

THE CHARACTERISTICS OF THE COST OF PRODUCTIVE FACTORS IN DYNAMICS OF ENTERPRISE'S ECONOMY *

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Dragiša Grozdanović

The Faculty of Economics, University of Niš, 18000 Niš, Yugoslavia

Abstract. *Proceeding from the fact that the cost of productive factors include labour costs, instruments of labour cost, and subjects of labour cost, the paper analyzes the basic characteristics of dynamics of cost of each productive factors and the effects of their influence on dynamics of enterprise's economy.*

1. INTRODUCTION

In the economic analysis, productive factors include: labour, instruments of labour and subjects of labour. So, if costs of reproduction is differentiated on the productive factors, we could analyze labour costs (1), instruments of labour cost (2), and subjects of labour cost or material costs (3). The costs are influenced by numerous internal and external factors. The factors are regularly changed in the dynamics of reproduction, which changes the cost of productive factors.

From the standpoint of dynamics of business success, the amount and, especially, the dynamics of economy's rate has multiple importance. Since the economic content of economy is in accumulative capability of enterprise, the rate of accumulation is determined just by the dynamics of economy. Such mutual interdependence is also important both for the dynamics of profitability and economy. Therefore, in analysis of the dynamics of economy it is necessary to research and project: first, the basic characteristics of dynamics of each productive factor cost, and, second, effects of their influence on dynamics of economy.

The results of this analysis gives an insight into dynamics of economy as well as some important elements for researching characteristics of relation between the productive factor costs and managing costs and economy in their dynamics. Taking into consideration the scope of the paper, those aspects will be the subject of another paper.

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2. THE LABOUR COSTS IN THE DYNAMICS OF ECONOMY

The objective labour costs (TI) in given period of time are a result of effects of internal and external factors on the scope of objective labour (L) and the level of market earnings (CI), so: $TI = L \times CI$. In the succession of periods, objective and realized costs of labour could be changed according to changes in production force of labour (1), qualification of objective labour (2), investment in building qualification (3), market earnings (4), and organizational costs of labour (5).

(1) The change in production force of labour is manifested in the form of changed objective labour on unit of product, which, in essence, shows the change in productive capacity of this productive factor. It is primarily caused by new technique introduction as well as the changes in natural factors of the process of labour.

Having in mind the importance of *production forces* as a determinant both of economic efficiency of national business activities and living standards, it seems to be logical that an enterprise tends to continually grow up the rate of production forces in its strategy of growth and development. This is a condition for raising its economy.

If the change in objective labour affected by the change in production force of labour is labeled as Kl_1 , it will cause a change in economy ($E_{II}tl_1$), which can be expressed as

$$E_{II}tl_1 = \frac{1}{1 \pm Tl_1tk}, \text{ where}$$

$$Tl_1tk = \frac{TI(1 \pm Ktl_1) - 1}{T(1 \pm Kq)}$$

and Tl_1tk means the change in labour costs on unit of total costs affected by the changes in production force of labour.

If the upper influence of production force of labour on labour costs in the expression of economy is projected through revenue, or, precisely, through change in revenue affected by the dynamics of production force of labour ($Kc(l_1)$), and assuming that the other factors of revenue are constant, the realized effect on economy could be expressed as

$$E_{II}tl_1 = \frac{C(1 \pm Kc(l_1))}{T(1 \pm Kttl_1)} - 1,$$

where $Kttl_1$ is the coefficient of changes in reproduction costs based on the changed labour costs which are affected by the dynamics of production force of labour.

In the succession of periods, a new technique introduction and change in organizational structure cause a change in qualification structure of objective labour. Consequently, there is a process of differentiation in form of increasing complexity of objective labour for certain activities, on the one hand, and in form of increasing simplicity of objective labour for those activities with high level of technical and automatic support, on the other.

(2) The enterprise is motivated for *changes in qualification* of its employees and, especially, new potential workers, if they result in proportional growth of productivity of labour and, hence, in enhancing economy. In that sense, if such change in objective labour is labeled as Kl_2 , and the change in labour costs as Ktl_2 , the new expression of economy will be

$$E_{\Pi}tl_2 = \frac{1}{1 \pm Tl_2tk}, \text{ where}$$

$$Tl_2tk = \frac{Tl(1 \pm Ktl_2)}{T(1 \pm Kq)} - 1, \text{ or}$$

$$Ketl_2 = \frac{C(1 \pm Kc(l_2))}{T(1 \pm Kttl_2)} - 1.$$

(3) Certain changes in labour costs and, hence, in economy could be affected by the costs (investments) of building qualification. These investments are necessary due to continual innovation and technical progress development. They are mostly related to growing up the qualification of employees, but also include new investments in education system.

If labour costs on this basis are labeled as Tl_3 , the economy in dynamics will be

$$E_{\Pi}tl_3 = \frac{1}{1 \pm Tl_3tk}, \text{ where}$$

$$Tl_3tk = \frac{Tl(1 \pm Ktl_3)}{T(1 \pm Kq)} - 1, \text{ or}$$

$$Ketl_3 = \frac{C(1 \pm Kc(l_3))}{T(1 \pm Kttl_3)} - 1,$$

where Tl_3tk denotes the change in labour costs (on unit of total costs) affected by the dynamics of costs of building labour qualification.

Since the labour costs are the function of consumption of labour force and earnings per unit, it is logical that the earnings, as price of labour, could change in the succession of periods. Such changes are affected by mentioned changes in labour costs (especially caused by productive force of labour and changes in qualification of labour), but also by the other factors.

(4) If *earnings* is an economic category, it is formed as the valuable expression of consumptions of labour force as goods, according to the relation between supply and demand. This cause certain changes in labour costs (Tl_4) in the expression of economy, so

$$E_{\Pi}tl_4 = \frac{1}{1 \pm Tl_4tk}, \text{ where}$$

$$Tl_4tk = \frac{Tl(1 \pm Ktl_4)}{T(1 \pm Kq)} - 1, \text{ or}$$

$$Ketl_4 = \frac{C(1 \pm Kc(l_4))}{T(1 \pm Kttl_4)} - 1,$$

where Tl_4tk denotes the change in labour costs on unit of total costs affected by the changes in earnings per unit.

(5) Finally, in the succession of periods, *organizational labour costs* (tl) could also be changed either by the changes in consumptions of labour or certain changes in realized earnings compared with social accepted level. These labour costs (tl_{ii}) are important for expressing (a) and following realized economy (b).

In accordance with above mentioned claims, the expression of dynamics of economy based on the dynamics of labour costs will be

$$E_{\text{II}tl} = \frac{1}{1 \pm Tl_1tk \pm Tl_2tk \pm Tl_3tk \pm Tl_4tk} = \frac{1}{1 \pm Tltk}, \text{ that is}$$

$$Ketl = \frac{C(1 \pm Kc(l))}{T(1 \pm Kttl_1 \pm Kttl_2 \pm Kttl_3 \pm Kttl_4) - 1}.$$

Taking into account the organizational labour costs, it follows

$$E_{\text{II}tl} = \frac{1}{1 \pm Tl_1tk \pm Tl_2tk \pm Tl_3tk \pm Tl_4tk \pm tltk} = \frac{1}{1 \pm Tltk \pm tltk}.$$

The coefficient of economy's change (Ketl) could be obtain as $Ketl = Ketlc - Kettl$, where $Ketlc = Kc(l) / (1 \pm Kt)$ and $Kettl = Ktl / (1 \pm Kt)$.

3. THE CHARACTERISTICS OF INSTRUMENTS OF LABOUR COST IN DYNAMICS OF ECONOMY

Analyzing the basic characteristics of instruments of labour cost we can regularly conclude that they are the function both of their consumption and economic obsolescence. High level of technical progress in all fields of economic activities (especially in electronics, informatics etc.) affects the component of economic obsolescence costs to be larger than the component affected by physical consumption. Such appearance is affected on larger share of instruments of labour cost (amortization) in the total cost structure and their mainly fixed character.

The overall component of instruments of labour cost regularly includes maintenance costs.

Due to above mentioned characteristics, differentiating instruments of labour cost on the basis of their consumption (Tiu) and prices (Tic) is not so important as in the case of labour and material costs.

In the dynamics of reproduction, certain changes in technical factors mostly bring about a change in amortization costs. The changes in technical factors could be realized with the end of lifetime of the instruments of labour, but also before that period, if they are obsolete or erroneously chosen. From the standpoint of economy, the effects of such change should be projected both in relation to the objective costs of reproduction (a) and the level and dynamics of revenue (b).

(a) The change in objective instruments of labour cost brings about a change in economy, so we obtain

$$E_{\text{II}ti} = \frac{1}{1 \pm Ttik}, \text{ since}$$

$$Ttik = \frac{Ti(1 \pm Kti)}{T(1 \pm Kq) - 1},$$

where T_{tik} denotes the change in instruments of labour cost on unit of total costs affected by the dynamics of instruments of labour cost, projected in relation to the objective costs.

(b) In accordance with the concept and economic essence of economy, the effect of dynamics of amortization costs on the dynamics of economy should be also projected in relation to the result expressed through value, or revenue, assuming that the other factors of revenue are constant. There are two possibilities: (1) revenue is not changed in relation to the initial period, and (2) revenue is changed simultaneously with the changes in instruments of labour cost.

When revenue is not changed, the effect of those influence, measured by the economy expression, will be

$$E_{\Pi ti} = \frac{C}{T(1 \pm K_{tti})}$$

If there are simultaneous changes in revenue, we obtain

$$E_{\Pi ti_c} = \frac{C(1 \pm K_c(i))}{T(1 \pm K_{tti})}, \text{ when}$$

$$K_{eti_c} = \frac{1 \pm K_c(i)}{1 \pm K_{tti}} - 1,$$

where K_{tti} is the coefficient of change in reproduction costs affected by the dynamics of instruments of labour cost: $K_{tti} = dT_i / T_i$, or indirectly: $K_{tti} = T_i(1 \pm K_{tti}) / T(1 \pm K_t) - 1$, and $K_c(i)$ is the coefficient of change in revenue affected by the dynamics of instruments of labour cost: $K_c(i) = (dT_i/dT) \times K_c$.

It is important to differentiate the rate of economy on a part affected by the dynamics of revenue (K_{ec}), and a part affected by the dynamics of instruments of labour cost (K_{eti}). In the first case, the rate of economy affected by the dynamics of revenue could be obtain as

$$K_{ec} = \frac{K_c(i)}{T(1 \pm K_t)},$$

when the rate of economy affected by the dynamics of instruments of labour costs will be

$$K_{eti} = \frac{K_{tti}}{1 \pm K_t}$$

Finally, taking into consideration their importance, it is useful to project coefficient of parameter elasticity of economy which is realized for a discrete value set (E_d). In that sense, we should express the change in economy affected by some changes in revenue and/or in costs for 1%. Such expression of economy, as it is well known, is

$$E_{\Pi d} = \frac{C^{ac}}{T^{at}}, (d = 1 \dots dn).$$

The coefficients of elasticity, for indicated conditions, could be obtain as: $ac = K_{ec}/K_c(i)$, and $ati = K_{eti}/K_{tti}$.¹

4. THE MATERIAL COSTS IN DYNAMICS OF ECONOMY

The changes in technical, natural, and social factors regularly affect certain changes in material costs. In relation to the unit objective costs in initial period, the material costs could increase or reduce, which influence the level of economy. If there is a simultaneous change in the volume of product, the following expression of economy affected by the dynamics of material costs and projected in relation to the initiate state (objective costs) will be

$$E_{\Pi tm} = \frac{1}{1 \pm T_{tmk}}, \text{ where}$$

$$T_{tmk} = \frac{T_m(1 \pm K_{tm}}{T(1 \pm K_q)} - 1).$$

Since the material costs in their quantitative expression are the function of consumption and unit price ($T_m = U_m \times C_{um}$), the mentioned changes could be influenced by changes in consumption, price or both consumption and price. It follows: $T_{tmk} = T_{mutk} \pm T_{mctk}$. In accordance with the information on kinds of material consumptions (m_1, m_2, \dots, m_n) and their prices (cm_1, cm_2, \dots, cm_n), we can differentiate the cited components of material costs as well as their changes in dynamics. It is necessary to project the changes in economy on the same basis.

¹ If

Label	I	II	d	K	K/label
Q	10	12	2	0,20	Kq
C	20	28	8	0,40	Kc
T	10	12	2	0,20	Kt
Ti	4	5	1	0,25	Kti
Tm	5	5,8	0,8	0,16	Ktm
Tl	1	1,2	0,2	0,20	Ktl
E	2,00	2,33	0,33	0,167	Ke
				0,333	Kec
				0,167	Ket

it follows:

$$T_{itk} = \frac{4(1+0,25)}{10(1+0,20)} - 1 = 0,0167;$$

$$E_{\Pi ti} = 1/(1+0,0167) = 0,9836;$$

$$K_{eti} = 0,9836/1,00 - 1,00 = 0,0164/1,00 = -1,64\%;$$

$$E_{\Pi ti_c} = 20(1+0,20)/10(1+0,1) = 2,1818;$$

$$K_c(i) = 1/2 \times 0,40 = 0,20;$$

$$K_{ti_c} = [(1+0,2)/(1+0,1)] - 1 = 0,0909;$$

$$K_{ec} = 0,2/1,2 = 0,1667; \quad K_{eti} = 0,1/1,2 = 0,0833;$$

$$ac = 0,1667/0,2 = 0,833; \quad ati = 0,0833/0,1 = 0,833.$$

The conclusion is following: if revenue increases 40,0%, economy enhances 16,67%; each increasing costs of reproduction affected by enhancing instruments of labour costs affects reducing economy for 8,3%, so the total effect is in enhancing economy for 8,4%. In other words, projected on unit, it follows that each change of revenue or costs for 1% effects, in given conditions, the change in economy for 0,833%

If, however, the change in economy affected by the change in material costs is projected in relation to revenue, it follows

$$E_{\Pi tm} = \frac{C(m)}{T(1 \pm K_{ttm})}.$$

And, if there are a simultaneous change in revenue, the expression of economy will be

$$E_{\Pi tm_c} = \frac{C(1 + K_c(m))}{T(1 \pm K_{ttm})}, \text{ since}$$

$$K_{etm_c} = \frac{1 + K_c(m)}{1 \pm K_{ttm}} - 1,$$

where K_{ttm} is the coefficient of change in costs of reproduction affected by the changes in material costs: $K_{ttm} = dT_m / T_i$, and $K_c(m)$ is the coefficient of change in revenue affected by the dynamics of material costs: $K_c(m) = (dT_m / dT) \times K_c$.

The effect of change in economy is necessary to differentiate: first, on the basic elements - in relation to the changes in revenue and material costs, and, second, in relation to the changes in consumption and price of materials. Understandably, it is possible to make further differentiation on the basic kinds of material, as we mentioned above.

Accordingly, with the change in revenue and material costs, it follows: $K_{etm} = K_{ec} + K_{etm}$, when $K_{ec} = K_c(m) / (1 \pm K_t)$, and $K_{etm} = K_{ttm} / (1 \pm K_t)$.²

If the change in material costs are differentiated on a part affected by the change in consumption and a part affected by the change in price, it follows: $K_{etm} = K_{etmu} \pm K_{etmc}$, where

$$K_{etmu} = \frac{1}{1 \pm K_{ttmu}}, \text{ and}$$

$$K_{etmc} = \frac{1}{1 \pm K_{ttmc}}.$$

In addition, we should express: $K_{ttm} = K_{ttmu} \pm K_{ttmc}$; $K_{ttmu} = dT_{mu} /$, and $K_{ttmc} = dT_{mc} / T_i$.

² Using the elements from previous example, it follows:

$$T_{mtk} = \frac{5(1+0,16)}{10(1+0,20)} - 1 = -0,0165;$$

$$K_{etm} = 1 / (1 - 0,0165) = +1,68\%;$$

$$E_{\Pi tm_c} = \frac{20(1+0,16)}{10(1+0,08)} = 2,148;$$

$$K_{etm_c} = \frac{1+0,16}{1+0,08} - 1 = 0,074; \quad K_{etm_c} = E_{\Pi tm_c} / E_{\Pi} - 1 = (2,148 / 2,0) - 1 = 0,074;$$

$$K_{ec} = 0,16 / (1+0,20) = 0,133;$$

$$K_{etm} = 0,08 / (1+0,20) = 0,067;$$

$$ac = 0,133 / 0,16 = 0,83;$$

$$atm = 0,067 / 0,08 = 0,83.$$

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KARAKTERISTIKE TROŠKOVA PROIZVODNIH FAKTORA U DINAMICI EKONOMIČNOSTI PREDUZEĆA

Dragiša Grozdanović

Polazeći od činjenice da troškovi proizvodnih faktora obuhvataju troškove rada, troškove sredstava za rad i troškove predmeta rada, u radu se analiziraju osnovne karakteristike dinamike troškova svakog proizvodnog faktora i efekte njihovog uticaja na dinamiku ekonomičnosti preduzeća.