

Decision Making and the Limiting Factor

This third in the series of case studies focusing on Coverdrive Ltd involves the use of decision making techniques based on the limiting factor and the marginal cost model. Coverdrive Ltd is a SME producing cricket bats. It is generally accepted that businesses have one or more limiting factors or, as Professor John Sizer states “a factor in the activities of an undertaking which at a particular point in time or over a period will limit the volume of output”.

Within the planning stage of the budgetary cycle it will be apparent that there will be a factor or factors which will limit the organisational activities. This is often referred to as the key factor or principal budget factor, and its effects on the organisational plans must be fully assessed.

Such factors are often referred to as scarce resources which limit volume and may include:

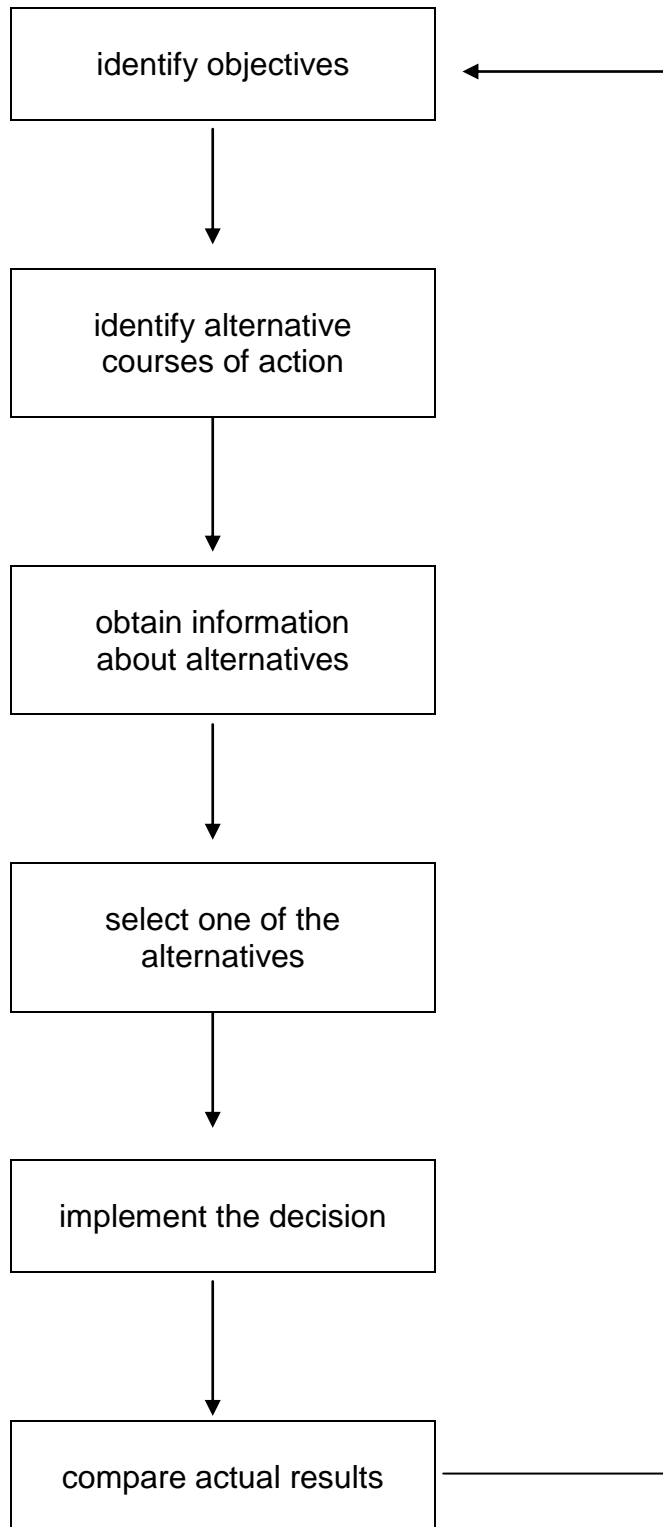
- supply of skilled labour
- supply of materials
- factory space
- finance – working capital availability
- plant capacity
- market demand

It is often the case that a business may face a single constraint situation, however, others may experience a multi-constraint scenario. Budgetary plans are usually set some months prior to the period to which they relate. Circumstances alter and situations often arise where limits are placed on a resource or series of resources after the plans have been formulated. Where resources can limit capacity, in the short run, a business must decide on the product mix which will secure maximum contribution (and therefore maximum profit).

This is the decision making process faced by the finance team in which the marginal cost model often features.

The Decision Making Cycle

The following diagram illustrates the decision making cycle:



The Use of the Marginal Cost Model in Decision Making

The function of the decision making process is the selection of a future course of action from a number of alternatives. It is recognised that some costs are common to every alternative and in the evaluation process they will have no direct bearing on the ranking of the alternatives. It is often the case in the decision making process that the fixed costs are disregarded as they are by definition insensitive to changes in volume of activity.

It is because of the nature of fixed costs and their behaviour that marginal costing techniques are applied.

The strategic objective of management is to select that course of action which will obtain from the resource base, the maximum amount of contribution, profit and thus return on investment.

Coverdrive Ltd have planned the following activity for March 2010:

Sales Budget (Units)

Products	"Special"	"Super"	"Classic"	Total
	1200	1150	1200	3550

Budgeted selling prices:

"Special"	"Super"	"Classic"
£70	£60	£55

Because of excess demand the previous month, the stocks of finished goods, normally held at approximately 14 days supply, had been sold.

Standard cost specification:

Direct Labour £6 per hour

Standard hours per unit:

"Special"	"Super"	"Classic"
4.0	3.5	3

Direct Material

Standard material usage per unit of output

"Special"	"Super"	"Classic"
1.4	1.3	1.2

Standard price per unit of material £10

Production Overheads

Variable £31000 (absorbed on basis of labour hours)
Fixed £15000

Other fixed overheads £20000

Early in the first week of the budget period March 2010, a machine in the primary preparation area, suffers a major breakdown and a replacement part from an overseas supplier and will not be available until the month end.

This will effect operating hours adversely by 10% in the budget period.

It will however not effect the employees' basic working week as the original plan for the month included some overtime working.

The capacity in direct labour hours required to produce the original plan was:

Products	"Special"	"Super"	"Classic"	Total
Standard hours per unit	4.0	3.5	3	
Production and sales	1200	1150	1200	
Standard direct labour hours	4800	4025	3600	12425

The limiting factor is direct labour hours and there will a shortfall of 1242.5 standard labour hours.

The business must therefore make a short-term decision, which will result in the most favourable course of action to minimise the effect of this shortfall in capacity.

The business needs to revise its budget and product mix, so that in the short run, it can secure maximum profit.

The decision making process involves the following steps:

- determine the contribution per unit of output/product
- determine the contribution per limiting factor – the labour hour
- rank the products per the contribution per limiting factor, to consider the alternatives
- revise the production and sales mix
- revise the budget

Firstly let us consider the original plan.

Coverdrive Ltd, Budgeted Operating Statement March 2010

	“Special”	“Super”	“Classic”	Total
Sales (Units)	1200	1150	1200	3550
	£	£	£	£
Revenue	84000	69000	66000	219000
Less:				
Direct Labour	28800	24150	21600	74550
Direct Materials	16800	14950	14400	46150
Variable Overheads	11976	10042	8982	31000
	<u>57576</u>	<u>49142</u>	<u>44982</u>	<u>151700</u>
Contribution	26424	19858	21018	67300
Fixed Costs				<u>35000</u>
Profit/(Loss)				<u><u>£32300</u></u>

Contribution per unit of output:

Products	“Special”	“Super”	“Classic”
	£ - p	£ - p	£ - p
Selling Price	<u>70.00</u>	<u>60.00</u>	<u>55.00</u>
Direct Labour	24.00	21.00	18.00
Direct Material	14.00	13.00	12.00
Variable Overhead	9.98	8.73	7.48
	<u>47.98</u>	<u>42.73</u>	<u>37.48</u>
Contribution per unit	<u>£22.02</u>	<u>£17.27</u>	<u>£17.52</u>
Limiting Factor			
Direct Labour hours/unit	4.0	3.5	3.0
Contribution per limiting factor	£5.51	£4.93	£5.84
Ranking	2	3	1

NB: The ranking per limiting factor differs from that on the contribution per unit of output.

Revision of Production and Sales Mix

Revised hours available

(12425 x 90%) 11182.50

Ranking "Classic"
production 1200 units
x 3 std hours

3600.00
7582.50

"Special"
production 1200 units
x 4 std hours

4800.00
2782.50

Hours remaining for production of "super"

Thus 2782.5 / 3.5 per unit

795 units of "super"

Revised Budgeted Operating Statement March 2010

Products	"Special"	"Super"	"Classic"	Total
Sales (Units)	1200	795	1200	3195
Contribution per unit of output	£22.02	£17.27	£17.52	
Contribution	<u>£ 26424</u>	<u>£ 13730</u>	<u>£ 21024</u>	<u>£ 61178</u>
Fixed Costs				35000
Revised Profit				<u><u>£26178</u></u>

A shortfall of profit of:

(£32300 - £26178) £6122

or (1150 – 795 units) *£17.27 (difference in rounding)

Conclusion

The revised production and sales mix is viewed only from a financial perspective. The business may decide to consider alternative strategies to avoid loss of customer satisfaction in not being able to meet the demand for “super”. They may in the short run be able to buy in a substitute or contract out the work. However they may decide to spread the shortfall across all products to minimise the adverse effect on the customer perspective.