The Profitability Index and its Impact on Sustainable Development Decisions

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ABSTRACT: The profitability index plays an important role in helping decision-makers, whether they are short-term decisions or long-term decisions, the profitability index is used in various ways to assist short-term decision-makers related to:
- By using scarce economic resources and developing the optimum production plan.
- Determining production lines or products that continue to work and those lines or products that are discontinued based on their profitability.
- Pricing of products.
- Granting incentives to salesmen.

These decisions are part of sustainability activities for any company, also, the profitability index is used in the comparison between long-term investment projects when the net present value criterion is positive for these projects, meaning that they are economically feasible, and it is necessary to choose some of them without the other.

KEYWORDS: differential analysis; scarce resources; profitability index; absolute profitability; Relative profitability

INTRODUCTION

Decision makers at all levels need quantitative tools that help them improve the quality of those decisions, whether they are short-term decisions or long-term decisions. Among these tools is the profitability indicator, as it affects to different degrees the decision-makers; In the field of pricing goods and services and in the field of differentiation between production lines as well as differentiation between long-term investment projects; Also, what distinguishes the profitability index is that it has two formulas, the first for measuring the profitability of projects in the short term, and the other used to select a specific project from among several investment projects.

Research Methodology:

Research problem:

The research problem is united by the fact that not using the profitability index in making short-term and long-term decisions leads to low-quality decisions regardless of the level and scope of those decisions and the activities in which they are taken.

Search objective:

The research aims to identify the great importance of the profitability indicator and its impact on many decisions taken by economic units in order to improve the quality of decisions taken by management in these economic units and add value to them.

RESEARCH IMPORTANCE

The importance of the research is highlighted by clarifying the relationship between the independent variable represented by the profitability index and the dependent variables represented by the following:
1- Product pricing decisions.
2- Decisions to grant incentives to salesmen.
3- The decision to add or remove a production line.
4- The decision to use scarce economic resources.
5- The decision to compare between investment projects with economic feasibility.

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RESEARCH HYPOTHESIS:

The use of the profitability index in a different form has a direct impact on the quality of many decisions taken by the administration at its various levels.

Theoretical framework for differential analysis

DIFFERENTIAL ANALYSIS CONCEPT

It is to determine the financial data that changes from one project to another when making future decisions in choosing a project without the other project, and the data may be revenues or costs, and costs or revenues or both may change when comparing alternatives or projects in making decisions and on For example, when comparing between the two projects, A and B, the company has the following data:

Detail	Project A	Project B
Revenue	50000000	45000000 dinars
Costs	40000000	40000000 dinars
Net income	10,000,000	5,000,000 dinars

When looking at the revenues, they differ from project A to project B, and they are called differential revenues. As for the costs, they did not change between the two projects, so they are called non-differential costs. The basic rule in differential analysis is the extent to which data changes between projects or different alternatives, regardless of whether the data represents variable or fixed costs or revenues. As for the data that does not change between projects or alternatives, it is called non-differential data even if the costs are variable in nature, for example. Direct materials are variable costs in nature, but if they do not change between the different alternatives, they are considered non-differential or inappropriate costs. In contrast, rental costs, as they are fixed costs, but when they change between alternatives, they are considered differential or appropriate costs (Naji & Muhannad, 2017: p. 147).

Base concepts in differential analysis

Relevant and irrelevant cost

Relevant costs are the elements of costs and revenues that differ from one alternative to another and are suitable for making short-term decisions. As for the inappropriate costs, they are costs and revenues that do not differ from one alternative to another and are not suitable for making decisions as they are fixed in all alternatives and are non-differential.

AVOIDABLE AND NON-AVOIDABLE COST:

The avoidable costs are the costs that can be omitted when choosing a project over another, and they are called differential costs or appropriate costs and are used in making decisions. They are differential or appropriate costs and are not suitable for making decisions because they do not change when comparing between possible alternatives, and for example, if you have two options, the first is to go to the mall and shop directly, and the second option is to order the goods you need by means of access, when you choose the first option Which is to go to the mall and shop directly, you avoid the costs of ordering the commodity through delivery and vice versa when you choose the second option and order the commodity by delivery, you avoid the costs of going to the mall and direct shopping (Garrison and other 2012, p: 528); and that the costs of each An option that can be avoided when you choose a specific alternative without the other alternative. On the other hand, the costs of renting the apartment or house in which the person lives cannot be avoided in either options or alternatives. Therefore, the costs of renting the An apartment or a house are non-differential costs and are not suitable for making decisions because the company will bear the rental costs in all cases, whether you shop directly or by delivery. Therefore, the costs that can be avoided are called appropriate costs of decision-making, while the costs that cannot be avoided are costs that are inappropriate for decision-making and are non-differential.

OPPORTUNITY COST

When choosing between projects or options, a project is usually chosen without the other project, and in this case, the company or person will lose the potential benefits obtained from the alternative that was not chosen. And the benefits that have been lost as a result of choosing an alternative without another alternative are called opportunity costs or lost opportunities, and they are differential costs and are used in decision-making. The opportunity costs may be added to the costs of the alternative that has been selected or subtracted from the revenues of the alternative that has been selected. For example, if you have two options, the first is a project to build a private hospital, and the second option is a project to build a private college. The details are as follows.

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DETAILS	FIRST OPTION (PROJECT TO BUILD A PRIVATE HOSPITAL)	SECOND OPTION (BUILD A PRIVATE COLLEGE)
Costs	1000000000	800000000 dinars
Revenues	750000000	600000000 dinars
Net income	2500000000	200000000 dinars

SUNK COSTS

If the first project is selected, the company will lose the net profit of the second option, which amounts to 200,000,000 dinars, which is called the opportunity cost, and vice versa, if the second project is chosen, the company will lose the net profit of the first option, which amounts to 2500,000,000 dinars, which is called the opportunity cost or lost. There are many applications for the uses of opportunity cost.

They are the costs that occurred in the past, and do not affect making current or future financial decisions. They are non-differential and inappropriate costs in making decisions. For example, if you have an amount of 100,000,000 dinars and it is used to buy a car, this amount cannot be used in the short term because the company has already used this type of costs called sunk costs that cannot be used in the short term. In general, there are two basic criteria that must be met in the data in order for the costs to be differential or appropriate in making decisions, which are:

First: it influences future decisions.

Second: it varies from one alternative to another. (Hilton, 2011, p: 600)

STEP IN THE DECISION MAKING PROCESS

There are seven basic steps in making decisions, and management accountants have an important role in them, which are as follows:

1-Clarify the decision problem

2- Specify the criterion that fits the problem

3- Identify the alternatives

4- Develop a decision model

5- Collect the data

6- Choosing the appropriate alternative or making a decision

7- Evaluate decision effectiveness (Hilton, 2011, p: 593)

Other consideration in decision making

There are two types of factors that influence decision-making:

First: qualitative or non-quantitative factors

There are two groups of factors that affect decision-making, the first group is called quantitative factors, that is, the factors that can be measured quantitatively or monetarily, and these factors are characterized by ease of measurement and expression, such as production costs, sales revenue and others. Qualitative factors that are difficult to quantify or express in quantities or amounts, for example, if a company takes a decision to remove a production line because it does not achieve profits, and here the quantitative factors of costs, revenues and profits were relied upon in making the decision, but the measurement was not taken into account The effect of qualitative or non-quantitative factors such as the effect of removing the production line on the morale of workers and the accompanying layoffs and related problems such as compensation of workers, and thus, non-quantitative factors can have great importance in making decisions.

Second: The relationship between differential analysis and the costing system based on activities.

There are problems related to the accuracy of allocating indirect industrial costs to units of production or services provided to customers when companies use the traditional costing system. At present, most companies in the developed world use the ABC activity-based costing system and this system helps in accurately determining the cost per unit. From direct and indirect costs, which helps the decision maker to take the appropriate decision for each case of differential analysis. The activity-based costing system would add value to such decisions because they are more accurate and better determine the profitability of the product or customer. (Kiso and other, 2011, p: 308)

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Figure (1) shows the influence of quantitative and non-quantitative (qualitative) factors on decision-making.

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┌──────────────────┐          ┌──────────────────┐
│ Qualitative      │          │ Quantitative     │
│ Factors.         │          │ factors          │
└──────────────────┘          └──────────────────┘

              ┌──────────────────┐
              │ Decision making  │
              └──────────────────┘

                   Evaluate
                   results
                   Decision
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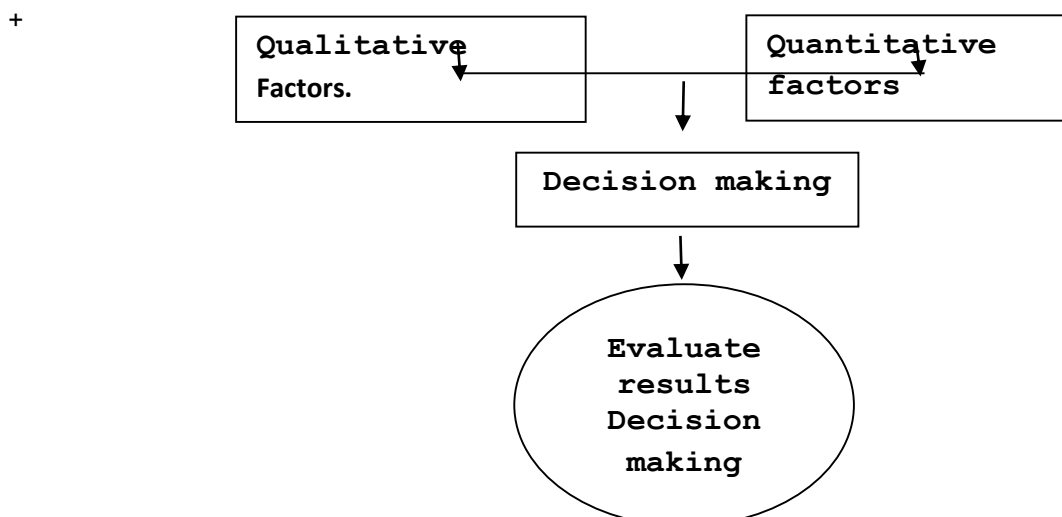
FIGURE PREPARED BY THE RESEARCHER

The qualitative factors resulting from the manufacture of the products of American companies in China:

As an example of the qualitative factors in the case of manufacturing the products of American companies in China, as the rates of labor wages in China are about 10% of the wages of work in the United States of America, so the cost of wages in China is very cheap, so many American companies have moved their factories to China to produce There, although the cost of transporting these goods from China to the United States is not small; However, companies that move their factories outside the United States of America should take into account qualitative or non-quantitative factors, for example, the products produced in China for these companies are of lower quality compared to those produced in the United States of America, and thus will harm The reputation of the United States of America, as well as the problems that arise because buying from China requires sea freight, which is a preferred method for delivering goods, and this means adding four to six weeks of time for goods to be delivered to the United States of America compared to shipping within the United States of America by trucks or Iron wire inside the United States of America, and because of the long delivery period, large-sized shipments are used, and this leads to an increase in the cost of maintaining inventory, and customers from within the United States of America will face the problem that the stock is old before it is fully sold, in addition to the risks of manufacturing defects that come From the shipping process, these are all qualitative or non-quantitative factors that are difficult to measure resulting from the process of manufacturing goods in China and transporting them She came to the United States of America due to the low rates of wages in China compared to America (James, 2010, p: 262)

TYPES OF DIFFERENTIAL ANALYSIS

Differential analysis includes many short-term decisions, which are as follows:

First: The decision to accept or reject the order.

The decision to accept or reject the order is based on the profits achieved by that order, taking into account the non-calculation of the costs of the elements that cannot be avoided because they are not affected in the case of acceptance or rejection of the order, which are inappropriate costs, while noting the fulfillment of the following two conditions:

1- The acceptance of the order is included in the production capacity of the company.

2-That the order does not affect the selling prices of the company's products.

Second: the decision to make or buy

The decision to manufacture inside the company or purchase from outside is based on the amount of costs of the two alternatives, manufacture or purchase, and depends on the alternative that achieves the lowest cost, taking into account the opportunity cost, if any, that is added to the costs of the manufacturing alternative without the purchase alternative.

Third: A decision to add or remove a product, service, department, or production line.

This decision depends on the losses resulting from the removal of the product or the production line and the costs that cannot be avoided when stopping it, then comparing the company's profits in the event of continuing production despite the loss achieved by the product or department that was suspended from work with the loss incurred by the company when stopping the production line or the product.

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Fourth: The decision to sell at the point of separation or to continue with additional industrialization operations.

Fifth: The decision to use scarce resources.

In many cases, it happens that the quantity of raw materials, the number of hours of operation of the machines, the hours of direct work, or the storage spaces are not sufficient to meet the demand for the volume of production. Therefore, the company sets an optimal production plan, and its essence depends on the contribution return for the scarce resource and not on the contribution return for the unit. Produced (in the case of a resource that is not scarce) in order for the company to achieve the maximum profit from the use of the scarce resource, and the scarce resource is considered a limiter or a restriction on production, and there is a theory called the theory of limitations or constraints used to address the restrictions or limitations that suffer from industrial processes in the company.

THEORY OF CONSTRAINTS

Modern management accounting has many techniques, and one of these techniques is the theory of constraints or determinants that are used in the continuous improvement of the company's activity, and this theory assumes that there is at least one determinant that limits the production capacity of the company and this technique works to address the constraints or determinants that suffer Including the company in a simple way so that these determinants are treated one by one with the aim of increasing production capacity and achieving the maximum possible revenues for the scarce resource or these constraints. At the same time, an optimal production plan is developed that takes into account the optimal use of constraints or scarce resources (raw materials, or working hours). And not on the basis of the contribution return per unit produced.

Step of the theory of constraints in the treatment of determinants (a scarce resource)

1- Determine the limitations or scarce resources that the company suffers from

2- The optimum use of the determinant or scarce resource so as to achieve the maximum contribution return for the company

3- Adapting the economic resources of the company in light of the constraints or the scarce resource

4- Taking the necessary and necessary measures to activate the role of determinants or scarce resources (Naji, Jinan, 2011, p: 129).

THEORETICAL AND PRACTICAL FRAMEWORK FOR PROFITABILITY INDEX.

Companies with their various activities always seek to know the profitability of each of their products or customers, as well as the profitability of the rest of their activities. Also, the company collects data about its activities and divisions to determine which products or sections are making profits and the others that are making losses, and therefore the focus is on profitable products and perhaps thinking about closing or removing the departments or products that make a loss. Two concepts of profitability that you should know are the concept of absolute profitability and relative profitability.

THE CONCEPT OF ABSOLUTE PROFITABILITY

It is the amount of impact on the company's total profits as a result of adding or removing a production line, a specific product, or a customer without making any other changes. For example, when the Baghdad University College of Economic Sciences thinks to stop the Department of Computer Science because it is making losses or because its profits are few compared to other scientific departments, the college administration will think about the extent of the impact on the absolute profitability as a result of the suspension of the Department of Computer Science. The measurement of absolute profitability is done by A comparison between the revenues that the college will lose as a result of stopping that department and the costs that are avoided as a result of the suspension process. As for the rest of the other costs, they are ignored because they do not enter into decision-making and are non-differential. At the same time, when making the decision to add a scientific department to the college, the comparison is made between the differential revenues derived from adding a section of the departments and the differential costs incurred by the college as a result of that. What is meant by differential costs are the appropriate costs that can be avoided, while neglecting the non-differential costs that do not affect decision-making, given that these costs are borne by the college in all cases and under any of the alternatives? From a scientific point of view, determining the differential costs that can be avoided and the non-differential costs that do not change according to the different alternatives, i.e. non-differential or inappropriate costs, as the first alternative is the continuation of the college departments to work despite the loss of one of them, while the second alternative is to stop the Department of Computer Science, which achieves Loss and that dealing with the costs that cannot be avoided as a result of stopping the computer science department is not an easy thing, as it requires analyzing costs on the basis of activities and this helps in determining them more accurately. Determine the appropriate costs that are suitable for taking the decision to add or delete the scientific department, and that closing the Department of Computer Science requires studying the costs that cannot be avoided as a result of stopping that department and their impact on the profitability of the

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college. These costs are inappropriate and cannot be avoided unless work continues in all departments The College or some of them are suspended, they are costs borne by the college in all cases, and these costs must be excluded when measuring the absolute profitability of those departments expected to be closed. It is worth noting that colleges in some countries will provide support to employees in those departments that are expected to be closed.

The concept of relative profitability

Absolute profitability means achieving profitability for the whole company, while the company's management wants to know which of the divisions achieve the most or least profitability, so the relative profitability means knowing the ratio of the profitability of each division to the total profitability of the company and in order to determine which of the divisions achieve high profitability Hence, focus is placed on these profitable divisions without any other divisions that have a low profitability ratio. The college has endeavored to continue the work of each department that achieves profitability, regardless of its relative profitability. It may happen that there are determinants facing the work of the college related to the provision of economic resources and the requirements of the educational process.

From both determinants, the available spaces or classrooms and working hours are the main determinant or constraints of the educational process, which requires the college to determine the relative profitability in the light of the determinants facing each department, and in general the departments that achieve absolute profitability should be monitored and continued.

Relative profitability is measured by dividing the profitability of each department by the absolute profitability of the whole college, noting the determinants (lack of classrooms, available spaces, professors, or working hours) for each department, as shown in Figure (2).

Figure No (2) Shows the Differential Profit and the Amount of Scarce Resource for Each Department

Details	Accounting Department	Business Administration
Differential profit	200,000 dinars	100,000
Quantity required	400 hours	100 hours

From Figure (2), the accounting department seems more attractive than the business administration department, because it achieves double profits than the labor management department, but at the same time it requires four times the amount of scarce resource needed by the business administration department.

Thus, the profitability of the rare resource for the accounting department is 200,000 ÷ 400 hours = 500 dinars, the amount of profit per hour from the rare resource, while the business administration department, the profit per hour from the rare resource is 100,000 ÷ 100 = 1000 dinars, and thus the profitability of the business administration department is the most at Taking into account the limitations (a scarce resource).

In other words, if we assume that the number of hours available from the scarce resource of Baghdad College of Economics is 400 hours, is it better to use it in the accounting department to generate a profit of 200,000 dinars, or is it used in the business administration department to generate a profit of 100,000 dinars as differential profits, and in general, the relative profitability should To be measured using the profitability factor for projects or short-term decisions, as follows:

Profitability index = differential profit for the division ÷ amount of scarce resource required for that division

Figure (3) Shows How to Calculate the Profitability Index for Baghdad College of Economics and for Each of the Accounting and Business Administration Departments.

Details	Accounting Department	Business Administration
Differential profit	200,000 dinars	100,000 dinars
Quantity of scarce resource	400 hours	100 hours
Profitability index	500 dinars per hour	1000 dinars per hour

The profitability index can be used to evaluate long-term projects or investment projects, using the following formula:

Project profitability index = net present value of the project ÷ initial cost of the investment project

As the profitability index is used to compare between long-term investment projects when the company or investor has several long-term investment opportunities and that the net present value of these investment opportunities (projects) is positive, that is, they are fit for investment from an economic point of view, and for the sake of differentiating between these projects that passed the net test Present value successfully and choosing the best one, we take the cost factor of the investment project as a determinant of investment that may play an important role in choosing a specific project among several projects whose net present value is positive.

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Figure (4) shows the impact of the scarce resource on short-term investment decisions when using the profitability index of a company to design and manufacture kitchen counters for high-end homes. The differential costs incurred by the company as a result of accepting the projects and that the scarce resource (the constraint) is represented by the time of the chief designer of the kitchens. But the actual available hours (the scarce resource) are only 46 hours, so the company will differentiate between these projects submitted to it on certain bases and will accept some and reject others in light of the availability of the specified (the time needed to design kitchens). In order for the company to take the appropriate decision to accept or reject projects, it extracts the profitability index for short-term projects or offers submitted to it, according to the following formula.

Profitability index = Differential profit for each project ÷ Hours required for the lead designer for each project

And in the case of the first project, the profitability index is 540 dinars per hour of design, and when calculating the profitability index for all the offers presented to the company, it will be as in Figure (4)

Figure (4) Shows the Calculation of the Profitability Index for Each Short-Term Project (Offer).

Project	Differential Profit	Available Hours of scarce Resource	Profitability Index
Revenues -Costs	Designer Hours	Differential Profit ÷ Quantity of scarce Resource	
First project	9180 dinars	17 hours	540 dinars per hour from the scarce resource
Second project	7200 dinars	9 hours	800 dinars per hour from the scarce resource
Third project	7040 dinars	16 hours	440 dinars per hour from the scarce resource
Fourth project	5680 dinars	8 hours	710 dinars per hour from the scarce resource
Fifth project	5330 dinars	13 hours	410 dinars per hour from the scarce resource
Sixth project	4280 dinars	4 hours	1070 dinars per hour from the scarce resource
Seventh project	4160 dinars	13 hours	320 dinars per hour from the scarce resource
Eighth project	3720 dinars	12 hours	310 dinars per hour from the scarce resource
Ninth project	3650 dinars	5 hours	730 dinars per hour from the scarce resource
Tenth project	2940 dinars	3 hours	980 dinars per hour from the scarce resource
100 hours			

When arranging projects (offers) according to the profitability of the scarce resource (the number of hours of the chief designer), and when arranging projects (offers) according to the profitability of the rare resource (the number of hours of the chief designer)

Figure (5) Shows the Ranking of Projects According to their Profitability Per Hour from the Scarce Resource, as Follows:
Figure (5) shows the ranking of projects according to the hourly profitability index.

Details	Profitability index	Hours required	Hours used
Sixth project	1070 dinars per hour	4 hours	4 hours
The tenth project	980 dinars per hour	3 hours	7 hours
The second project	800 dinars per hour	9 hours	16 hours
The ninth project	730 dinars per hour	5 hours	21 hours
Fourth project	710 dinars per hour	8 hours	29 hours
The first project	540 dinars per hour	17 hours	46 hours
The third project	440 dinars per hour	16 hours	62 hours
Fifth project	410 dinars per hour	13 hours	75 hours
Seventh project	320 dinars per hour	13 hours	88 hours
Eighth project	310 dinars per hour	12 hours	100 hours

After that, the optimal production plan is prepared for the use of the scarce resource so that it achieves the highest profitability for the company according to the determinants of the scarce resource, as shown in Figure (6).

Figure (6) Shows The Optimal Production Plan For A Kitchen Design Company.

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Project Sequence	Differential profit for each project in light of scarce resource
Sixth project	4280 dinars
Tenth project	2940 dinars
Second project	7200 dinars
Ninth project	3650 dinars
Fourth project	5680 dinars
First project	9180 dinars
Total differential profit	32930 dinars

The profitability index depends mainly on the differential profit, and when calculating the differential profit for a particular sector, producer, customer, department, project, the differential costs of that sector or project must be taken into consideration, and these costs include differential costs, i.e. costs that can be avoided, whether they are fixed costs or variable, and when that department or project is removed, costs that are not differential or inappropriate should be neglected, including overhead costs that are used in the company.

Differential between Decisions

The profitability index is used to compare between decisions taken within the framework of the operating budget when scarce resources are not sufficient to meet the production need, so the company may not be able to meet all the orders for its products and this is called the decision to compare between products as the trade-off depends on the margin or profit return that it achieves The scarce resource and not on the normal profit margin that is achieved from the sale of products, and that fixed costs usually do not affect such decisions because they are unavoidable costs or they are not differential.

Profitability index for differentiating between decisions related to short-term projects = Contribution return per unit ÷ Quantity of scarce resource required for unit production.

The profitability index is identical to the contribution return for each unit of the scarce resource, as shown in Figure (7), as it shows that the kitchen design company produces three types of kitchens and uses the same specific scarce resource for production, represented by the number of minutes available per week to operate the machines, and the number of The available minutes are 2200 minutes per week, while the company's need to design kitchens is 2700 minutes per week. This means that the company cannot meet the entire demand for its products, so its production is determined on the basis of the contribution margin of the scarce resource (one minute) for each product and as a place in step (2) of Figure (7).

The profitability index was calculated as in step (3) of Figure (7), so the profitability index for the product RX200 is 3 dinars per minute and the profitability index for the product VB30 is 5 dinars per minute, and the profitability index for the product SQ500 is 5 dinars per minute and accordingly the ranking Products according to the contribution return for the scarce resource and are as follows:

1- The typewriter is   VB30

2- The typewriter is SQ500

3- Imprinter Type   RX200

 Then the optimal production plan is developed as in step (4) of Figure (7), and production is carried out according to the quantity of demand and the remaining time from the scarce resource, and thus 200 units of kitchens are produced from the original demand of 1000 units of the product RX200 and this is extracted from Dividing the remaining time from the scarce resource by 5 minutes is the time required to produce one unit of this type of kitchen, and the total contribution return for the rare resource (minutes) is shown in step (5) of Figure (7), where the total contribution return is 8600 dinars, which is the highest margin A contribution that the company obtains from any other production plan that uses the scarce resource and assuming that the fixed costs are not affected by the decision to focus on some types of kitchens.

Figure (7) it shows the use of the profitability index in differentiating between production decisions in light of the scarce resource

First Step: production data

Details	RX200 Product	VB30 Product	SQ500
Contributions per unit	15 dinars per unit	10 dinars per unit	16 dinars per unit
Weekly order	300 unit	400 unit	100 unit
Required quantity of scarce resource one unit	5 minutes per unit	2 minutes per unit	4 minutes per unit to produce one unit

Second Step: the total volume of demand for the scarce resource (minutes)

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Details	RX200	VB30	SQ500	TOTAL
Weekly order volume	300 unit	400 unit	100 unit	800 unit
Quantity required	5 minutes	2 minutes	4 minutes	
Total quantity required	1500 minutes	800 minutes	400 minutes	2700 Weekly

Third Step: Calculate the profitability index

Details	RX200	VB30	SQ500
Contribution per unit	15 dinars per unit	10 dinars per unit	16 dinars per unit
Required quantity	5 minutes per unit	minutes per unit	4 minutes per unit
Profitability index	3 dinars per minute	5 dinars per minute	4 dinars per minute

Fourth Step: the optimal production plan.

Available quantity from the scarce resource (number of minutes)	2200 minutes
Quantity required from scarce resource to produce 400 units of product VB30	800 min
Remaining quantity (minutes) from the scarce resource	1400 minutes
Quantity required from scarce resource to produce 100 units of product SQ500	400 min
Remaining quantity (minutes) from the scarce resource	1000 minutes
Remaining quantity of scarce resource to produce 200 units of product RX200	1000 minutes
Remaining quantity of scarce resource (minutes)	Zero

Fifth Step: the total contribution return for the scarce resource in light of the optimal production plan

Details	RX200	VB30	SQ500	TOTAL
Contribution margin per unit	15 dinars per unit	10 dinars per unit	16 dinars per unit	
Optimum production plan	200 unit	400 unit	100 unit	
Total contribution margin	3000 dinars	4000 dinars	1600 dinars	8600

Calculating and using the profitability index in administrative decisions

The profitability indicator can be used in different ways. In addition to its use in making short-term decisions (removing a production line) and long-term decisions (the differentiation between investment projects on the basis of the cost of the investment project), it is also used to choose the products that the salesperson focuses on by identifying low-profitability products. And high profitability products, as salesmen are usually given incentives and commissions on products with a higher profitability index. For example, if the selling price of the three products is RX200, VB30, and SQ500 are as follows:

Products	RX200	VB30	SQ500
Unit selling price	40 dinars	30 dinars	35 dinars

If the salesmen get the sales commission on the basis of the total sales they sell, it is preferable to sell the product RX200 because its price is the highest, but when looking at the profitability of the products on the basis of the scarce resource, the product RX200 is the least profitable among the three products. As the profitability index for the scarce resource (one minute) for the product RX200 is 3 dinars per minute, 5 dinars per minute for the VB30 product, and 4 dinars per minute for the product SQ500. This indicates that the sales commission should be paid based on the profitability index of the scarce resource (minutes) instead of the sales revenue, which encourages salesmen to sell the most profitable products instead of the products sold at the highest selling price per unit; The salesmen are usually provided with updated reports indicating the required scarce resource quantity and profitability indicator, as in the following report

Marketing report Product

Details	RX200	VB30	SQ500
Unit selling price	40 dinars	30 dinars	35 dinars
Variable cost per unit	25 dinars	20 dinars	19 dinars
Contribution margin for the unit	15	10	16 dinars
Required quantity of scarce resource	5 minutes	2 minutes	4 minutes
To make the unit			
Profitability index	3 dinars per minute	5 dinars	4 dinars

Note that the total amount of available scarce resource is 100 minutes

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The essential point is that the salesperson prefers to sell the product VB30 because he will get sales of 500 dinars (100 minutes or the total of the scarce resource x 5 dinars per minute or what the unit needs from the rare resource), while the sales amount for the product RX200 will be 300 dinars and The sales amount for the product SQ500 will be 400 dinars, and based on the total return on the contribution, incentives are provided to the sales representatives. If all the available scarce resource (100 minutes) is used in making the product VB30, the number of units produced from it will be 50 units (100 minutes ÷ 2 minutes per unit). The total contribution margin is 500 dinars, i.e. (50 units x 10 dinars contribution revenue for the supplier), and in a similar way, the total contribution margin for the three products above will be 500, 400, 300 dinars respectively if all the scarce resource (100 minutes) is used in the manufacture of those products.

Also, the profitability indicator affects the pricing of new products. Suppose that the company designed a new product called WR6000. The variable cost of the unit is 30 dinars, and each unit needs 6 minutes from the scarce resource, and because the company is currently using all its production capacity, the new product will replace one of the products Therefore, the selling price of the new product will cover the variable cost in addition to the opportunity costs that were lost as a result of removing the old product and producing a new product in its place. And here, the product that achieves the least profitability, which is the product RX200, has been removed, and this product achieves a contribution margin for the scarce resource of 3 dinars per minute, which is the same as a profitability index for this product RX200. Therefore, the selling price of the new product should at least cover those costs, as follows:

The selling price of the new product < or = the variable costs of the new product + [the opportunity costs of one unit of the scarce resource x the quantity of the scarce resource required to produce one unit of the new product] = 18 dinars {3 dinars contribution margin for the scarce resource x 6 minutes}, The selling price of the new product WR6000 will be at least 48 dinars (30 dinars + 18 dinars), Or that the company continues to produce the old product RX200.

CONCLUSIONS AND RECOMMENDATIONS

First: The Conclusions

1- The differential analysis provides the feature of excluding fixed costs when they are not differential or any non-differential costs when making decisions, while the non-differential analysis depends on calculating fixed and variable costs, which leads to low quality decisions.

2- The profitability indicator in most of the accounting literature is used within the criteria of the capital budget and the operating budget.

3- The use of scarce resources in economic units requires the use of the theory of determinants in dealing with the limitations or constraints resulting from the scarcity of economic resources.

Second: Recommendations

1- The necessity of adopting differential analysis in making short-term decisions, due to its effective contribution to improving the quality of those decisions, such as the pricing decision; The decision to grant incentives to salesmen; The decision to add or exclude a specific product and others.

2- Determining scarce economic resources requires that production plans be built on the basis of the contribution return for the scarce resource and not on the basis of the contribution return for the unit sold, and this is called the optimal production plan.

3- The profitability indicator criterion is of great importance in use, as it can be used in more than one formula in short-term and long-term decisions, and the appropriate use of it will add value to those decisions and then economic units.

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