Mastering the *Volume – Cost – Profit* relationship

Chapter 4

'It's unwise to pay too much, but it's worse to pay too little.
When you pay too much, all you lose is a little money – that is all.
When you pay too little, you sometimes lose everything because the thing you bought
was incapable of doing the thing it was bought to do.
The common law of business balance prohibits paying a little
and getting a lot – it can't be done. If you deal with the lowest bidder,
it is as well to add something for the risk you run, and if you do that,
you will have enough to pay for something better.'

John Ruskin

Content

Overview		The importance of understanding the financial characteristics of the business.
The Contribution Approach	Q	Which products / services are financially attractive
	Q	Where is the salesforce most effective?
	Q	Which customers / groups are the most financially attractive?
Product and Service Pricing	Q	What is the effect of price reduction?
	Q	What is the effect of price increase?
	Q	How sensitive is profitability to volume / price changes?
Cost Profiling	Q	What is the spending on support activities?
	Q	How effective is this spending?
	Q	Where are the opportunities for improved effectiveness?

Overview

In this chapter we will consider some of the basic concepts of preparing and reviewing business financial plans. These will be the straightforward and practical 'ground rules'. Unfortunately many businesses fail to understand or apply these concepts.

Volume – Cost – Profit relationships

Directors and managers will usually focus on sales (volume and value) and profit performance. Future plans are often based on what has been achieved in the past with an emphasis on growth and, for larger businesses, increased market share. The impact on the business of a divergence from plan is not fully considered or even perhaps recognised.

The assumptions made in any plan will never be perfect and changes may occur in many areas. For example:

- Sales volumes
- Cost of materials and supplies
- Prices
- Labour costs
- Productive efficiency
- Interest rates
- Gross profit margin.

Directors and managers need to understand the **financial characteristics of the business** – how it will respond to change. To identify these financial characteristics we need to ensure that we have the right information to enable judgements to be made.

Unless the **Volume – Cost – Profit Relationships** are properly understood decisions regarding the future of the business may not produce the results expected. In the worst case they may place the future of the business at risk. Surprisingly many businessmen are unable to clearly and accurately describe the important financial dynamics of their business. For example, they have not thought through and evaluated key questions such as:

- Q Which products/services are the most attractive financially ? *or*
- Q What would be the effect of an increase/decrease in sales? *or*
- Q What would be the effect of a change in the mix of business? *or*
- Q What would be the impact of increased competition and pressure on selling prices?

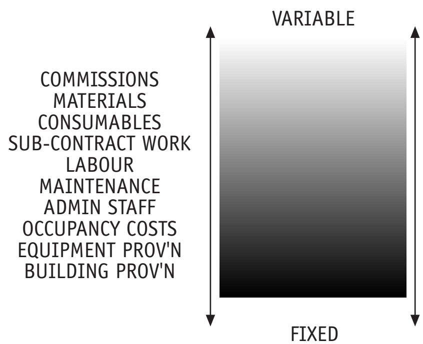
This chapter will introduce a series of basic principles, which are fundamental to decision taking. The subsequent chapter *Mastering option appraisal* will further develop these concepts in the context of strategy evaluation.

The contribution approach

This chapter started by stating that we need to understand the **financial characteristics of the business** – how it will respond to change. To develop this understanding we need to identify and separate:

Variable costs – expenses which vary in direct proportion to the volume of sales activity

Fixed costs – expenses which tend to remain constant, irrespective of the level of activity (naturally within limits).



Concept

Key Management Concept

This separation will enable us to identify the **CONTRIBUTION – the margin of sales value over the variable cost of the sales** i.e. the contribution which the activity, product or service makes to the fixed costs of the business.

A well-run business will recognise the need to make the distinction between cost types and reflect this approach in their management reporting and future planning. The following is a simple illustration of the way in which the information may be presented:

For example

	Product X	Product Y	Total
Sales	**4000**	**6000**	**10000**
Variable costs			
Materials	1200	1800	3000
Direct labour	1200	2400	3600
Total	2400	4200	6600
Contribution margin	**1600**	**1800**	**3400**
Contribution margin %	**40%**	**30%**	
Fixed costs			
Management & Admin			2000
Premises costs			800
Total			2800
Profit before interest			**600**

The advantages of this approach are that:

- **Variable costs are identified with the activity, product or service**
- **Fixed costs remain unallocated – therefore not distorting the figures**
- **Contribution margin is the key focus** – this emphasises the contribution to fixed costs made by each area of activity.

Application

The first step is naturally to establish the contribution margin performance of each area of the business. It is surprising how many even sophisticated businesses lack a real understanding of the profit (contribution) generated from their various activities, products and services. Without this data, decision taking becomes less logic based and relies on intuition, and luck!

Establishment of a database of contribution information enables three important aspects of performance analysis to be undertaken:

Product/service contribution

- Identifying the achievement of each area of the business portfolio.

Sales executive contribution

- Tracking contribution generated by each sales representative/sales manager provides a superior management mechanism in comparison to sales volume or value achievement.

Customer contribution

- Using the contribution database to evaluate the performance of each customer/segment based on the range of products or services consumed.

These three dimensions provide the foundation for performance review and business planning.

Product and service pricing

In this section we examine the likely financial impact of different pricing decisions. This emphasises the importance of understanding the effect of pricing on the Real Income (Contribution Margin) and therefore overall profitability of the business.

Concept

This approach illustrates the financial effects of different pricing strategies. We will use as an example a manufacturing company producing a small range of mechanical components for heating and ventilation equipment. These are primarily used in the construction industry. There is significant competition although the company has a good reputation. The management is considering two alternative pricing strategies to improve performance.

Reducing prices

Alternative one: REDUCE PRICES BY 10% – to attract increased sales volume

	Existing performance	**Price less 10%**
Sales	200,000	180,000
Variable costs	150,000	150,000
Contribution Margin (Real Income)	50,000	30,000
Contribution Margin %	25%	16.7%

This analysis helps to identify that…

… real Income per £1 of sales falls from £0.25p to £0.167p

… without additional volume the Contribution Margin (i.e. the contribution to the fixed costs or overheads of the business) falls by £20,000. If Fixed Costs remain unchanged bottom line Profit will also fall by £20,000

… to achieve the existing Contribution Margin of £50,000 sales of £300,000 must be achieved. (This is determined by calculating how many contributions of £0.167p in the £1 must be produced to generate £50,000 i.e. £50,000/0.167).

Sales volume must increase from £180,000 to £300,000 – a 67% rise just to stand still!

For most companies to achieve this level of increase would require considerable effort and probably the need to incur some additional costs. We will assume that our manufacturing business requires an advertising/promotional campaign (£5,000) and an additional member for the sales team (£10,000) – what will be the effect:

Additional fixed costs	£15,000
(and therefore Contribution Margin required)	
Contribution Margin %	16.7%
Therefore further Sales required to cover costs	£90,000

Sales volume must now increase from £180,000 to £390,000 – an incredible 117% rise

Increasing prices

Alternative two: INCREASE PRICES BY 10%

	Existing performance	**Price plus 10%**
Sales	200,000	220,000
Variable Costs	150,000	150,000
Contribution Margin (Real Income)	**50,000**	**70,000**
Contribution Margin %	25%	31.8%

With this alternative we can identify that…

… real Income per £1 of sales rises from £0.25p to £0.318p

… without loss of volume the Contribution Margin increases by £20,000

… to achieve the existing Contribution Margin of £50,000 sales of £157,233 must be achieved (i.e. £50,000/0.318)

Sales volume could fall from £200,000 to £157,233 – a fall of 28% before the company becomes worse off!

Working capital considerations

In examining both alternatives for our manufacturing company we have concentrated on the cost – volume – profit implications. However, this has ignored the potential impact on working capital. In practice it would be necessary to also consider the following financial effects:

	Prices less 10% effect may be	Prices plus 10% effect may be
Product Volume	– need to double	– fall by one quarter
Raw Materials Stock **Work–in–Progress** **Finished Goods Stock**	– average holding, and cash tied up, will rise	– average holding, and cash tied up, will fall
Debtors	– average outstanding and cash tied up, will rise	– average outstanding and cash tied up, will fall
Creditors	– average liability and finance used, will rise	– average liability and finance used, will fall

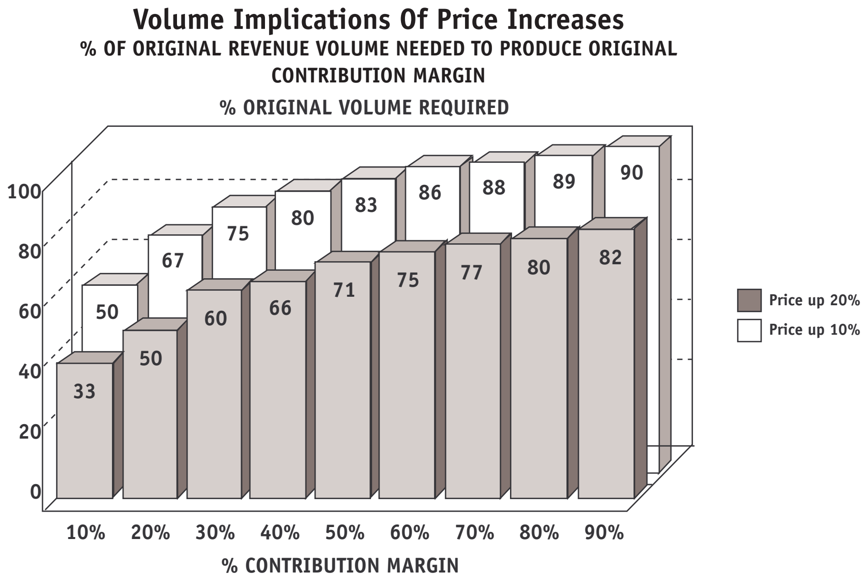
Here we are considering the potential additional cash tied–up (reducing prices) or cash released (increasing prices). These changes affect the cost of financing the business – the interest paid on borrowing – and therefore increases or decreases the overheads which need to be covered by the Contribution Margin.

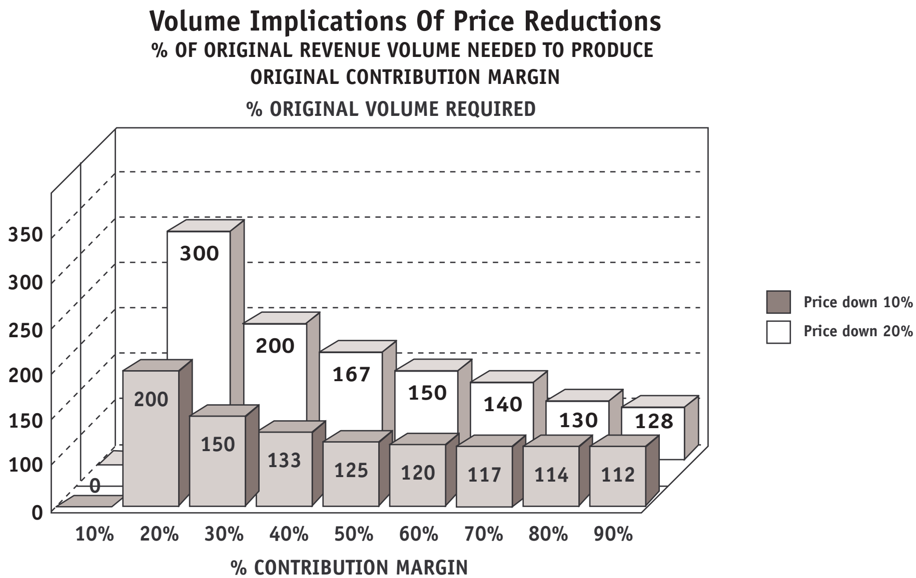
Application

Naturally for your own business you would be able to make more accurate assessments of these working capital changes. However, even this simplified approach provides clear evidence that **Profit and Cash effects cannot be considered in isolation from each other.** This additional, or reduced, cash requirement changes again the sales target for each alternative.

From these illustrations we can see how important it is for business directors and managers to understand properly **the financial characteristics of the business**. We have seen that this requires the identification of **Volume – Cost – Profit – <u>and</u> Cash relationships**.

The following two graphs illustrate the direct impact on volume of a 10% or 20% change in prices. The behaviour of this Volume – Price linkage is dependent on the level of the Contribution Margin for the particular business. Spend a short time studying these graphs to ensure that you understand the principles **– how do pricing changes affect your business?**





The traditional 'gut' reaction to pressure to improve performance is to endeavour to boost volume, often by reducing prices and increasing sales effort. In some businesses this policy has been pursued to the extent that the total contribution margin achievable, if 100% of capacity is used and sold, is insufficient to meet the fixed costs of the business. A hopeless situation! Actual case histories include:

- ***An engineering company where company fixed costs were greater than maximum production line throughput times product contribution margin***
- ***A printing business where company fixed costs were greater than maximum press capacity times average job contribution margin***
- ***A ferry shipping operator where vessel fixed costs were greater than total 'certificated' passenger capacity times average contribution margin.***

In some circumstances reducing prices will be a valid approach – in other conditions increasing prices will be the correct policy. In some it will be appropriate to hold prices. **Formal, but simple, evaluation of options using the Contribution Approach will identify the Threats, and the Opportunities.**

Cost profiling

The business planning and budget setting processes used in many businesses tend to produce incremental changes in performance, often particularly achieved by small adjustments to the level of costs incurred – improving financial **efficiency**. This Cost Profiling analytical technique seeks to identify potential opportunities for more radical changes to the business cost base. It focuses on improving financial **effectiveness** by examining the relationship between costs incurred and benefits to the business.

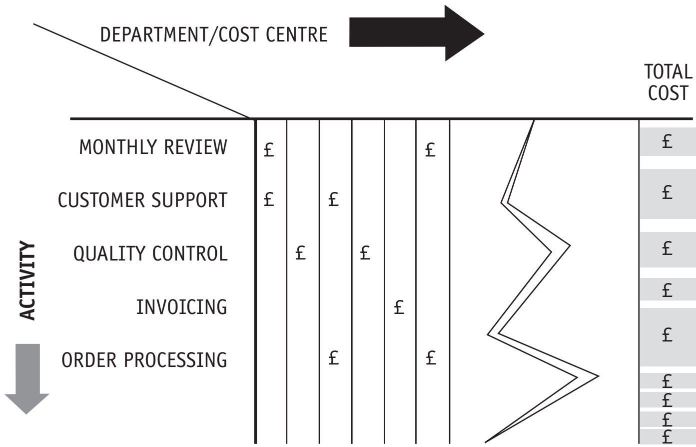
Concept

There are two key preparatory stages in the cost profiling process.

Activity cost assessment

The on–going 'activities' of the organisation are identified; for example customer enquiry handling, preparation of weekly management reports, production engineering etc. These activities may involve many departments/business units across the organisation, thereby incurring cost in each location. Using the budgets/management accounts data for each 'cost centre' (i.e. an organisation unit where costs are incurred) an analysis is prepared to identify the costs associated with each activity. Through this process the entire costs of the business are analysed by activity.

Cost Profiling – Activity Cost



Key Management Concept

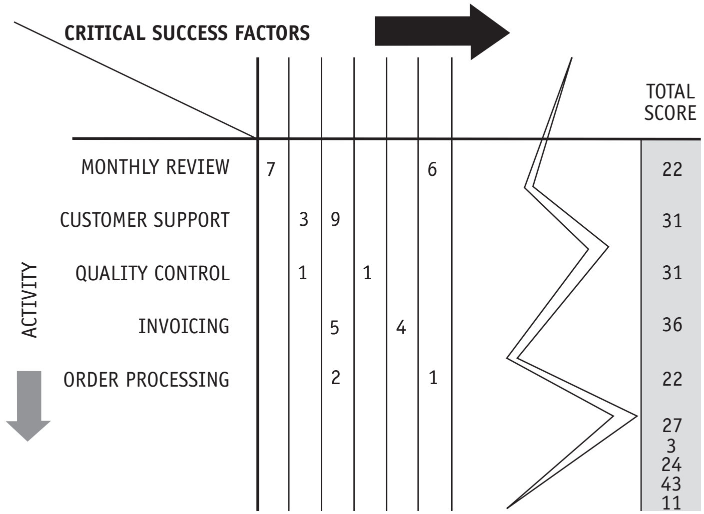
Activity benefit assessment

The focus here is to identify the 'value to the business' of the activity. The first step is to identify a set of criteria against which benefit can be judged. These criteria are the organisation's Critical Success Factors (CSFs) which derive from the strategic, market and organisational analysis discussed elsewhere in this book. Critical Success Factors are those things that the organisation needs to do well if it is to be successful.

The activities and the CSFs are entered into a second matrix. Each activity is then scored against each CSF to reflect its value to supporting that CSF. A simple scoring system may be used, say '0' … of no value, to '10' … fundamental to delivery of that CSF.

This ranking is normally undertaken by groups of senior executives and managers working in teams to agree the scores. The output from each group is then correlated to identify an overall response.

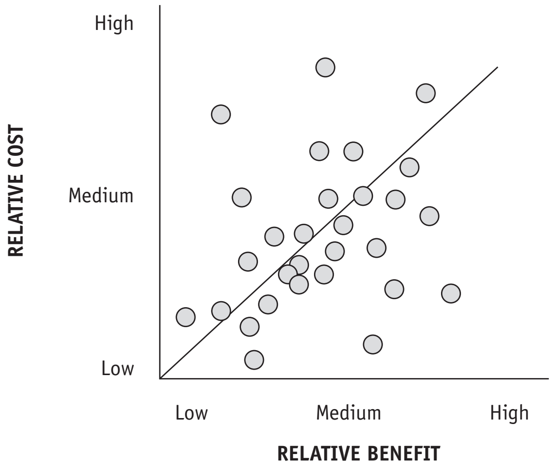
Cost Profiling – Activity Cost



Application

The two sets of rankings described in the previous paragraphs – Activity/Cost and Activity/Benefit – are then brought together in a Cost/Benefit matrix. An illustrative example of this matrix is shown on the following page.

Cost Profiling – cost/benefit map



Action Checklist

The objective of the Cost Profiling technique is to identify the Cost/Benefit attributes of each activity within the organisation. The Cost/Benefit 'map' highlights this relationship and draws particular attention to those activities which fall away from what is perhaps the 'expected' relationship indicated by the diagonal line.

Where an activity is 'low cost/high benefit' it is appropriate to evaluate the additional benefit that would occur if spending was increased.

When an activity is 'high cost/low benefit' it is appropriate to evaluate the opportunities and effect of reduced spending.

The **advantages** of the approach include:

- The identification of current effective spending and ineffective spending by requiring a complete review of resourcing and cost levels
- Recognition of the specific relationship between activity and cost
- That it is challenging and establishes financial and operational goals for performance improvement.

The potential **disadvantage** is that it can be time consuming to prepare the data with the required level of accuracy. However, as part of a strategic review it is an important technique for examining the cost effectiveness of spending within the organisation.