

ON OPTIMIZATION OF THE PERFORMANCE OF EQUIPMENT. ACCOUNTING OF COST OF PRODUCTION OF THE ENTERPRISE

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Abstract. In this paper we introduced an approach for estimation of optimal performance of products. The analysis of this performance with the aim of formulating recommendations to reduce its cost.

Keywords: estimation of performance of products; reduction of product's cost.

INTRODUCTION

One of the main factors for optimization of functioning of industrial enterprises is increasing of profits, as well as decreasing of production costs [1-4]. In this situation it is necessary to develop effective methods of innovative development, leading to a decreasing of overhead costs in the production of products [5-8]. In this paper, a model for forecasting the revenue of enterprises with account of changes of volume of production has been introduced. An analytical approach for predicting the performance of equipment, taking into account the cost of production of the enterprise, was also proposed and its analysis was carried out in order to reduce the cost.

METHOD OF SOLUTION

The cost of a unit of output will be determined using the following ratio

$$S=S_1+S_2V+S_3/V, \quad (1)$$

where V is the performance, which considered as constant during the working period; the coefficients S_1 , S_2 and S_3 take into account various production factors. For example, the coefficient S_1 is determined by the mass of the raw materials and the mass of manufactured products, the cost per unit of raw materials, the cost of energy consumed; S_2 coefficient is determined by the cost of raw materials used; S_3 coefficient is determined by the cost of energy consumed and the salary of staff. The choice of optimal performance is determined by the standard procedure, i.e. from the condition that the derivative of function (1) is zero for enterprise V

$$\frac{\partial S}{\partial V} = S_2 - \frac{S_3}{V^2}. \quad (2)$$

From the condition of equality of derivative (2) is zero we obtain the optimal performance value

$$V = \sqrt{S_3 S_2^{-1}}. \quad (3)$$

DISCUSSION

In this section, we analyze the performance of products in the framework of this model. In fig. 1 shows the dependences of the cost price of a unit S of manufactured products on enterprise productivity V for various values of S_i coefficients. From this figure it follows that the dependence under consideration may have a minimum. The minimum coordinate depends on the values of parameters S_2 and S_3 . These dependencies are monotonically increasing and monotonously decreasing, respectively.

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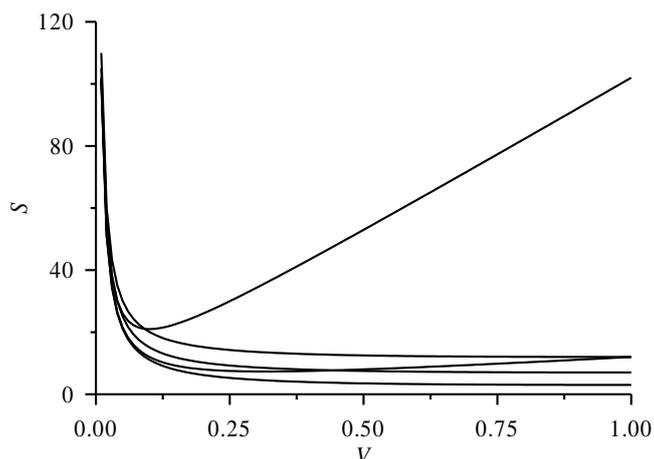


Fig. 1. Dependencies of the cost price of a unit S of products on enterprise productivity V for different values of S_i coefficients.

CONCLUSION

In this paper we introduced an approach for estimation of optimal performance of products. The analysis of this performance with the aim of formulating recommendations to reduce its cost.

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