Economic Rationale for Calculating Enterprise Costs using the "Direct-Costing" System

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Abstract: - In the article, we have prepared a practical recommendation for calculating the cost of bakery products based on the distribution of additional costs, taking into account the marginal revenue, assortment optimization, and field characteristics, which affect the growth of income and economic growth as a whole, using the "direct-costing" alternative option of the enterprise in the field of costs management. It is a normative method for calculating the production costs of the "Cost-standard" system and their calculation. It includes methods of determining the rate of consumption of production resources and calculating the normative cost of the product.

Key-Words: - direct costing, enterprise costs, cost price, regression analysis, marginal revenue.

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1 Introduction

It is clear from the activity of bakery enterprises that the true indicator of the cost value should be calculated only from the point of view of its economic essence, which arises from the requirement of managing this enterprise in a complex market environment. To this end, a comprehensive research project needed to be implemented to assess the main prospects for implementing new SCM practices, [1].

Let's clarify the possibilities of applying the "direct-costing" system to enterprises of the baking industry.

Making "cost-standard" management decisions allows the manager to strategically evaluate the value of the produced product and the forecasted income, to conduct reports on responsibility centers, [2].

We have conducted the study of the "direct-costing" system, i.e., the incomplete costing system, in two directions (Figure 1).

The modern interpretation of the "direct-costing" system is to divide production costs into fixed and variable costs depending on the change in product volume. Fixed costs are not included in the cost of a single product during calculation.

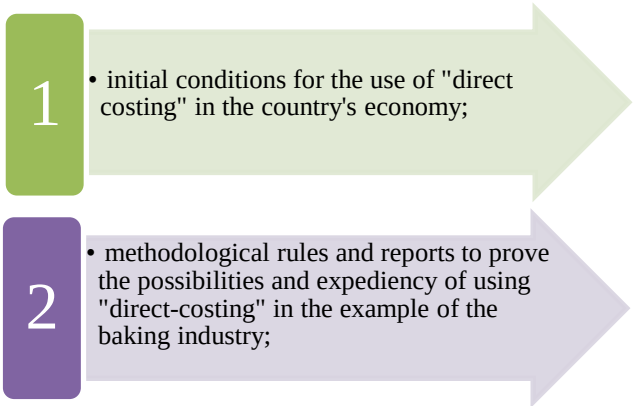

Fig. 1: Directions of face value
Source: [7]

This clarifies the whole sequence of how the value of the rings in the chain arises and increases, as well as the question of the creation of value added, the exact definition of value-added as the product passes from one ring to another, and how to become a constant quantity, [3].

The "Direct-costing" system is used to determine profitable or unprofitable production depending on the volume of production, to calculate the critical point of product production, to forecast the cost, as well as to calculate various costs taking into account the volume of production and to determine the more profitable variety of the product, the formation of

the cost value, the produced product allows to optimize the range, [4].
With this, opportunities are created for the successful solution of strategic management issues of the enterprise.

2 Summary of References

The theoretical substantiation of this system dates back to the 18th century. As such, A.M. Saigidmagomedov proposed to attribute the main costs to its separate phases, and the additional costs - directly to the account of the result during this period, [5]. However, in the works of other authors, the main signs of the division into fixed and variable costs were not shown.

V.F. Pali shows that this sign was defined by Dc. Clerk. It refers amortization of fixed capital, maintenance of administrative and technical staff to fixed costs, and costs of equipment adjustment to the sum of free capital income, [5].

Variable costs include costs related to the operation of raw materials and materials, electricity, labor, and equipment, which vary depending on the volume of other production, [6].

As market relations developed, "direct costing" was gradually introduced in bakery enterprises of Azerbaijan.

The increase in competition between these separate commodity producers, the struggle for the sales market, and the search for a new segment in the market are related to the increase in costs incurred in the adoption and advertising of a new product type, and in market research.

For example, S.A.Stukov refers to the advantage of the "direct-costing" system as follows: "Limiting the cost of the product only to variable costs allows to simplify normalization, planning, accounting and control of sharply reduced cost items: the cost is "more understandable", and other costs - well controlled, [7].

3 Analysis and Assessment

Many economists object to the use of "direct costing". They explain this by the fact that it is unreasonable to exclude fixed costs from the cost price because those costs are directly involved in the production process of the product, [8]

In addition, it is not correct to determine the full cost of the product using "direct costing".

In our opinion, these objections cannot be an argument for the application of the "direct-costing" system, and the full cost of the product calculated through it performs its function.

One of the most important conditions during the organization of cost accounting with the "direct-costing" system is the correct allocation of these costs to fixed and variable costs. The problem here is that the same type of expenses can be allocated to different types for different businesses, [9].

However, to overcome this difficulty, standard programs of correlation analysis and pair regression should be used to determine the relationship between costs and production volume.

In general, the issue of traditional optimization of the range and the implementation of the "direct costing" system are given in Table 1.

If the regression analysis gives the dependence between the price of any cost item and the volume of production that is close to a straight line, then if the correlation coefficient is close to 1, variable costs will prevail in the composition of production costs.

If the correlation coefficient approaches zero, then production costs have a weak effect on output and can be called fixed costs, [10].
As can be seen from the table, the fundamental difference in both problems is that each of them has a maximum of half.

Despite the increase in the number of tools stimulating the economic activity of market participants, the problem of confidence has not only lost its actuality but has also begun to have an increasing impact on economic development.

Table 1. The issue of traditional optimization of the variety and the introduction of the "Direct-costing" system

Setting the issue of optimizing the range in consideration of the full cost	Setting optimization issues based on "direct-costing".
$\text{Max.}F\Sigma\ J_cX_c$ – total income; $\Sigma\alpha_{ic}x_c \leq b_i$ – limitation on the raw material; $X_{ic} \geq 0$ J_c – c income per unit of the data of the type ;	$\text{Max.}F\Sigma M_cX_c$ – total marginal income; $\Sigma\alpha_{ic}x_c \leq b_i$ – limitation on the raw material; $X_{ic} \geq 0$ M_c – marginal income per unit of c type of product;
X_c– production volume of this type of product; α_i – c the rate of income of the type of product, I type of raw material; b_i - volume of I-type raw material.	

In the first case, it is total revenue, and in the second case, it is total marginal revenue, whose price is found as the difference between sales revenue and variable costs, [11].

Table 2. Initial data for regression analysis

Months	Release of product	Cost models mln. [AZN]						
		Inclusion of raw materials and materials TZP	Fuel and electricity for technological requirements	Wages of production workers	Social allocations	General production costs	General economic expense	Unplanned costs
January	1722,8	3245,1	69,0	210,99	54,0	330,8	837,62	73,23
February	1815,7	3405,85	73,19	218,0	54,09	335,48	846,99	73,9
March	1863,4	3495,37	72,87	216,56	57,08	357,7	838,7	70,8
April	1972,5	3683,29	75,85	2223,09	55,15	331,79	840,32	77,77
May	1946,7	3637,52	75,13	222,24	57,13	333,68	849,35	76,21
June	1828,9	3433,74	71,40	213,41	53,06	334,22	838,18	75,36
July	1707,5	3216,68	68,63	207,48	53,99	331,74	850,38	71,28
August	1644,3	3105,75	66,89	206,43	51,95	331,49	837,44	73,69
September	1689,3	3184,99	568,12	210,89	52,17	330,64	836,12	75,11
October	1717,4	3238,29	68,88	206,80	54,99	354,78	836,53	77,26
November	1712,2	3225,18	68,74	214,64	55,0	333,76	840,46	76,16
December	1782,9	3352,09	70,67	209,92	56,72	334,81	838,50	70,21

It can be seen from Table 1 that the costs of raw materials, fuel, and electricity are mainly variable: the average monthly share of variable costs is 93.64% and 69.36% respectively (Table 1). Similarly, the Initial data for regression analysis are presented in Table 2.

Expenses allocated to employee salaries and social deductions are attributed to variable expenses and are 40.94% and 34.4%, respectively. The types of variable costs are presented in Figure 2.

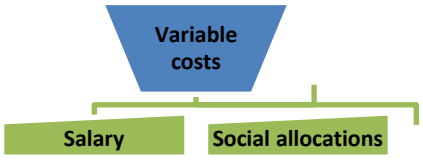

Fig. 2: Types of variable costs.
Source: [12]

Traditionally, these types of costs were considered entirely variable, and their cost was attributed entirely to the cost of the finished product.

Table 3. Results of regressive analysis

Article of costs	The average price of given costs	The pair correlation equation	Pair correlation coefficient	Share of fixed costs	Share of variable costs
1	2	3	4	5	6
Inclusion of raw materials and materials TZP	3352,03	Y=1,7597X + 213,31	0,999	6,36	93,64
Fuel and electricity for technological requirements	70,77	Y= 0,0275X +21,686	0,9848	30,64	69,36
Salaries of production workers	213,37	Y= 0,0489X+126,018	0,895	59,06	40,94
Social demand allocation	54,61	Y=0,0105X +35,82	0,6237	65,69	34,41
General production costs	74,25	Y=0,009656X+319,519	0,1084	9994,88	5,12
General household costs	336,74	Y=0,0148X+814,059	0,3257	96,85	3,15
Commercial costs	84,25	Y= 0,005886X+63,75	0,2436	85,86	14,14

Source: author's work.

Such a semi-fixed-semi-variable nature of the salary is explained by the fact that there were no changes in the staff table of the enterprise during the considered period [one year], and therefore the payment of the salary remained practically constant every month.

If we look at the change of these costs for a longer period [3-4 years], it is clear that then we would get another option, that is, we would see more clearly that the costs are variable.

The analysis shows that production, farm, and commercial costs as a whole are fixed (94.88%, 96.85%, and 85.86% for fixed costs respectively).
There is also a certain share of variable costs. The biggest price is in unrealized costs -14.14%.

This can be explained by the fact that the additional increase in output over the period under review led to a proportional increase in the cost of delivering it.
This research realizes that people positive impact on the lives of the inhabitants of the country, [12].

4 Suggestion

We propose the following criteria to characterize the demand in bakeries.
According to the frequency coefficient of orders:

$$K_{s.t.} = \frac{the\ number\ of\ days\ when\ orders\ were\ placed}{number\ of\ workforces\ duri\ \#g\ the\ period\ under\ review} \quad (1)$$

According to the number of orders during the considered period, the given values of the criteria for each enterprise will be individual. According to them, the nature of the demand can be conditionally divided into the following (Figure 3).

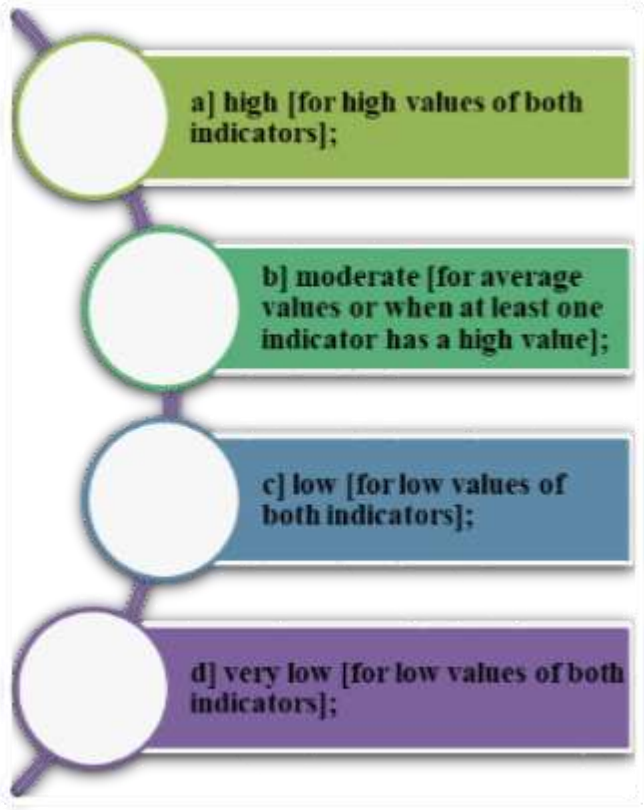

Fig. 3: Criteria for enterprise
Source: [7]

The distribution provided is conditional. However, when grouping is carried out in a separate enterprise, more precise limits can be adopted according to the type of requirements.

In our case, for a very low, moderate product demand, we recommend placing the actual release by last year's volume, and for a high-demand product, we recommend including limit by capacity.

5 Conclusion

Conducted studies show that the optimal programming calculated by the "direct-costing" system gives 7.43% more income than the calculation by the traditional method.

The advantage of the "direct-costing" system is that it not only defines the product strategy more specifically but also allows one to determine the corresponding costs and the indicated income, [13].

With its help, we can get information about the fixed costs that the enterprise has to pay even if it does not produce anything. Both problems were solved with the help of the simplex method of linear programming.

Thus, by applying the "direct-costing" system, the enterprise will know below which level the income cannot fall to avoid losses.

Besides these, the regression analysis will allow us to know the trend of the change in the cost value and its elements quite accurately.

The production program calculated by the "direct-costing" method, as a rule, in natural terms, gives a few percent more income in the low-volume release of the product.

Thus, there is a reason to consider this method more accurate, as its application allows to elimination of the variable and different effects of the invested money from the fixed costs that appear during the most traditional distribution of costs.

The above-mentioned method of optimizing the production program can be applied to both small bakeries and large bakeries, [14].

In small bakeries, the range is not very large, and the cost forecasting reports will not be very difficult therefore the volume of output will be easy to manage.

A variant approach to cost formation is also important for large-scale bakery enterprises, where the number of assortment groups is quite large and requires regular assortment changes in accordance with changing market conditions.

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Contribution of Individual Authors to the Creation of a Scientific Article (Ghostwriting Policy)

- Nasrullayeva Gunash and Mehriban Magerramova carried out the simulation and the optimization, Resources.
- Mehriban Yusifova has organized and executed the experiments of Methodology.
- Rahimova Samaya has organized and executed the experiments of Validation.
- Sevinc Magerramova was responsible for the Statistics.

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Conflict of Interest

The authors have no conflict of interest to declare.