The Hourly Rate: Myth And Reality

by Yoram Eden and Boaz Ronen

Many managers in industry use the hourly rate accounting measure as a decision-making tool. The hourly rate is composed of cost of wages and salaries plus indirect costs divided by number of direct working hours. We may define the firm's hourly rate or the hourly rate for a given department. We may also characterize the hourly rate according to the type of employee and define an hourly rate for a programmer, an engineer, a technician or a production worker.

The widespread use of the hourly rate measure arose from the cost-accounting practice of allocating indirect costs on the basis of direct working hours. For cost-accounting purposes, a working hour is composed of direct and indirect costs .

Users of the hourly rate measure are firm in their belief that it is a simple and practical decision-making tool, well-suited to the entries commonly used in cost-accounting. It does indeed have several advantages which make it useful under certain circumstances:

- It constitutes a message to management that, if it is to maintain profitability of the firm in the long term, the firm must not take on a job if the fee for it is lower than the firm or department hourly rate.
- In make-or-buy decision problems it is worthwhile for the firm to contract out jobs if the outside opportunity cost of working with the subcontractor is lower than the firm's hourly rate.
- For job-ranking purposes, if the firm cannot carry out all the orders it receives (because of capacity constraints), it should choose those jobs that promise the highest profits per working hour.

The purpose of this article is twofold:

- To demonstrate that the widespread use of the hourly rate measure has no economic base and that in the long term it will lead to the unjustified rejection of worthwhile orders, and to unjustified contracting out to subcontractors.
- To propose alternative performance measures that will lead to more accurate decision making.

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Distortionsof the hourly rate measure

Examination of the use of the hourly rate measure reveals three inherent assumptions:

1. The firm or the department are in a state of full employment or will be so placed in the future. Rejection of some of the jobs offered or contracting out is therefore unavoidable.
2. The indirect costs all vary in proportion to the direct working hours.
3. The various work stations of the firm are completely interchangeable.

Theoretically, it can easily be shown that if these three assumptions are wholly or partially unfounded, then the hourly rate measure becomes meaningless.

To demonstrate the distortions caused by the use of the hourly rate measure we shall make use of the following simple numerical example.

A certain firm is planning 10,000 direct working hours for the next quarter. The cost of each direct working hour (DWH) is $50. Moreover, indirect fixed costs of $750,000 are planned for the quarter.

The planned hourly rate is demonstrated by the following:
750, 000 + 10, 000 x 50÷10,000 = $125

The firm receives offers of four different jobs, all of which must be completed within the next quarter. A subcontractor is willing to undertake only one of the jobs (Job No. 103). Table 1 details the four orders.

In our example the firm cannot undertake to carry out all of the four orders it has received, since to do so would require a capacity of 13,000 DWH and it has a capacity of 10,000 DWH only.

Straightforward application of the hourly rate measure will lead to the following decision: To accept Job Nos. 101 and 102, to contract out Job No. 103 to a subcontractor, and to reject Job No. 104. Apparently, it would be worthwhile to contract out Job No. 103, since the subcontractor's hourly rate is lower than the firm's hourly rate. For similar reasons it would be apparently worthwhile to reject Job No. 104, since its hourly rate is lower than the firm's hourly rate. This decision is typical of a firm that is part of a large concern in which the performance of middle management is measured on a project basis. In such a case it is possible to report a profit for each project, even though, as we shall see later, the decision is a wrong one and leads to a loss for the firm .

Implementation of this decision means non-exploitation of a production capacity of 3,000 DWH. Sometimes these 3,000 hours are left unexploited while management is seeking ways of reducing the excess capacity. The reader will then no doubt immediately discern that if there is no other, more profitable, means of exploitation for the 3,000 hours, it is worthwhile accepting Job No. 104, since it yields a positive return. A better decision would apparently be to carry out Job Nos. 101, 102 and 104, and to contract out Job No. 103.

However, it can be easily demonstrated that the optimal decision will be to carry out Job Nos. 101, 102 and 103 — that is, not to contract out Job No. 103 — and to reject Job No. 104.

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An analysis of the profit to be realized from each of the above-mentioned methods is presented in Table 2.

This example illustrates an important point. The fact that the firm's hourly rate is higher than the outside opportunity cost of contracting out does not necessarily mean that the job should be given to a subcontractor, even when the firm is in a state of full employment. The decision should be made on the basis of the return to be derived from the various alternatives and not on a comparison of the hourly rates of the firm and the subcontractor.

Our simple example assumes that the direct labor is homogeneous and constitutes the sole manufacturing constraint facing the firm. It is clear therefore that the determining factor must be the contribution to the DWH (the contribution to the unit of constraint).

The contribution to a DWH in manufacturing Job No. 103 is 120 - 50 = $70.

The contribution to a DWH in manufacturing Job No. 104 is 90 - 50 = $40. An extra $20 must be added to this contribution on account of agent's fees for contracting out Job No. 103, so that the total contribution from choosing to manufacture Job No. 104 will be $60. Preference should be given to the job that promises a higher contribution to the unit of constraint, that is, to Job No. 103.[1]

It should be noted that the hourly rate is an average. The true meaning of this measure is that the firm will make a profit if it sells all of its hours at an average price that is higher than the hourly rate. This does not mean that every order needs to be sold at a price that is higher than the cost of an hour.

The firm's management must consider each incoming order on its own merits, taking into account its manufacturing constraints. If the firm is in a state of full employment (i.e., there is an internal-resource constraint) or will be so in the foreseeable future, the incoming orders should be evaluated on the basis of their contribution to the unit of constraint. On the other hand, if the firm is or is forecasted to be in a state of under-employment, the best opportunity should be chosen and entered into production, irrespective of the hourly cost, and in accordance with its contribution only. Contribution in this sense is the selling price minus the cost of raw material.

Analysis of indirect costs

In the modern manufacturing environment, indirect costs carry a high weight in comparison with direct costs. The traditional accounting practice of distributing indirect costs on the basis of direct working hours is no longer suitable to the modern manufacturing environment. In particular, it is incorrect to assume that all direct working hours take up the same inputs of indirect costs. In any case, it is clear that the use of the hourly rate as a decision-making tool is fundamentally incorrect.

In our example we assumed that indirect costs are fixed. This is the accepted practice in many industrial enterprises. However, experience shows that classifying indirect costs, according to volume of production (number of working hours), as fixed and variable, ignores an important feature of indirect costs. In the long term, there is a connection between the volume of indirect costs and the degree of complexity of the product. Thus in the high-tech industry the costs of product planning, preparation of specifications and quality control carry a critical weight.[2] Moreover, the manufacture of complex products in small batches leads to a significant increase in indirect costs. Traditional cost-accounting practices allocate indirect costs according to volume of production, and not according to complexity of production. Only too often this leads to undercosting in the manufacture of complex products and overcosting in the manufacture of more standard products.

Thus in planning its job portfolio and product mix for the long term, the firm must give serious consideration to the implications of the product mix on indirect costs. Management must be aware that unnecessary broadening of the range of products and unfocused production may lead, in the long term, to a significant increase in indirect costs. This is the underlying principle of activity-based costing (ABC), a concept covered by Kaplan.[3] This approach postulates that complex and one-time jobs give rise to a significant increase in indirect costs and that they must be costed accordingly. Determining cost according to the hourly rate is misleading, since it results in undercosting of jobs that are complex and one-time in nature.

Job No.	DWH to be performed	Total Income ($)	Income/DWH ($)	Sub-contracting Cost ($)	Sub-contractor hourly rate ($)
101	4,000	600,000	150	-	-
102	3,000	405,000	135	-	-
103	3,000	405,000	120	300,000	100
104	3,000	270,000	90	-	-

Table 1

The Decision	Total Income ($)	Labor Costs and Cost of Subcontractor ($)	Income ($)	Indirect Fixed Costs ($)	Profit (Loss) $
Manufacture 101, 102, contract out	1.365 million	650,000	715,000	750,000	(35,000)
Manufacture 101, 102, 104 contract out 103	1.635 million	800,000	835,000	750,000	85,000
Manufacture 101, 102, 103	1.365 million	500,000	865,000	750,000	115,000

Table 2

Summary and suggested solutions

Figure 1 presents a schematic description of the alternative solutions. The nature of the solution depends upon both the manufacturing constraints and the manager's decision and planning horizon. Three different solutions may be offered that are

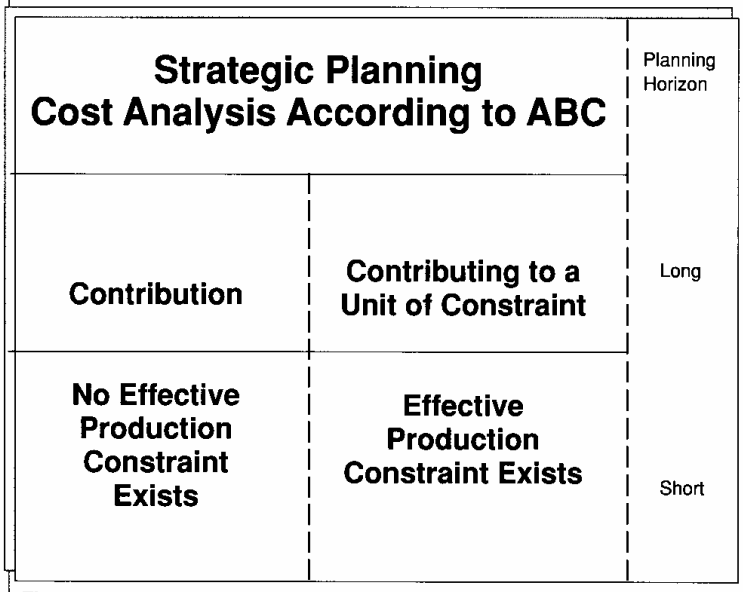

Figure 1

ferent solutions may be offered that are suitable for three different situations.

1. The Contribution Per Unit of Constraint (under excess demand, internal-resource constraint). In the short term, when facing the problem of choosing among several mutually exclusive orders, the contribution to the unit of constraint must be examined and preference given to those orders that hold the promise of providing the highest contribution. This solution is typical of the Theory of Constraints (TOC) approach. Sometimes manufacturing decisions under constraints may be characterized as clear problems of linear programming, the solutions to which are relatively straightforward and known.

2. The Situation in Which in the Short Term there Exists an Excess Capacity. In this situation, management has the option of deciding whether or not it wishes to maintain the excess capacity for any length of time. If the answer to this strategic decision is positive, the contribution criterion will determine whether or not a job is accepted. Again, contribution means the selling price minus the real variable costs, — usually, the raw materials.

Sometimes, management decides to maintain the excess capacity, because it is anticipating orders in the medium term. In this case, short-term orders that promise a positive contribution to the firm will be preferred, in order to keep capacity open for receipt of orders in the medium term.

3. Activity-Based Costing. The above-mentioned solutions. which are based on the contribution principle, have demonstrated that in the short term there is no need to allocate indirect costs in making production decisions. However, as management's planning horizon lengthens, an analysis must be made of causes of indirect costs and their allocation. The costing system must give accurate expression, insofar as this is possible, to the factors giving rise to indirect costs. Consideration must be given to the fact that complexity of production and broadening of the range of products leads to an increase in indirect costs.

Decision-making tools — overall performance measures

■ Throughput - i.e., all the money that the company generates through sales. Units that are stored as finished goods and have not been sold yet are not considered as throughout.

■ Inventory — i.e. the dollar value of raw material, work in process and finished goods. The work in process and raw materials are measured by the costs of raw materials only.[4]

■ Operating Expenses — i.e., all the expenses involved in transforming inventory into throughput. Consideration must be given to the fact that it is unnecessary to distinguish between direct costs and indirect costs, or between fixed and variable costs.

■ Lead Time (or Response Time) — i.e., the time from receipt of order to delivery to customer.

■ Due Date Performance

■ Quality — this is measured primarily by the non-conformance costs (prevention, appraisal, internal and external failure costs). Estimation of these costs may be in terms of the process yield.

TOC methods have indicated the need to use overall performance measures for purposes of decision making. Originally three measures were suggested: throughput, inventory, and operating expenses (see Figure 1).[4] In our opinion, three auxiliary measures should be added to these three original measures: lead time, due date performance, and quality.

If we examine the classic decision problem of self-production against contracting out, we shall see that, in parallel with the immediate feasibility calculations derived from the incremental contribution, consideration must also be given to the implications of the decision concerning quality of production and the due date performance of the firm. If work is given out to a subcontractor, how can we assure quality of the required level? Will the decision cause a shortening or lengthening of the lead time?

The use of overall performance measures is likely, in our opinion, to serve as a guide to decision makers to make wiser decisions, in both the short term and the long term. **IM**

Notes

1.) Usually, in a firm in a state of full employment, there is a critical resource (a bottleneck), which must be taken into account in any decision making process. For further examples, see Y. Eden and B. Ronen "Service Organization Costing: A Synchronized Manufacturing Approach." *Industrial Management*, Sept-Oct 1990.

2.) In high-tech firms it is sometimes assumed that paper costs (preliminary planning, specifications, and operating instructions for the customer) comprise about 40 percent of the product cost. This is true primarily in one-time production of sophisticated items.

3) Robin Cooper and Robert S. Kaplan, "Measure Costs Right: Make the Right Decisions." *Harvard Business Review*, September-October 1988.

4) For an explanation of the OPT and TOC methods, see, for example, B. Ronen and M.K. Starr, "Synchronized Manufacturing as in OPT: From Practice to Theory." Computers and Industrial Engineering, August 1990; E.M. Goldratt and R. Fox, The Race, North River Press, 1986. E.M. Goldratt and J. Cox, The Goal, North River Press, 1986.