

Title	Criteria for the selection of the most profitable products
Sub Title	
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Publisher	慶應義塾大学藤原記念工学部
Publication year	1965
Jtitle	Proceedings of the Fujihara Memorial Faculty of Engineering Keio University (慶應義塾大学藤原記念工学部研究報告). Vol.18, No.71 (1965.) ,p.129(65)- 130(66)
JaLC DOI	
Abstract	
Notes	Summaries of Doctor and Master Theses Master of Engineering, 1965 Administration Engineering
Genre	Departmental Bulletin Paper
URL	https://koara.lib.keio.ac.jp/xoonips/modules/xoonips/detail.php?koara_id=KO50001004-00180071-0065

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Criteria for the Selection of the Most Profitable Products

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Any decision problem in corporate management usually involves selection of the most profitable action from a number of alternative actions. A capital budgeting decision, a selection of most economical production method, and a product mix decision are some of the examples of these problems. Selecting the most profitable product from a number of alternative products is another one of the commonly encountered decision problem. Here we need a criterion or an indicator on which the evaluation of the profitability of a product is to be based. The "Profit" and "Cost" of a product in the traditional accounting sense cannot be used to evaluate the profitability of a product.

To carry out an economic analysis of a product, the manager in charge of selecting products, needs to do the following two things:

1. Make theoretically clear the economic criteria needed in the selection of the most profitable product from a number of alternative products.
2. Examine his information gathering system, that collects gather and processes various accounting data on the product in question.

"Profit Maximization" of the firm is the ultimate objective of most corporate activities. Profit is defined as revenue less cost, or price minus cost. Thus profit is affected by both revenue and cost.

Now let us assume that profit will only be affected by cost, and consider the following simple examples.

Example : A company manufactures one unit of product *A* and *B* every day.

Process time needed for each unit is the same. Revenue and cost for this company are estimated as shown in Table I.

Table I.

	<i>A</i>	<i>B</i>
Sales	100	150
Cost of Sales		
Direct Labor Costs	25	25
Direct Material Costs	20	60
Overhead	40	60
Profit on Sales	15	50

Table II.

	<i>A</i> × 2	<i>B</i> × 2
Sales	200	300
Cost of Sales		
Direct Labor Costs	50	50
Direct Material Costs	40	120
Overhead	100	100
Profit on Sales	100	300

(thousand yen)

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Overhead cost is allocated to each product in proportion to the sales revenue. Let us now suppose that we decided to produce two units of product *A* only a day, product *A* being more profitable than product *B* in terms of profit as shown in Table I. Table II shows profit and cost for the cases where (1) only two units of *A* and no *B* are produced, and (2) only two units of *B* and no *A* are produced. If we are to choose between *A* and *B*, we will be better off in choosing product *B*, whose marginal profit is larger than that of product *A*, since our overall profit in this case will be larger than the profit obtainable from producing only *B* but no *A*. We have used the "marginal profit" as our criterion in this case. One thing we must note in connection with the example cited above is the fact that cost figures may not always vary proportionally to the quantity of the material or labor put into production.

Consequently, if we want to make an optimal selection of the product to produce, we must grasp the inter-relationship between various physical quantities and costs. This relationship, however, vary from time to time and also vary relative to varying conditions of production.

In selecting the most profitable product, the following items need to be considered :

1. Sales Volume
2. Quality Level
3. Production Method
4. Product Ordered
5. Price
6. Cost
7. Uncertainty (of demand)
8. Cost of Capital (inventory cost, interest paid, etc.)
9. Production Facilities (capacity, type, etc.)
10. Production Period

These are different types of optimum product selection problems.

The aim of this thesis is to classify these complex problems into three broad categories. A few actual problems are illustrated in this thesis with solutions.

The input-output theory and linear programming technique are applied to the solution of these specific problems. The input-output model developed here provide an useful technique in cost calculation, man-power estimation and budgetary formation.