THE SYNTHETICAL ANALYSIS OF REFLECTING THE LABOUR PRODUCTIVITY INTO THE MASS OF PROFIT

Căruntu Constantin
Universitatea "Constantin Brâncuşi", Facultatea de Ştiinţe Economice
Strada Victoriei, nr. 24, Tg-Jiu, Gorj, e-mail: caruntu_ctin@yahoo.com
Lăpăduşi Mihaela Loredana
Universitatea "Constantin Brâncuşi", Facultatea de Ştiinţe Economice
Strada Victoriei, nr. 24, Tg-Jiu, Gorj, e-mail: loredana@utgjiu.ro

The labour productivity is one of the most important indicator for analyzing a company activity and it has always been the target of the attempts to permanently increase the profit and its results. The increase of labour productivity represents also the most important factor to increase the volume of production, to decrease the production costs and to increase the products' rentability and competitiveness both on internal and external markets. Reflecting the labour productivity into the mass of profit is connected to the grasping of its contents and significance, of the priority of influential factors and the way of capitalization. The key of labour efficiency as a production factor is given in essence by the relation between the dynamics of its output (labour productivity) and the dynamics of average wages whereas the condition of this efficiency is that the dynamics of labour productivity should outrun the average wages.

Key words: profit, labour productivity, average wages, wages expense.

JEL Classification: D24 – production, cost, capital and total factor productivity, capacity.

Labour productivity is equalized to profit, which is in essence symetrical to its volume. Consequently we may speak about a conversion of output at the level of product or of the entire production obtained or sold (physical and value output). Also labour productivity represents the efficiency of consumed labour and at the same time the efficiency of human potential to generate profit both at the level of product as well as at the level of the entire production.[89] At the level of product, the quantifying methodology of reflecting the output of labour we rekon to be the following:

$$Ts_1 \cdot \left(\overline{whs}_1 - \overline{whs}_0 \right) \cdot \overline{pr}_0 \quad sau \quad \left(qv_1 \cdot ts_1 \right) \cdot \left(\overline{whs}_1 - \overline{whs}_0 \right) \cdot \overline{pr}_0$$

$$T_1 \cdot \left(\overline{wh}_1 - \overline{wh}_0 \right) \cdot \overline{pr}_0 \quad sau \quad \left(qv_1 \cdot t_1 \right) \cdot \left(\overline{wh}_1 - \overline{wh}_0 \right) \cdot \overline{pr}_0$$

where:

Ts – standard time of work per product;
ts - standard time of work per product;
$\overline{whs}$ – the value of production per standard unit of time;
$\overline{pr}$ – average profit per 1 leu production;
qv – sold production;
T – total working time;
$\overline{wh}$ – average productivity per hour;
t – working time per unit of product.

Regarding the profit per unit of product, the labour output (physical productivity) can be emphasized through time economizer, respectively:

$$-\left(t_1 - t_0 \right) \cdot \overline{wh}_0 \cdot pr_0$$

89Alexandru Buglea, Analiză economico-financiară, Universitatea de Vest, Timişoara, 2008.

$$-(t_1 - t_0) \cdot \frac{P_0}{t_0}$$

where:

t – time of labour per unit of product;

$\dfrac{P}{t}$ – profit per unit of time.

To exemplify the following data can be used:

Table no.1

Product	Physical volume		Standard time per unit of product (hours)		Total standard time		Value volume (lei)	
	P_{n-1}	Pn	P_{n-1}	Pn	P_{n-1}	Pn	P_{n-1}	Pn
A	2.000	2.200	100	100	200.000	220.000	20.000.000	26.640.000

Average production per standard unit of time (lei)		Profit per 1 leu production		Sum of profit per product (lei)		Deviation of the profit sum
P_{n-1}	Pn	P_{n-1}	Pn	P_{n-1}	Pn	(lei)
100	120	0,10	0,12	2.000.000	3.196.800	1.196.800

The influence of the output (labour productivity) based on the data in the above table is accomplished as it follows:

1.based on the value productivity per standard unit of time (at the level of product):

$Ts_1 \cdot \left(\overline{whs_1} - \overline{whs_0} \right) \cdot \overline{pr_0} = 220.000$ x (120 - 100) x 0,10= + 440.000 lei

2.based on physical productivity of labour per unit of product and per product where the following data may be used:

Table no. 2

Physical volume of the product		Working time per unit of product		Working time per product		Average value production per unti of time		Profit per product (thousands of lei)		Profit per unit of product	
P_{n-1}	Pn	P_{n-1}	Pn	P_{n-1}	Pn	P_{n-1}	Pn	P_{n-1}	Pn	P_{n-1}	Pn
2.000	2.200	100	85	200.000	187.000	10.000	14.246	2.000.000	3.196.800	1000	1.453,1

Per unit of product, it means that the output is reflected into the profit (profit per unit of product) with:

$$-\left[(t_1 - t_0) \cdot \overline{wh_0} \cdot \overline{pr_0} \right] = -\left[(85 - 100) \cdot 100 \cdot 0,10 \right] = +150 \ lei$$

or

$$-(t_1 - t_0) \cdot \frac{P_0}{t_0} = -(85 - 100) \cdot \frac{1.000}{100} = +150 \ lei$$

At the scale of the entire volume of production obtained and sold (in order not to complicate things further with correction of production obtained with increasing and decreasing of stocks of finite products and of course their amounting in prices of selling) it means that altering the profit per unit of product, the physical volume of product is magnified with the physical volume of product in P_n. The relations comprising the variables would be written as it follows:

110

$$-\left[qv_1 \cdot (t_1 - t_0) \cdot \overline{wh}_0 \cdot \overline{pr}_0\right] = -\left[2.200 \cdot (85 - 100) \cdot 100 \cdot 0,10\right] = +330.000 \; lei$$

or

$$\left(qv_1 \cdot (t_1 - t_0) \cdot \frac{P_0}{t_0}\right) = -\left(2.200 \cdot (85 - 100) \cdot \frac{1.000}{100}\right) = +330.000 \; lei$$

Thus out of deviating the profit per product A of 1.196.800 lei, 330.000 (that is approximately 28%) represents the effect of the output increase of the labour factor. Based on value productivity, the labour output is reflected in the prefit per product with:

$$Ts_1 \cdot \left(\overline{whs}_1 - \overline{whs}_0\right) \cdot \overline{pr}_0 = 187.000 \cdot (142,46 - 100) \times 0,10 = 187.000 \cdot 42,46 \cdot 0,10 = +794.002 \; lei$$

$$\left(qv_1 \cdot ts_1\right) \cdot \left(\overline{whs}_1 - \overline{whs}_0\right) \cdot \overline{pr}_0 = 2.200 \cdot 85 \cdot (142,46 - 100) \times 0,10 = 2.200 \cdot 85 \cdot 42,46 \times 0,10 = +794.002 \; lei$$

Under these circumstances, in order to accomplish the connection between the real output and the profit, in the extent that the productivity in comparable prices has not been taken into account, it is necessary that the influence of inflation should be eliminated. This means that the effective productivity would be equal with:

$$\frac{qv_1 \cdot \overline{p}_0 \cdot Ip}{T_1}$$

where: Ip – indices of prices.
Accepting the hypothesis that Ip = 1,10, the value productivity od labour per unit of time in P_n would be equal with:

$$\frac{qv_1 \cdot \overline{p}_0 \cdot Ip}{T_1} = \frac{[(2.200 \cdot 10.000) \cdot 1,10]}{187.000} = 129,41 \; lei$$

Under these conditions, the real output of labour is reflected into the profit per product with:

$$\left(qv_1 \cdot t_1\right) \cdot \left(\overline{wh}_1 - \overline{wh}_0\right) \cdot \overline{pr}_0 = 2.200 \cdot 85 \cdot (129,41 - 100) \cdot 0,10 = 2.200 \cdot 85 \cdot 29,41 \cdot 0,10 = +549.967 \; lei$$

As it has been observed before, the different results of the calculi are not subject of an estimation, the aim of the paper being that of demonstrating the mechanism and methodology, the conversion of volume into profit and utilizing the production factors – with circumscribing to labour and capital.
Exemplifying the conversion of the output through the agency of fixed expenses for 1 leu or 1 thousand lei production may be accomplished utilizing the following data:

Table no.3

Nr. crt.	Indicator	P_{n-1}	P_n
1.	Turnover - CA	23.148.000	28.800.000
2.	Fixed expenses - Cf	2.500.000	-
3.	Average productivity per hour - $\overline{wh}$	11.603	15.008
4.	Total working time – hours	1.995.000	1.919.000
5.	Indices of prices - Ip	1,10	-

For this the relation

$$-\left(\frac{Cf_0}{\frac{1}{1000} \cdot \left(T_1 \cdot \overline{wh}_1\right)} - \frac{Cf_0}{\frac{1}{1000} \cdot \left(T_1 \cdot \overline{wh}_0\right)}\right) \cdot CA_1 = -\left(\frac{2.500.000}{\frac{1}{1000} \cdot (1.919.000 \cdot 15.008)} - \frac{2.500.000}{\frac{1}{1000} \cdot (1.919.000 \cdot 11.603)}\right) \cdot 28.800.000 =$$

$$= -\left(\frac{2.500.000}{28.800.352} - \frac{2.500.000}{22.266.157}\right) \cdot 28.800.000 = -(0,0868 - 0,1123) \cdot 28.800.000 = +734.400 \; lei$$

is used or eliminating the effect of inflation:

$$-\left(\frac{Cf_0}{\frac{1}{1000}\cdot\left(T_1\cdot\overline{wh_1}\right)-\alpha}-\frac{Cf_0}{\frac{1}{1000}\cdot\left(T_1\cdot\overline{wh_0}\right)}\right)\cdot CA_1=$$

$$=-\left[\left(\frac{2.500.000}{\frac{1}{1000}\cdot(1.919.000\cdot15.008)-1,739}\right)-\left(\frac{2.500.000}{\frac{1}{1000}\cdot(1.919.000\cdot11.603)}\right)\right]\cdot28.800.000=$$

$$=-\left[\left(\frac{2.500.000}{28.800.350,26}\right)-\left(\frac{2.500.000}{22.266.157}\right)\right]\cdot28.800.000=-\left(0,0868-0,1123\right)\cdot28.800.000=+734.400\ lei$$

where:

$$\alpha=\frac{\sum qv_1\cdot\overline{p_1}}{T_1}-\frac{\sum qv_1\cdot\overline{p_0}\cdot Ip}{T_1}=$$

$$=\frac{28.800.000}{1.919.000}-\frac{23.148.000\cdot1,10}{1.919.000}=15,008-13,269=+1,739\quad lei$$

The labour efficiency as a production factor is based in essence on the connection between the dynamics of its output (labour productivity) and the dynamics of the average wages. As it is known, the requirement is that the dynamics of the output should outrun the dynamics of the average wages. This is the case of the dynamics of the real output in the sense of elimination the effect of inflation and the structure of production. Similarly the problem of comparing the average wages intervenes.[90] With the correlation in the above agreement is operated at the level of exercise production, of the turnover or the added value, depending on the way the output of the labour factor is established.

It is a frequent practice that in the specialised literature the labour productivity be used, established on the turnover per employee or unit of time. It is certain that as any other value indices the labour output is not beyond the incidence of inflation and of production structure. The correlation between the dynamics of output (the labour productivity) and the dynamics of average salary is reflected through the agency of the corelation indices established through 2 modalities[91]:

$$I_c=\frac{I_{\overline{s}}}{I_{\overline{w}}}\quad si\quad I_c=\frac{I_{\overline{s-1}}}{I_{\overline{w-1}}}$$

where:
Ic – the indices of the correlation;
Is – the indices of average wages;
Iw – the indices of labour productivity.

The requirement due to which the dynamics of the labour productivity outruns the dynamics of the average wages, is emphasized by the inequity: $I_c<1$ (the conditions taken into consideration before are reminded). As it is known nobody has establishe the optimum opening of the correlation, the contractual indices of correlation which cannot be a standard, but a conditioned aptitude (the social variable includeed).

To exemplify we admit the following situation:

---

90 Lucian Buşe, Analiză economico-financiară, Economică, Bucureşti, 2005.
91 Căruntu Constantin, Lăpăduşi Mihaela, Căruntu Genu, Analiză economico-financiară la nivel microeconomic, Universitaria, Craiova.

Indicatori	P_{n-1}	P_n	$\dfrac{P_n}{P_{n-1}}$	I_c
1.The labour output for an employee (labour productivity) - lei				
a) based on the production exercise	20.571.500	2.633.152	1,28	x
b) on the turnover	18.600.000	23.436.000	1,26	x
c) on the added value	9.257.175	12.112.500	1,31	x
2. The average annual wages - lei	7.200.000	8.640.000	1,20	x
3. The indices of the correlation judging after the two modalities:				
a)based on average production of the exercise per employee	x	x	x	$\dfrac{0,938}{0,714}$
b) on the average turnover per employee		x	x	$\dfrac{0,952}{0,769}$
c)on the average value added per employee	x	x	x	$\dfrac{0,916}{0,645}$
4. Expenses on wages for 1000 lei				
a) the production exercise	350	328	93,71	x
b) turnover	387	369	95,35	x
c) added value	778	713	91,68	x

First the following situation appear, where $I_c < 1$, irrespective on what grounds labour productivity is established and on which modalities the indices of the correlation is established. In other words, it means the dynamics of the labour productivity deviated the dynamics of average wages, and the effect within the decreasing of wages expenses at 1000 lei production of exercise, turnover or added value and consequently in increasing of profit and evidently of rentability rates.

If we exemplified the situation taking into consideration the expenses at 1000 lei turnover, it would result that the labour output (labour productivity) through the effect of the correlation is reflected in altering the wages expenses with – 18 lei thus:

1.The influence of the labour output (labour productivity):

$$\left(\frac{\overline{Sm_0}}{\overline{W}_1} - \frac{\overline{Sm_0}}{\overline{W}_0}\right) \cdot 1.000 = \left(\frac{7.200.000}{23.436.000} - \frac{7.200.000}{18.600.000}\right) \cdot 2000 = -79,50 \quad lei$$

or

$$\frac{Cs_0^{(1000)}}{I_{\overline{w}}} - Cs_0^{(1000)} = \frac{387}{1,26} - 387 = -79,50 \quad lei$$

where:

$Cs^{(1000)}$ – wages expenses at 1000 lei turnover;

$I_{\overline{w}}$ - the indices of labour productivity in this case established on the basis of the turnover.

or

$$Cs_1^{(1000)} - \frac{Cs_1^{(1000)}}{I_{\overline{w}}} = 369 - \frac{387}{1,26} = +61,50 \quad lei$$

Consequently, it follows that the effect of the labour output (labour productivity) compensates the influence

of average wages increase and furthermore it contributes to the reduction of wages expenses at 1000 lei turnover with 18 lei, and implicitly to the increase of profit at 1000 lei turnover. Taken into consideration separately, it denotes that the dynamics of the output (labour productivity) competed at reduction of wages expenses at 1000 lei turnover with 79,50 and corresponding to the increase of profit at 1000 lei turnover having the same value. Transformed into calculus relations, it means that the labour output through its effect on the correlation, led to the increase of the mass profit afferent to the turnover with:

$$-\left[\left(\frac{\overline{Sm_0}}{\overline{\overline{W_1}}}-\frac{\overline{Sm_0}}{\overline{\overline{W_0}}}\right)\cdot 1000\right]\cdot\frac{CA_1}{1000}=-\left[\left(\frac{7.200}{23.436}-\frac{7.200}{18.600}\right)\right]\cdot 1000\cdot\frac{18.748,8}{1.000}=$$

$$=-\left[(0,307-0,387)\cdot 1000\right]\cdot 18,7488=+1.499,904\ lei$$

respectively

$$-(\frac{Cs_0^{(1000)}}{I_{\overline{w}}}-Cs_0^{(1000)})\cdot\frac{CA_1}{1.000}=-(\frac{387}{1,26}-387)\cdot\frac{18.748,8}{1.000}=$$

$$-(307,143-387)\cdot 18,7488=-\left[(-79,857)\cdot 18,7488\right]=+1.499,904\quad lei$$

Note: CA1- respectively the turnover in Pn = 18.748,8 lei

In case the influence of average wages were introduced for the integrating image of the correlation effect, then it would result from the following:

$$-\left(\frac{\overline{Sm_1}-\overline{Sm_0}}{\overline{\overline{W_1}}}\cdot 1.000\right)\cdot\frac{CA_1}{1.000}=-\left(\frac{9.000-7.200}{23.436}\cdot 1.000\right)\cdot\frac{19.748,8}{1.000}=$$

$$=-\left(\frac{1.800}{23.436}\cdot 1.000\right)\cdot 19,7488=-\left(0,0768\cdot 1.000\right)\cdot 19,7488=76,8\cdot 19,7488=-1.516,7078\quad lei$$

or

$$-\left(Cs_1^{(1000)}-\frac{Cs_0^{(1000)}}{I_{\overline{w}}}\right)\cdot\frac{CA_1}{1.000}=-\left(369-\frac{387}{1,26}\right)\cdot\frac{18.748,8}{1.000}=-\left(369-307,143\right)\cdot 18,7488=$$

$$=-61,857\cdot 18,7488=-1.153.051.000\quad lei$$

Therefore in its unity, the correlation between the dynamics of labour (labour productivity) and the average wages lead to the increase of the profit afferent to the turnover with:

$+1.499,904-\left(-1.516,7078\right)=+3.016,6118\ lei$

Bibliography

1.Anamaria Ciobanu, *Analiza performanţei întreprinderii*, ASE, Bucureşti, 2006;

2.Dan Dumitru Popescu, Creating value through company analysis, H'ART Publishing Science, Bucharest, 2007;

3.Dorina (Lezeu) Popa, *Analiză economico-financiară : elemente teoretice şi aplicaţii practice,* Universitatea din Oradea, Oradea, 2006;

4.Dumitru Mărgulescu, Constantin Căruntu, *Analiza economico-financiară a întreprinderii,* Hermes, Bucureşti, 1999;

5.Ion Anghel, Eduard Dinu, *Strategia şi analiza economico – financiară a firmei*, ASE, Bucureşti, 2007

6.Ion Cucui, *Costurile şi importanţa lor în controlul gestiunii firmei*, ARVES, Craiova, 2008;

7.Mariana Elena Bălu, *Analiza economico – financiară. Teorie şi aplicaţii practice*, Ed. Fundaţia „România de mâine", Bucureşti, 2008;

8.Nicolae Mihăilescu, Mihaela Răducan, *Analiza activităţii economico – financiare*,Victor, Bucureşti, 2006.