higher operating provisions. All these factors may trigger a larger reduction in earnings than that implied by the mathematical formulae of breakeven analysis.

During cyclical downturns, contribution margins tend to decline, while fixed costs are often higher than expected.

Consequently, breakeven point increases while sales decline as many recent examples show. Any serious forecasting thus requires modelling based on a thorough analysis of the situation.

During the German property slump of the mid-1990s (after the reunification boom), a mere slowdown in growth halted the speculators in their tracks. Crippled by their interest expense, they were compelled to lower prices, which led to speculation of a fall in the market (purchases were delayed in expectation of an additional fall in prices).

Businesses such as telecoms and paper production, which require substantial production capacity that takes time to set up, periodically experience production gluts or shortages. As readers are aware, if supply is inflexible, a volume glut (or shortage) of just 5% may be sufficient to trigger far larger price reductions (or hikes) (i.e. 30%, 50% and sometimes even more).

Here again, an analysis of competition (its strength, patterns and financial structure) is a key factor when assessing the scale of a crisis.

## Section 10.3
## FROM ANALYSIS TO FORECASTING: THE CONCEPT OF NORMATIVE MARGIN

Nowadays, a great deal of the analysis of financial statements for past periods is carried out for the purpose of preparing financial projections. These forecasts are based on the company's past and the decisions taken by management. This section contains some advice about how best to go about this type of exercise.

All too often, it is not sufficient to merely set up a spreadsheet, click on the main income statement items determining EBITDA (or operating profit if depreciation and amortisation are also to be forecast) and then apply to all of these items

a fixed rate of growth. This may be reasonable in itself, but implies unreasonable assumptions when applied systematically. Growth is not a process that can continue endlessly!

Instead, readers should:

- gain a full understanding of the company and especially its key drivers and margins;
- build growth scenarios, as well as possible reactions by the competition, the environment, international economic conditions, etc.;
- draw up projections and analyse the coherence of the company's economic (for example, is its investment sufficient?) and strategic policy.

To this end, financial analysts have developed the concept of normalised earnings, i.e. a given company in a given sector should achieve an operating margin of x% (i.e. operating profit/sales).

This type of approach is entirely consistent with financial theory, which states that in each sector profitability should be commensurate with the sector's risks and that, sooner or later, these margins will be achieved, even though adjustments may take some considerable time (i.e. five years or even more, in any case much longer than they do in the financial markets).

What factors influence the size of these margins? This question can be answered only in qualitative terms and by performing an analysis of the strategic strengths and weaknesses of a company, which are all related to the concept of barriers to entry:

- the degree of maturity of the business;
- the strength of competition and quality of other market players;
- the importance of commercial factors, such as market share, brands, distribution networks, etc.
- the type of industrial process and incremental productivity gains, etc.

This approach is helpful because it takes into consideration the economic underpinnings of margins. Its drawback lies in the fact that analysts may be tempted to overlook the company's actual margin and concentrate more on its future, theoretical margins.

We cannot overemphasise the importance of explicitly stating and verifying the significance of all forecasts.

## Section 10.4
## Case study:[3] Indesit

3 *The breakeven table for Indesit is on p. 181.*

Most of the time the information provided by listed companies is not enough for an external analyst to be able to compute precisely the breakeven point.

A rough estimate may be made using linear regression of each cost against net sales to approximate the breakdown between fixed and variable costs. For Indesit, we have assumed that cost of sales were variable costs (which is probably a bit optimistic) whereas other operating costs were fixed (which seems a decent assumption looking at the evolution over the period).

Indesit remains significantly above its breakeven point for the whole period. It should be noted that in 2005, due to the decrease in margin, the group reduced its flexibility by getting closer to financial breakeven (the group was then only 17% above its breakeven compared to 24% the previous year). The situation is restored in 2006 and maintained in 2007.

What we assume to be the fixed costs are relatively stable over the period (+1.8% p.a., close to inflation). As we mentioned in Chapter 9 the variable costs increase due to increases in raw material prices but this increase is counterbalanced by increased production and sourcing from low cost countries. This last movement probably also increases the flexibility (i.e. the variability of costs).

## SUMMARY

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Breakeven point is the level of business activity, measured in terms of production, sales or the quantity of goods sold, at which total revenues cover total charges. At this level of sales, a company makes zero profit.

Breakeven point is not an absolute level – it depends on the length of period being considered because the distinction between fixed and variable costs can be justified only by a set of assumptions, and sooner or later, any fixed cost can be made variable.

Three different breakeven points may be calculated:

- operating breakeven, which is a function of the company's fixed and variable production costs. It determines the stability of operating activities, but may lead to financing costs being overlooked;
- financial breakeven, which takes into account the interest expense incurred by the company, but not its cost of equity;
- total breakeven, which takes into account both interest expense and the net profit required by shareholders. As a result, it takes into account all the returns required by all of the company's providers of funds.

Operating breakeven is calculated by dividing a company's fixed costs by its contribution margin ((sales – variable costs)/sales). Financial breakeven is calculated by adding interest expense to the fixed costs in the previous formula. Total breakeven is computed by adding the net income required to cover the cost of equity to fixed operating costs and interest costs.

The calculation and a static analysis of a company's breakeven point can be used to assess the stability of its earnings, its normal earnings power and the actual importance of the differences between budgeted and actual performance. The further away a company lies from its breakeven point, the more stable its earnings and the more significant its earnings trends are. The higher its fixed costs as a share of total costs, the higher the breakeven point and the greater the operating leverage and the volatility of its earnings are.

An analysis of trends in the operating leverage over time reveals a good deal about the company's industrial strategy. An attempt to harness economies of scale will raise the breakeven point and thus make a company more sensitive to economic trends. Efforts to make its industrial base more flexible will lower its breakeven point, but may also reduce its potential earnings power.

## QUESTIONS

@ *quiz*

1/ A company's net income, which was 0.2% of sales in year 1, leaps by 40% in year 2. State your views.

2/ Would it be better for an oil refinery to finance its needs using equity or debt?

3/ Would it be better for an Internet start-up company to finance its needs using equity or debt?

4/ You are appointed financial director of a cement group which has no debts. What should you be concerned about?

5/ You are appointed financial director of a cement group which has a fairly substantial amount of debts. What should you be concerned about?

6/ Is personnel cost a variable or a fixed cost?

7/ A major investment bank announces the best half-year results it has ever achieved. State your views.

## EXERCISES

1/ Below are the income statements of four companies with the same level of sales, but with different production costs and financial structures.

| | A | B | C | D |
|---|---|---|---|---|
| Sales | 100 | 100 | 100 | 100 |
| Variable costs | 65 | 55 | 36 | 30 |
| Fixed costs | 25 | 29 | 50 | 55 |
| EBITDA | 10 | 16 | 14 | 15 |
| Depreciation and amortisation | 2 | 8 | 4 | 6 |
| EBIT | 8 | 8 | 10 | 9 |
| Financial expense | 2 | 6 | 1.5 | 6 |
| Profit before tax and nonrecurring items | 6 | 2 | 8.5 | 3 |

For each company, calculate the breakeven point, before and after financial costs, and the company's position relative to its breakeven point.

2/ Below are the income statements for the Spanish Hoyos group. The company asks you to analyse these statements and answer the following questions:

(a) What is your opinion of the company?
(b) Is the company moving closer towards or further away from breakeven point?
(c) In your view, is the company in a period of heavy capital expenditures?
(d) What choices are made with regard to cost control?
(e) Explain the rise in financial expense.

| Grupo Hoyos | 1 | 2 | 3 |
|---|---|---|---|
| Sales | 82,000 | 92,000 | 97,000 |
| Change in finished goods and in-progress inventory | 500 | 1,400 | 2,800 |
| Production | 82,500 | 93,400 | 99,800 |
| Purchases of raw materials and goods for resale | 24,800 | 27,400 | 29,900 |
| Change in inventories | − 1,700 | − 500 | − 1,600 |
| Other external charges | 20,200 | 23,000 | 23,500 |
| Taxes | 1,200 | 1,400 | 1,500 |
| Personnel cost | 29,000 | 33,000 | 37,000 |
| Depreciation and amortisation | 5,200 | 4,900 | 4,800 |
| Provisions | 100 | 200 | – |
| Operating charges | 78,800 | 89,400 | 95,100 |
| Operating income | 3,700 | 4,000 | 4,700 |
| Interest, dividends and other financial income | 300 | 400 | 300 |
| Interest and other finance charges | 2,300 | 2,900 | 3,900 |
| Financial income | − 2,000 | − 2,500 | − 3,600 |
| Exceptional income | − 100 | − 100 | + 100 |
| Tax | 800 | 700 | 600 |
| Net income | 800 | 700 | 600 |

3/ In January of year 0, the Swiss group Schmidheiny published the following projected figures:

| | 0 | 1 | 2 | 3 |
|---|---|---|---|---|
| Production | 70.2 | 106 | 132 | 161 |
| Raw materials used | 29.4 | 35.4 | 44.3 | 53.8 |
| Personnel cost | 22.2 | 29.4 | 36.7 | 41.1 |
| Taxes | 0.5 | 0.7 | 0.7 | 0.8 |
| Other external services | 13.7 | 19.8 | 24.6 | 30.5 |
| Outsourcing | 2.5 | 8.9 | 11.2 | 11.3 |
| Depreciation and amortisation | 1.4 | 2.7 | 3.6 | 5 |

(a) Calculate the breakeven point for each year. The cost structure is as follows:
- variable costs: raw materials used, outsourcing, 50% of other external services;
- fixed costs: all other costs.

(b) Schmidheiny is planning a capital expenditure programme which should increase its production capacity threefold. This programme, which is spread over years 0 to 1, includes the construction of four factories and the launch of new products. The income statements for years 1, 2 and 3 factor in these investments. State your views.

(c) The company will need to raise around €30m to finance this capital expenditure programme. Financial expense before this capital expenditure programme amounts to €1.6m, and Schmidheiny is planning to finance its new requirements using debt exclusively (average cost of debt: 10% before tax). What is your view of the debt policy the company intends to pursue?

## ANSWERS

*Questions*

1/ *Low profit levels mean that any improvement in the economic situation will very quickly lead to higher profits (company close to breakeven point).*
2/ *A company with a very cyclical activity: financing with equity.*
3/ *Shareholders' equity.*
4/ *Turn a maximum of costs into variable costs, and bring down fixed costs.*
5/ *The same concerns as Question 4, and get rid of your debts!*
6/ *It depends on whether the staff are permanent or temporary and on the breakdown of salaries between fixed salary and commissions/bonuses and on whether local rules allow you to fire people rapidly (as in UK) or not (as in Germany or France).*
7/ *How much of this improvement can be attributed to an improvement in the economy, and how much to structural improvements?*

*Exercises*[4]

1/

| | A | B | C | D |
|---|---|---|---|---|
| Sales | 100 | 100 | 100 | 100 |
| Contribution | 35 | 45 | 64 | 70 |
| Contribution in % of sales | 35% | 45% | 64% | 7% |
| Breakeven point before financial expense[1] | 77 | 82 | 84 | 87 |
| Sales/breakeven | 129.6% | 121.6% | 118.5% | 114.8% |
| Breakeven point after financial expense | 83 | 96 | 87 | 96 |
| Sales/breakeven | 120.7% | 104.7% | 115.3% | 104.5% |

[1] *Total fixed costs = fixed operating costs + depreciation and amortisation*

2/ *(a) Personnel cost will increasingly eat into EBITDA. Given the steep rise in financial expense, profit before tax and nonrecurring items decreases in both absolute and relative value. The company is becoming less and less profitable, and accumulating more and more debts. One quarter of increased production is artificial, as it is tied up in inventories and finished products. The company is producing more but cannot shift its products.*
*(b) With stable margins on purchases and an increase in other costs, the company is clearly approaching its breakeven point.*
*(c) With depreciation and amortisation down in absolute value, we can conclude that the company is not overinvesting in fixed assets.*

4 *An Excel version of the solutions is available on the website.*

*(d) The management of Grupo Hoyos keeps tight control over raw materials, probably a reflection of a sound procurement policy. External charges are also well-managed. Personnel cost, however, is out of control.*

*(e) The company is not investing and the explanation for the increase in financial expense probably lies in the rise in working capital (increase in inventories).*

3/*(a) Economic breakeven point*

| **Schmidheiny** | **0** | **1** | **2** | **3** |
|---|---|---|---|---|
| Production | 70.2 | 106 | 132 | 161 |
| Variable costs | 38.75 | 54.2 | 67.8 | 80.35 |
| Contribution | 31.45 | 51.8 | 64.2 | 80.65 |
| Contribution as a % of sales | 44.80% | 48.87% | 48.64% | 50.09% |
| Fixed costs | 30.95 | 42.7 | 53.3 | 62.15 |
| Breakeven | 69.08 | 87.38 | 109.59 | 124.07 |

*(b) A good investment: improvement in earnings with fixed costs rising at a slower pace than production. The company is moving further away from its breakeven point. Trebling production capacity only results in a doubling of fixed costs. Improvement in production or over-optimistic projections?*

*(c) Breakeven point after financial expense with the envisaged level of debt.*

| | **1** | **2** | **3** |
|---|---|---|---|
| Breakeven point after financial expense | 96.8 | 119.0 | 133.3 |

*Debt capital significantly increases breakeven point and, accordingly, the risk.*

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