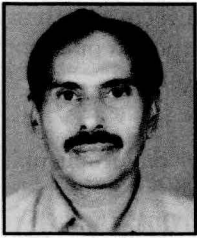


## Cost Accounting Models for Pricing



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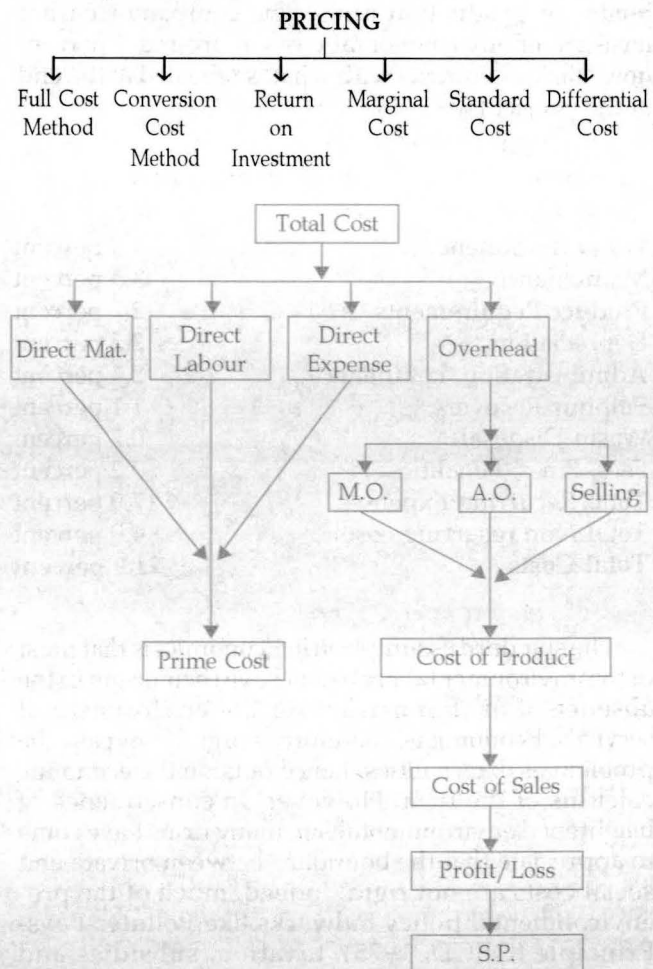
**P**rice has a variety of meanings according to the context. While buying a mobile anyone can ask "How much does it cost?" Here the word cost means the price. In the Oxford Dictionary the definition of the noun 'price' is the cost released or sacrificed of something in value. But in management technology, price of a product is not necessarily the same as cost.

There are many factors which affect the price of a product, which may be cost or non-cost factor. The former may be cost or non-cost factor. The former may be actual, imputed or replacement and the latter may include nature of industry, character of product, degree of competition, purchasing power of the customer, elasticity of demand and supply, management policies, inventory valuation, level of action, restrictions imposing by the government on price or imports or profession etc., availability of substitution, general economic condition and price agreement. Cost is the important factor which affects the price of a product in the long-run—this equates with cost plus profit to give a reasonable return on the capital employed. In the short-term, price is determined by the law of demand and supply. In the perfect competition management has a little say in price fixation, i.e. no concern can affect the price, although skill and knowledge of price fixing is desired in the imperfect competition.

The influence of cost in fixing prices has a great important aspect although it doesn't control or regulate prices in short-period. Product cost varies according to the cost accounting procedure and to the standards accepted, whereas price is the aggregate of number. of diverse elements which is arranged in different ways. For price fixation purpose, cost may be treated as guides and references points. It may they major role in cost plus contract in times of competition. Prices are related to cost many times due to Government interference and regulation/control of prices.

Differential price policies also require the use of cost. There are some cost models which play a very important role in price fixation.

The price models are :



### Full Cost Method

By adding fixed percentage mark up to the full cost of product (Variable Cost + allocated share of Fixed Cost). Fixed percentage profit varies from firm to firm depending upon the desired rate of return on capital employed. Although it is the logical way to maximize profits in the long run, it not only ignores the demand of the product but also ignores the pricing based on future cost.

### Conversion Cost Pricing

It doesn't include non-manufacturing costs. It makes serious attempts to take percentage of sales i.e. selling and administration cost to be percentage of sales.

For example :

XYZ Ltd. sells A & B at a selling price Rs. 11 per unit, Marginal Cost Rs 10 and mark up bench 10%, margin Re 1 from each product. Conversion cost will be :

	A	B
Material Cost	7	4
Marginal Cost	2	4
Fixed Cost	1	2
Production Cost	10	10
Mark up 10% on Production Cost	1	1
Sales Price	11	11

Conversion Cost is Rs 4 for A; Rs 6 for B.

Profit can be maximized if efforts are made to sell A more than B, although mark up is same, i.e. 10% of Rs 10 = Re 1.

### Contribution Approach

This approach recognizes that the variable cost of product of sales and trends excess of revenue over such variable cost is margin or contribution.

It is appraisable :

- Case of evaluation of proposals for change in selling price.
- Selecting most profitable business when capacity is limited.
- Idle plant capacity.
- Additional sales at reduced price.

Although it is complex to break down some items of overhead costs into fixed and variable parts, it is easier and can accurately predict the practical price decision.

### Price for Return OC

After full cost is determined the ROI of capital employed is used to work out mark up figure to reach selling price:

$$N.V.P = \frac{(TC + RF)/V}{1 - RW}$$

TC = Total Fixed Cost  
V = no. of units sold  
R = Rate of return ROI  
W = Variable Capital  
F = Fixed Capital on plant, building etc.

$$TC=500,000 \quad R=25\% \quad F= 40,000$$

$$W= 30\% , V = 400,000$$

$$\frac{(500,000 + 0.25*40,000)/400,000}{1 - 0.25*0.30} = 1.38$$

### Standard cost for pricing

It is a model by which actual is compared for establishing bids, contracts of selling price. Cost elements at a normal capacity are fixed at a standard cost and variance is analyzed by necessary efficiency/performance by various responsible centres.

The process of determining the prices on this is alone applicable for all the goods and services. Arm's length price should be valued on international transactions, i.e. a price which is applied between two unrelated persons and is transacted in uncontrollable situations.

To sum up, a good pricing system/model should foster a healthy competitive spirit among the uniform companies. By price mechanism/model the consumer, user of goods and services will be benefitted in national and international level. □

The Management Accountant – May, 2012 will be a special issue on

### 'ARMS LENGTH PRICING : ROLE OF CMA's'.

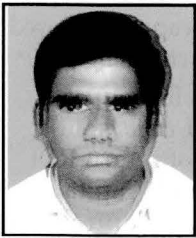
Articles, views and opinions on the topic are solicited from readers along with their passport size photographs to make it a special issue to read and preserve. Those interested may send in their write-ups by e-mail to [rnj.rajendra@icwai.org](mailto:rnj.rajendra@icwai.org), followed by hard copy to the Journal Department, 12, Sudder Street, Kolkata-700 016 to reach by 8<sup>th</sup> April, 2012.

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### 'FDI IN MULTI-BRAND RETAIL'.

Articles, views and opinions on the topic are solicited from readers along with their passport size photographs to make it a special issue to read and preserve. Those interested may send in their write-ups by e-mail to [rnj.rajendra@icwai.org](mailto:rnj.rajendra@icwai.org), followed by hard copy to the Journal Department, 12, Sudder Street, Kolkata-700 016 to reach by 8<sup>th</sup> May, 2012.

## Cost Accounting Models for Pricing



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The long-term Profitability of a company depends, inter alia, upon its ability to obtain prices for its range of products which will, after covering all costs, leave a margin of profit. This Margin should be, in the long run, adequate to :

- give a reasonable and fair return to the owners for the use of their fund and risks undertaken by them in investing the fund;
- provide, when economic conditions are not unfavorable, for the normal expansion of the business;
- satisfy employees in respect of conditions of employment and creditors with regard to credit-worthiness of the firm; and
- Attract new capital as and when necessary.

It goes without saying that pricing is only one factor that influence sales and, hence, profitability.

Most companies make a tremendous effort to assess their costs and prices. They know if the price is too high, the sale will be lost to a competitor. Too low, and the firms earnings targets won't be met. But, some companies fall into a rut, continuing to price their products the way they always have in the past, even if it doesn't make sense.

### The General Approach to pricing

In the short term, price will normally be determined by the interaction of supply and demand. As for example, if there is an increase in demand, price will tend to come down and vice versa. On the other hand, in the long run, price will tend to equal costs plus reasonable profits. In monopoly, price is generally fixed above the Marginal Cost (MC). In case of monopolistic competition (i.e. existence of many fillers of similar but not necessarily identical products, with no single seller having a large enough share of the market to permit his competitors to identify the effects of his/her pricing decisions) the margin to be added is determined with vulnerability of demand in the context of availability of substitutes of closely competitive type.

### Product costing is helpful in all circumstances

Cost Volume Profit (CVP) Analysis in product Pricing :

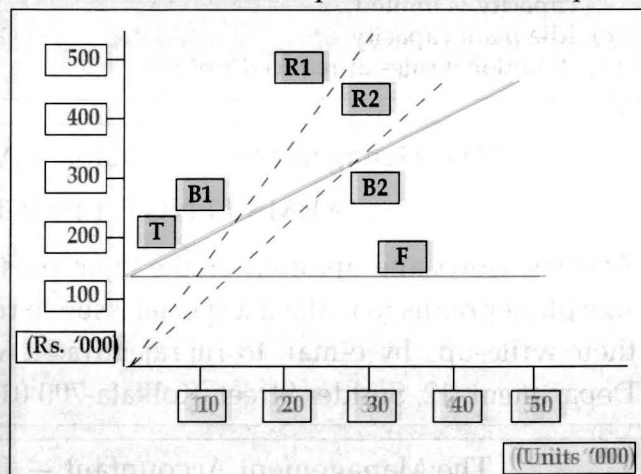
In microeconomic theory, optimum price refers to the price which yields the maximum profits (excess of Total Revenue over Total Costs).

The basic assumptions of pricing theory are

- The firm's main objective is to maximize its profits.
- The positions of demand and cost functions are duly considered
- The firm produces only one product.

The economic theory of price can be analyzed under two different assumptions using CVP analysis :

- Sale of unlimited quantities at an uniform selling price per unit
- Sale of additional quantities at reduced prices



### Break Even Analysis in Product Pricing

The following steps are required to prepare a break-even chart as illustrated above :

- Calculate fixed cost (Curve F)
- Calculate Variable cost per unit
- Add variable cost to the fixed costs for the range of units, which may be sold to produce the total cost (T).

- Product total revenue curves on the basis of a given price per unit sold. In the example, two curves R1 and R2 have been drawn R1 for a price of Rs. 5.00 and R2 for a price of Rs. 4.00
- The Break-even point is where the total revenue curve intersects with the total cost curve at B1 and B2. Sales above this point will be profitable; below this point a loss will be incurred.

### Models of pricing based on costs

#### Model 1 : Cost-Plus Pricing

Cost plus price mechanism under which a fixed percentage of profit is added to the cost means the full cost of current output and wage levels since these are regarded as most relevant in price determination.

This method of pricing is applied under the following conditions :

(a) It could be the only method possible when an enterprise is entering a new technological area, where the 'one-term cost' cannot be predicted accurately. The only rationale here is to cover the full cost of production plus a reasonable profit margin.

(b) Where the conditions has no choice but to accept the cost-plus price.

Government during World War II (1939-1945) extends into cost-plus contracts with suppliers for Government supplies. In certain cases, Government Departments like the Department of Supplies and Disposals entered into such cost-plus contracts for bulk purchases.

#### Cost Determination

For Cost Determination purposes, the following principles are adopted :

##### 1. Cost classification

- (a) Manufacturing, Administration and Selling & Distribution cost (or)
- (b) Variable cost & Fixed cost.

##### 2. Size of the unit and scale of operation

(a) Small manufacturers : An individual manufacturer may take his cost of production into account and arrive at a price at which the products are to be found in the concerned region.

(b) Medium and large manufactures: A manufacturer having several factories all over the country may determine the weighted average cost of the factories so as to arrive at a uniform ex-factory price for the country as a whole. If commodities are in short supply, high cost of individual units factories may have to be recognized during price determination. However, in the case of high cost producers, profit element may have to be reduced to encourage them to reduce their costs.

##### 3. Uniform costing for whole Industry

- (a) The selling price may be fixed after taking into

account the cost of representative unit from the industry, which may fall within the range of lowest cost unit and the highest cost unit.

(b) The factories in the industry may be classified into (i) Small size (ii) Medium size (iii) Large size.

(c) Representative samples are drawn and costs are determined by reference to the distribution pattern of the factories. For example, the costs of medium size factories can be taken into account if this group form the greater part of the industry.

#### 4. Determination of fixed costs

(a) Variable costs can be easily determined on a per unit basis. However, fixed costs per unit will have to be ascertained.

(b) Any assumption of low utilization may result in over-estimating the cost; conversely a high utilization assumption may result in under-estimating the cost.

(c) Fixed cost per unit should normally be based on the level of production and capacity utilization likely to be achieved i.e., normal capacity or capacity on sales expectancy.

#### 5. Depreciation

(a) If a firm wants to survive and stay in business, it has to maintain its fixed capital intact so that its fixed assets may be replaced at the end of their useful life working life out of the funds generated for profits retained in the business.

(b) In a period of relatively stable price levels, depreciation based on Historical cost of fixed assets would be adequate for achieving this objective.

(c) In periods when price level is continuously changing, the firm may not be left with adequate funds generated out of accumulated depreciation at the end of life of the plant to replace it at a higher price.

(d) Hence, depreciation should be properly included as part of cost so as to leave sufficient profits for Asset replacement.

Format for computation of product selling price under Cost Plus method :

Direct Material	xxx
Direct Labour	xxx
Direct Expenses	xxx
	——
Prime Cost	xxx
Add : Indirect Material	xxx
Indirect Labour	xxx
Indirect Expenses	xxx
	——

Manufacturing Cost	xxx
Admin. Cost	xxx
Selling Cost	xxx
	—
Total Cost	xxx
Add : Profit Margin	xxx
	—
Product Selling Price	xxx
	—

### Cost Plus pricing and Activity Based Costing (ABC)

In the decision so far it has been assumed that the 'cost' to be used in Cost Plus Pricing has been calculated using conventional absorption costing. Of course this need not be the case and the cost could be derived using Activity Based Costing (ABC) principles. It is claimed that conventional absorption costing tends to over-cost high volume products and under-cost low volume items. The effort of this is that, using Cost-Plus Pricing, the low volume items will have lower selling prices than they should have.

#### Advantages of Cost Plus Pricing Model

1. Guaranteed contribution.
2. Assured profit.
3. Reduces risk and uncertainties.
4. Most suitable in long run.
5. Considers market factors.
6. Full recovery of all costs.
7. Price stability.
8. Simplicity.

#### Disadvantages of Cost Plus Pricing Model

1. Ignores demand.
2. Ignores competition.
3. Arbitrary cost allocation.
4. Ignores opportunity cost.
5. Price-volume relationships.

#### Merits of Cost Plus Pricing Models

(a) The contractor is assured of a fixed percentage of profit. There is no risk of incurring any loss on the contract.

(b) It is useful particularly when the work to be done is not definitely fixed at the time of making the estimate.

(c) Contractor can ensure himself about the cost of the contract, as he is empowered to examine the books and documents of the contractor to ascertain the accuracy of the costs.

#### Model II : Variable Cost (or) Marginal Cost Pricing

Under this method, fixed costs are ignored and prices are determined on the basis of marginal cost.

A firm seeks to fix its prices so as to maximize its total contribution. Marginal cost is the change in total costs that results from production of additional unit of a product or service. Marginal costing is more effective than full cost pricing for the following reasons :

(a) Prevalence of multi-product, multi-process and multi-market concerns makes the absorption of fixed costs into product costs difficult.

(b) Constant development in science and technology makes the long run situation more uncertain and highly unpredictable. Long-run consists of series of short-run and we must aim at maximizing contribution in each short-run which will lead to profit maximization in the long run.

This method is generally adopted under following situations :

- When supply is in excess of demand
- pricing of new products
- Make or buy decisions
- Installed capacity is more than operating level of production
- Public utility of service
- When cut-throat competition is prevailing in the market
- Pricing of export products
- Pricing relating to special order.

#### Model III : Rate of Return pricing (or) Return on Capital Employed Pricing (ROCE)

This method is used when each division is treated as an Investment centre. Determination of ROCE is one of the most crucial aspects in price fixation and performance evaluation of investment centers.

The firm should determine an arrange mark upon cost, which is necessary to produce desired Rate of Return on its investment. The issues to be considered are :

- (a) Basis on which the capital employed is computed.
- (b) Components to be covered in the return on capital.
- (c) Fairness of the rate of return.

The Fairness of rate of return varies from industry to industry and from time to time and is primarily dependent on

- (a) the risks involved
- (b) the desirability of earning adequate profits to plough-back into business.

This method is commonly employed because it recognizes full cost of product plus reasonable return on investment.

For this purpose the following popular policies are followed :

- Maintain a Mark-up rate of profit over costs
- Maintain a Mark-up rate of profit over total sales
- Maintain a constant return on capital employed.

Return on investment pricing attempts to link the mark-up to the capital employed, and so set a price which includes a return on capital employed. Research has shown that many firms have pricing policies which reflect a target rate of return. The formula used is as follows :

$$\text{Selling price} = \frac{\text{Total costs} + (\text{Desired \% return on capital} \times \text{Capital employed})}{\text{Volume of output}}$$

Capital employed consists of net fixed assets employed for production and net working capital. Rate of return pricing is a refined variant of full cost pricing. In case of multi-product pricing the quantum of required profit may be apportioned on the basis of investment utilized in different products. The target return pricing model suffers from two theoretical objections :

- Capital employed includes trade debtors, but these cannot be forecast until selling prices are known. In practice, this will not normally have a significant effect on what is already an approximate calculation.
- Where demand is price-sensitive, it is not possible to forecast sales value unit-wise, and at the same time forecast prices.

#### Model IV : Added Value Method of Pricing or Conversion Cost Pricing

Unlike full cost pricing, Added value method of pricing (Conversion cost pricing) takes into account only the costs incurred by the firm in converting raw materials and semi-finished goods into finished goods. One of the limitations of full cost pricing is that where the firm is selling two products, which require different degrees of effort, to convert into a marketable state, no distinction is drawn between them.

#### Model V : Differential Cost Pricing

The differential cost is the additional cost incurred with the additional output or additional activity of the firm. When the firm is taking decision as to accept or reject a special order in addition to the normal activity then the price for the additional units will be the additional cost incurred for that order plus the desired profit from that special order. This differential cost pricing involves the comparison of the expected changes in costs and revenue relating to such special order.

#### Model VI : Standard Cost pricing

Standard cost pricing is based on the cost standard developed in management accounting systems. The

standard variable cost per unit is calculated by adding the total variable cost of production, namely cost of materials and direct labour, and the cost of bought-in components, and dividing this sum by the number of units produced. The steps taken to establish a standard cost price are :

- Calculate the standard variable cost per unit.
- Calculate the fixed cost per unit (the running expenses, including administration and selling expenses of the business over a period of time divided by the number of units to be sold in that period).
- Determine the profit required per unit during the same period.
- Add (a), (b), and (c) together to give the provisional selling price.
- Analyse the market prices for competitive products.
- Adjust provisional prices as necessary to take account of market price levels.

#### Model VII : Opportunity cost pricing

Opportunity cost is the revenue foregone by not making the best alternative use. Opportunity cost of good or service is measured in terms of revenue, which could have been earned by employing that good or service in some other alternative uses. In Managerial pricing decisions, quite often it becomes necessary to consider not the actual cost of a product but its opportunity cost. The following examples will clarify the meaning of the concept :

- If a firm receives an export order when its capacity is not fully utilized, the opportunity cost of using the plant for export production would be nil or zero since the unutilized capacity of the plant has no alternative use.
- The opportunity cost of yarn produced by a composite spinning and weaving mill and used in the weaving section would be the price that could have been used in the weaving section would be the price that could have been obtained by selling the yarn in the market. This opportunity cost is different from the actual cost of producing the yarn in the spinning section. To determine the profitability of the weaving section of a composite textile mill, we have to consider the opportunity cost of the yarn and not the actual cost thereof.

#### Model VIII : Experience Curve in Product Pricing

The concept of experience curves was first introduced by the "Boston Consulting Group" as a result of its studies of extremely fast growing sectors of the petro-chemical and electronics industries. These studies showed how the costs and, subsequently, the

prices of these products decline with experience in their production for three quite different reasons :

- Productivity gains resulting from repetitive standardized production. This is known as the learning effect.
- Technological improvements in manufacturing involving different production techniques and processes.
- Large-Scale manufacturing plants exhibiting economies of scale.

The benefit of study of experience curves is that they provide a formulized framework in which one can consider the likely future price response of a product as it penetrates a market, throughout the various stages of its life cycle.

#### Model IX : Target Costing for Target Pricing

Market based pricing starts with a target price. A target price is the estimated price for a product or service that potential customers will pay. This estimate is based on an understanding of customers' perceived value for a product or service, and how competitors will price competing products or services. Having this understanding of customers and competitors has become important for three reasons :

1. Competition from lower cost producers has meant that prices cannot be increased.
2. Products are on the market for shorter period of time, leaving less time and opportunity to recover from pricing mistakes, loss market share, and loss of profitability.
3. Customers have become more knowledgeable and demand quality products at reasonable prices.

Implementing Target pricing and Target Costing in brief

- Step 1 : Develop a product that satisfied the needs of potential customers.
- Step 2 : Choose a target price.
- Step 3 : Drive a target cost per unit by subtracting target operating income per unit from the target price.
- Step 4 : Perform Cost Analysis.
- Step 5 : Perform Value Engineering to achieve target cost.

#### Role of Cost and Management Accountants in pricing

The Management Accountant plays an important

role in formulation of pricing strategies and price fixation. Even then the pricing is the strategic issue of top management and marketing and sales management. The Management Accountant will also actively involve or associate in pricing decisions with them. The Management accountant will help the management by providing necessary cost and financial data for price fixation and will ascertain effect of changes in price on the profitability of the organization. His duty towards price fixation can be analyzed as :

- Ascertain marginal and total costs.
- Present reliable cost data and analyse it in evolving pricing policies and their implementation.
- On the basis of data furnished, Management Accountant has to verify from all angles and workout the actual as well as future cost of a product and estimate fair selling price, which will remain effective for the pricing period.
- Evaluation of various alternatives keeping in views the anticipated costs to make and sell the product and an anticipated profit.
- Presents the anticipated picture of the company so that all factors are considered by price fixation authorities while fixing fair selling price of the product.
- Assists in formulation of objectives, policies and procedures for fixation of product prices.
- Highlights all the relevant factors that will affect pricing decisions.
- Plays a vital role in cost control and cost reduction measures which will help in fixing competitive prices.
- Presents the management about the profitability of each product or service and overall profitability of the organization.
- Presents comparative picture of actual profits of each product or service with standard or budgeted profit.
- Assists in tender quotations.
- Ascertain the return on capital employed at various levels of activity and product lines.
- Analyses the inventories and their effect on product cost.

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