

Cost Allocation in a Service Industry

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This article evaluates a firm's service cost structure and the associated cost allocation methodology and its impact on pricing strategy, which manifests in revenues or market share, profitability, and customer satisfaction. We discuss a cost allocation methodology which will be useful in conjunction with other marketing tools in development of a pricing structure for a firm's services against the backdrop of dynamic market conditions and with the goal of maximizing shareholder value.

INTRODUCTION

Marketing success is the result of decisions that involve a complex combination of factors: pricing, product and service quality, product/service positioning, marketing efforts, promotion, marketer's reputation, and service delivery – all must be coordinated to ensure marketing success. Some of the key elements of a pricing strategy include an understanding of the firm's product or service cost structure as well as that of competitor's, estimates of demand and supply for the firm and its industry, pricing and income elasticity, nature of competition and industry environment, bargaining powers of both customers and suppliers.

In this article, we focus on the evaluation of a firm's cost structure and the associated cost allocation methodology in a service industry. We examine the impact of these factors on pricing strategy, which manifests in sales or revenues or market share, profitability, and customer satisfaction. Section II provides a literature review. Section III illustrates cost allocation issues in a service industry with an example. Section IV proposes a cost allocation methodology, evaluates pros and cons, and provides recommendations. Section V presents our conclusions.

LITERATURE REVIEW

GAAP require the use of absorption costing for external reporting purposes because most accountants view fixed overhead as an important component of the historical cost of inventory that is manufactured. Direct costing is not acceptable under GAAP. These and other aspects of cost allocation methodologies have been investigated by researchers as well as practitioners from diverse viewpoints in areas of accounting, finance, and economics. To facilitate our discussion, we group these studies into several convenient and appropriate categories: two basic pricing

models, full cost versus marginal cost, activity based costing, and finally reconciliation of variable and full cost debate.

Two Basic Pricing Models

Govindarajan and Anthony (1983) argue that most of the academic literature on pricing is derived from the “profit maximization” or “satisficing” model. The first model assumes that a firm attempts to maximize profits by setting prices such that marginal revenue equals marginal costs (which are essentially variable). Many economists, therefore, favor variable cost pricing, and do not support fixed costs, allocated costs, and full costs (which are the sum of variable and allocated costs). The second model assumes that the main objective of a business is to earn a satisfactory return and that revenue must recover all costs and earn a profit. This leads to “full cost” pricing as the standard practice. Of course, there are departures from “standard” situations.

Full Cost versus Marginal Cost

Cohen and Loeb (1990) point out that the allocation of fixed costs for use in pricing goods or services has generated the full cost versus marginal cost or absorption cost versus variable cost debate.¹

Why Marginal Cost?

Lucas (1997) summarizes that many studies conclude that absorption costs or non-volume related costs should not be allocated to the product unit level, and therefore, should not be used for decision-making; otherwise, the ensuing unit cost will be a function of production volume. Lucas suggests that such a cost is therefore only valid for one specific volume of output, but most planning decisions involve potential changes in volume.

Allen (2001) contends that the core of the marginal approach is to focus on contribution per unit of limiting factor. He argues that if production is limited by machine hours, priority should be given to the products which show the highest contribution per machine hour, leading to the maximization of contribution margin. He further observes that another trend has been to reduce the proportion of costs that are specific to products and change with volume, where more and more costs are shared across products and are insensitive to volume variations. He concludes that this practice has improved the attraction of the marginal approach, since it is the incremental contribution of an opportunity which is the crucial input to decision-making.

Why Full Cost?

Cohen and Loeb (1990) argue that the pervasive use of full costs in pricing may be partly reconciled with economists’ prescriptions for pricing so as to equate marginal revenue with marginal cost. Their study assumes that the additional capacity cost may be viewed as a type of congestion cost, and therefore, the rationale for allocating fixed costs in their study is similar to that provided by Banker et al. (1988), Devine (1950), Miller and Buckman (1987), and Zimmerman (1979).

Zimmerman (1979) argues that any opportunity costs and ensuing long-term incremental actual costs should be taken into account by individual managers when deploying labor resources. Such costs are difficult to observe and measure, but allocating current average cost can serve to proxy them. Zimmerman argues that the unit cost should include a proxy for the “concealed” costs of using labor that arise in the longer term. Finally, he argues allocating fixed costs for internal control.

Devine (1950) recommends that fixed costs be viewed as a surrogate for some unobservable opportunity costs that are not captured in variable costs alone. Govindarajan and Anthony (1983) find that more than 80% of the companies surveyed typically use full costs suggesting widespread use of the latter model. Their explanation for managers use of full cost pricing includes, first, the profit maximization model requires that managers search for all possible alternatives and select the one that maximizes profits. In the real world, do not have the option to act in this manner due to the lack of time, resources, or information, and therefore, they search for a satisfactory alternative, decide to accept it, and then go on to the next critical problem. Second, the economists' approach entails the application of the "law of supply and demand." While managers mostly can estimate the supply curve with acceptable accuracy; they cannot estimate the demand curve, and therefore, the law of supply and demand cannot be applied. Third, price is only one element in the marketing mix. The other factors are promotional strategy, channels of distribution, product quality, etc. Govindarajan and Anthony conclude that in the real world, most large companies use full costs, rather than variable costs, as a basis for arriving at standard prices.

Alternatives: Activity Based Costing

Kennedy (2000) suggests that the practice of using volume sensitive drivers to attach overhead costs to products may fulfill statutory and regulatory accounting requirements, but it is not suitable in today's competitive and dynamic business environment. He proposes that activity based costing is a generic term to describe an alternative paradigm to traditional volume-based cost models.

Reconciliation of Variable and Full Cost Debate

Lere's (1986) concludes that variable costing leads to the complete-analysis price for firms with linear cost curves if the demand and cost curves are deterministic; absorption costing leads to a price closer to the complete-analysis price for all levels of output if the cost curve increases at an increasing rate. Between the two is the normal-overhead absorption costing.

Baxter (2005) states that recently direct costing has found intellectual backing in the economists' teaching on marginal analysis, and he stresses that measure of an activity depends solely on items altered by the activity. He argues that direct cost estimates may be incomplete, because some outflows caused by jobs do not affect materials and labor but more general expenses; and they are in consequence treated as overhead. He maintains that despite such defects, direct costing uses clearer and simpler figures than alternatives that are made complex by the inclusion of overhead. Cost is treated as an "absorbed" part of overhead as well as the direct figure. This definition assumes important as overhead expenses were high compared to the direct costs. Baxter (2005) explains that over the years, absorption costing has become more and more complex. Managers clinch sales by charging less or more than budget prices (that reflect both budgeted direct and overhead costs). Presumably a "good" overhead rate attracts a satisfactory level of sales. He asserts that absorption cost may well work in practice but may lack the cause-and-effect relation to split the joint cost and hence may lack logic. Baxter (2005) concludes that direct costs may be a sound help with many problems, especially where overheads are relatively small. But some form of absorption cost is likely to be more useful, at least as a guide to pricing where overhead is high. Avionitis (2006) recommends a need for a "balanced" market-oriented and "situation-specific" approach when setting prices. Vercio (2008) points out that value of full absorption has been undermined, consequently, the use of full absorption for

decision making is discouraged. He argues that activity drivers that vary with volume should not be included in the cost per unit, but should be included in the fully absorbed profit and loss statement. Managers should not make strategic decisions using the fully absorbed unit cost.

He explains how to benefit from absorption costing. First, firms should develop a layered profit and loss statement where drivers or decisions levers are used to differentiate lien items, and are organized based on controllability of the customer and/or product. Second, he suggests a balance-sheet adjustment line for internal reporting and to ensure consistency with formal financial accounting reports.

COST ALLOCATION ISSUES IN A SERVICE INDUSTRY

A service business normally has no inventory, and therefore the income statement under both the methods will be the same, but the product unit costs will be different.² We now illustrate with an example the common cost allocation related issues faced by firms in a service industry. These issues are generally addressed as operating decisions, but many times the lack of real solutions leads to firms having to make strategic decisions about their survival. Table 1 shows the development of the labor rate of \$102 with actual rates varying about twenty percent (or \$80 to \$120) for a service location (field office) with a seventy percent utilization rate.³

Direct and indirect labor are treated as variable costs; the costs related to supervision are considered semi-fixed; and the full allocation of overhead (loadings) is treated as fixed costs. The labor rate includes basic wage components, allocated overhead costs, and utilization rate (the ratio of revenue generating hours to total man or paid hours). The fully allocated cost methodology uses all costs which include direct labor, indirect labor, and department, regional, and headquarters loadings divided by the expected total revenue-generating hours. The quoted rate to the customer includes an additional profit margin percentage. The labor should not be treated as a purely variable rate, but as shown in Table 1, may alternatively be viewed as a semi-fixed rate for some of the locations caught in a continual lowering of the utilization rate. Any reclassification of variable versus (semi) fixed cost can lead to different cost structure and pricing.

**TABLE 1
LABOR COSTS AND LABOR RATES**

	<u>Annual</u>	<u>Hourly</u>	<u>Current Treatment</u>	<u>Alternate View</u>
<u>Direct Labor</u>				
Calendar (Paid) Hours	2,080.00	1.00		
	\$	\$		
Salary	36,000.00	17.31	Variable	Semi-Fixed
Benefits @ 30%(pension, medical and other, taxes)	10,800.00	5.19	Variable	Semi-Fixed
Overtime (10% of the times the rate of 1.5 times)	<u>5,400.00</u>	<u>2.60</u>	Variable	

Subtotal	52,200.00	25.10		
Administrative Expenses (travel, meetings, supplies)	3,000.00	1.44	Variable	Semi-Fixed
Vehicle	<u>5,000.00</u>	<u>2.40</u>	Variable	Semi-Fixed
Subtotal Direct Labor	60,200.00	28.94	Variable	Semi-Fixed
<u>Indirect Labor</u>				
Other Administrative Expenses	300.00	0.14	Variable	Semi-Fixed
Call Scheduling and processing	<u>3,500.00</u>	<u>1.68</u>	Variable	Semi-Fixed
Subtotal	3,800.00	1.83		
Direct Supervision (includes all related allocated expenses)	14,000.00	6.73	Semi-Fixed	Fixed
Subtotal Indirect Labor	17,800.00	8.56		
Total Direct and Indirect	78,000.00	37.50		
Effective Labor Rate (assuming 70% utilization rate)	111,428.57	53.57		
<u>Additional Allocation of Overhead (@ 70% utilization rate)</u>				
Department Level Allocation (assume 10%)	11,142.86	5.36	Fixed	Fixed
Regional Level Allocation	<u>60,000.00</u>	<u>28.85</u>	Fixed	Fixed
Subtotal Regional	182,571.43	87.77		
Corporate Headquarters' Loadings	30,000.00	14.42	Fixed	Fixed
Total Company	\$212,571.43	\$102.20		

DISCUSSIONS AND RECOMMENDATIONS

We further expand upon the cost allocation issues and to make specific observations and recommendations. While some of the costs (e.g., direct labor) can be directly associated with a specific service call, allocating other costs (indirect labor and overhead) using the current hourly rate method requires many approximations or assumptions. In many cases, the approximations or assumptions may be arbitrary. For example, indirect labor may be assumed to be a certain percentage of direct labor depending upon the level of activity in the service, and an overhead cost is estimated to be certain percentage of the sum of a number of variable costs, many of which are also estimated. It is erroneous to assume that productivity is constant when the hourly rate is used in cost-volume projections, breakeven analyses for different locations or service calls, pro-forma cash flow projections.

The hourly rate method expenses indirect costs and fixed overhead costs in a two-step process. In the first step, the costs are allocated to a specific service call through various estimates and assumptions. In the second step, the costs are assigned to the service call in proportion to the total service call time.

At first, the hourly rate method appears to be correct because it includes all costs; however, it has some weaknesses when we try to compare different volumes or types of service calls. The

first assumption is that all costs can be expensed as variable costs, which may not be true. The merits of simplicity in accounting calculations can mislead the management team and lead to wrong decisions. If a field office has technicians available with no service calls during its normal working hours in a day, the breakeven price based on the hourly rate method for a new service call will equal to the variable cost plus some allocated portion of the fixed or overhead costs. In truth, the breakeven price in this case would be equal to the variable cost only as the fixed cost would be the same irrespective of the supervisor's decision to send the technician to service the new call. Also, that field office's operating income would be unaffected if management decided to price the incremental service calls to recover only the variable costs.

The second drawback stems from the arbitrary assumption that the hourly rate method allocates company-wide costs to individual locations. In our example, these allocations make up 23% of the labor rate and 60% of the hourly rate. Although such a cost allocation methodology may be satisfactory for cost-based pricing of a particular service call, it can introduce errors in the comparison of different types of competing service calls. In such cases, it is difficult to ensure that indirect costs are treated consistently among the alternatives. Furthermore, in projections of cash flow, the fixed cost allocation approximations and algorithms generally do not work. The hourly-rate deploys time-based cost absorption where the fixed costs are allocated on the basis of time that a service call requires in a particular location. But, different service calls absorb costs at different rates. A service call that takes one hour to complete the job may not require less indirect costs and overhead than a service call that takes three hours to complete. However, the hourly rate method underestimates these costs to be only one third for the one-hour service call. The assumptions or approximations deployed in an hourly rate method become ineffectual and do not work in the short run.

The hourly rate method assumes that productivity is fixed or constant at some average rate. This assumption does not work in the short run. Each cost element is associated with a function and each function involves transaction. The cost associated with each transaction is low-balled in the short run as costs are assigned based on the time associated with a service call.

The time to service a call also depends on each technician. The hourly rate method assigns the same rate to a rookie technician and a well-trained, experienced technician. The fixed cost may be the same for both, but the time to service a call may vary. But, the hourly rate method will assign the higher fixed cost if the time to service a call by a rookie technician is higher. In a short run, the non-productive parts of a service call are the largest share of the component cost.

The contribution margin approach helps to assess the impact of changes in volume on cash flow. The weakness of the contribution approach is that it may not encompass all relevant costs. To solve this drawback, in addition to including the variable cost one may want to include relevant indirect costs but exclude unrelated indirect and fixed costs that the hourly rate method includes in its computations. Therefore, the allocated fixed cost at the location may be included together with the variable cost but not the entire company-wide overhead cost as in the current hourly rate method.⁴ There is no need for an arbitrary allocation algorithm, since costs are not allocated across different field offices at different levels such as department, region, and nationwide. One can further understand absorption costing by breaking it down into several relatively simple steps.⁵

The allocation takes place in a single step and not in two steps as in the current hourly rate method. This suggested direct-cost method does not assume the productivity at a location is constant at some assumed desired or required level. The current hourly rate method continues to be used because of lack of awareness of the drawbacks in the current hourly rate method. Firms

tend to follow trade and industry associations and prevailing reporting standards. The hourly rate method is used erroneously as a marketing (pricing) tool. The sales people are not accountant, and they lack the operating experience. Therefore, they may overlook the shortcomings of the hourly rate method.

APPLIED CONCLUSIONS

Our discussion points out many drawbacks and areas for improvements in cost allocation methodologies. We note that allocation of overhead costs with approximations, assumptions of constant productivity, and allocation of same time and overhead costs to dissimilar tasks or a service calls may generate a bloated cost structure for some product or business units. We recommend a market oriented pricing for a product or service, and development of a cost structure which involves inclusion of relevant indirect costs with variable costs. Finally, our example shows that organization structure plays a key role in development of a cost structure for a product or service. Organization structure should be such that less overhead is used. One of the objectives of management accounting is to influence behavior rather than to provide accurate product and service costs. The charge to the user may be viewed as an internal transfer price and serves as an effective method for ensuring prudent use of the service.

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ENDNOTES

¹ The allocation of fixed costs for use in pricing goods or services has also for years generated the direct versus indirect cost debate. Indirect costs are defined as costs that are incurred for the benefit of two or more components of a company in such a way that it is difficult or impossible to trace specific portions of the costs exclusively to individual components. Indirect costs are considered to be synonymous with common costs. Direct costs are seen as simpler and consistent with economists' teaching on marginal analysis. However, for practical reasons, direct costs may be incomplete and, even if complete, may "lure him into an unfortunate low quotation." Absorption costing was "more helpful" in providing a guide to prices that covered overhead. However, absorption costs will always be, to some extent, arbitrary because of the treatment of joint costs. A critic will hold that "absorption cost can be defended only on the grounds that it works well in practice; it is sadly at odds with principle". For a further discussion on direct costing see Goldratt (1990) and Baxter (2005), and for issues related to indirect costing, see Dugdale and Jones (2005), Kaplan (1987), and Rosson (2004).

² For a further discussion, we recommend Williams, Stanga, and Holder (1992). The cost allocation issues in manufacturing and service industries are discussed by Horngren and Foster (1991), Biddle and Steinberg (1994), Weygandt, Kieso, and Kimmel (2004), Williams, Stanga, and Holder (1992).

³ We thank IABE for permission to reproduce the table, which was originally published by Deo and Penkar (2008).

⁴ A study sponsored by the National Association of Accountants found that most companies do allocate their indirect costs into distinct groups: corporate administrative costs and corporate service costs. A much stronger case can be made for allocating the service costs than can be made for allocating the administrative costs.

⁵ For the most part, firms say that they allocate their indirect costs on a benefits-received basis or on a causal-factor basis, whereas in fact indirect costs are allocated on an ability-to-bear basis (see Fremgen and Shu (1981).