Possibilities and limits of valuing labor productivity in agriculture

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ABSTRACT
As a process that can be measured, labor productivity is important both as level and dynamics, the latter being expressed as absolute and relative spore. This paper reveals the concerns for labor productivity determination based on the method of effective costs of labor, method inspired by the question: "How much labor uses the agricultural producer (individual or collective) to produce goods for consumption?"The reasoning of this method has as basic elements salary cost and direct intermediate consumptions, with the aim of determining the indicator "full productivity of labor".

***Key words**: full productivity, intermediate consumption, salary price, potential labor*

1. Impact of labor productivity on the functioning of the economic mechanism in agriculture

Analysis of changes in labor productivity in terms of its effects on the processes of formation and distribution of agricultural income and the capitalization of this branch reveals: the existence of relations system of "feed-back", closely related to the efficiency of work (Fig. 1), so it is that as the driving force, labor productivity, although it is an economic category, belonging to the sphere of production, connects itself to the distribution process, especially in the case of agriculture, as primary branch, whose productivity depended and depends on the expansion of non-agricultural sectors.

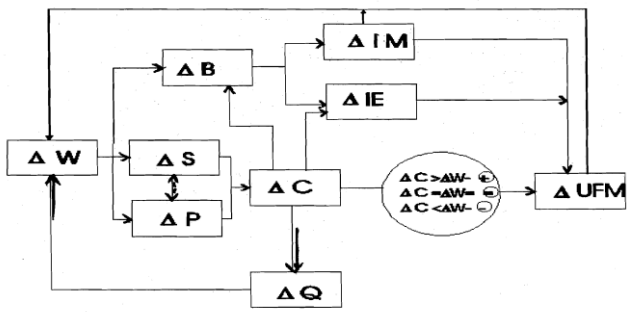

Fig.1. Impact of labor productivity on the functioning of the economic mechanism in agriculture

W = labor productivity, S = salaries, p = prices (real), B = profit, IM = investments for production modernization, IF = investments for production extension, C = demand of agricultural products, UMF = labor utilization, Q = production, Δ = indicators variation, --> = explicit relationships,= = > = implicit relationships,<---> = interconnected relationships
Implicit or explicit nature of the relationship between labor productivity and the various elements of the economic mechanism in agriculture has certain relativity, each variable having its multiple determinations.

2 The effective expenditure of labor method

Using the concept of "effective labor expenditure" is inspired by the following question: how much work consumes agricultural producer (individual or collective) to produce goods for consumption? The answer can only reflect the finding that every farmer must submit, ultimately, an effort to make possible remuneration of labor and material resources necessary to achieve, through various combinations, productive objectives. As long as the monetary equivalent of this effort, be it at the level of one hour of work, is a salary price, one can take into account the idea of measuring with the help of all consumption caused by the production process. In fact, what the farmer is interested in is the efficiency with which his efforts are reflected in output obtained, either directly (through the labor process) and indirectly (through material means that it mobilizes). Of course, the work is important in terms of performance of material resources it delivers, but at the farm level it must be analyzed in equivalent work effort to get those material means without the agricultural products can not be obtained.

In a first conclusion, if the issue is to convert the materialized work in means of production, through a converter represented by physical and mental skills of farmer, the yield would be given by:

$$equivalentinpotentiallabor^{*} = \frac{pricesofmaterialfactorsofproduction}{Salarialpriceperhour}$$

*expressed in number hours-worker

In other words, extending the application of judgment in assessing the use of labor for agricultural production, we can associate to any resource or service, a multiple of salary price per hour, respectively a certain number of hours-worker: for example, the price to be paid for a tractor is “X” times higher than the salary per hour of a farmer “A”, “Z” times higher than the salary per hour of farmer “B” etc. As a result, the need of work is “X” hours, respectively, “Z” hours. Whether hourly wage, due to the influence of the labor market, the level of social labor individual productivity, interprofessional relations, measured more or less correctly the effort of one hour of work, the reported above equivalence is intrinsic to economic mechanism, or the importance of labor productivity derives from the role that it has to adjust the economic mechanism and not one "abstract" or "absolute" mechanism.

The considerations set, which justifies the use of wage price (or real price) and, thus, enables the measurement in labor units of all materialized consumption embodied in agricultural production, put the method of effective expenditure of labor in the light of a reasoning respecting, in greater extent, the content of the concept of labor productivity expressed in this case by "full productivity of labor."

The main restrictions imposed by effective expenditure of labor method are related to the distribution of indirect inputs – labor consumption, intermediate consumption, capital services and services provided by third parties - on the different products and aggregate productivity corresponding to different products to obtain an acceptable information for the work efficiency for a group of products of agricultural activity on the farm or agricultural branch.

We believe that, depending on the farm’s profile and specialization, the base of allocating indirect consumption may differ. What is important is how far the objective of locating the product consumption as close to reality is achieved. Such reporting may be based, taking into account its active role in the agricultural production, the direct intermediate consumption.

Regarding the measurement of labor productivity by product, farms and so on, as the aggregation is performed at higher levels, the ability of synthesis expressed by the labor productivity decreases.

Moreover, as long as the same product, similar or substitutable, compete on the market, not farmers, farms - "actors" which can lose or gain from competition – the major interest should not happen for measurement labor productivity at higher structural levels of the products or groups of products, including agricultural products on the world market do not face, for example, Romanian agriculture to agriculture of other countries, but Romanian agricultural products to those similar from other countries.

Finally, any assessment of the contribution of agriculture to overall economic developments will include distortions inherent in any system of aggregation of information, even in the example below, the determination of labor productivity for five products (wheat, corn, barley, peas, milk) in wheat equivalent (based on the ratio of the price of other goods and the price of wheat) the share of productivity per product with coefficients of structure of total production in wheat equivalent. In comparison, aggregate information across agriculture, taking as a basis the weighting structure of turnover or gross and net value added, significantly reduce the "accuracy" of indicator: labor productivity.

The methodology of measuring labor productivity based on effective expenditure of labor implied the elaboration of a block diagram and a logical diagram of data processing, considering the particularities of agriculture imposes, in our approach, the following preliminary reasoning:

a. average wage price (per hour) will be a weighted average calculated on a while longer; in case of family labor, a net salary will be established by assimilating the salary of a worker in the area, working in the same conditions, or by a method of accounting;

b. agricultural land, as input, will be represented in the consumption of producing the rent actually paid by the agricultural producer (individual or collective) - if you come from farming, or by assimilating an average level of rent recorded in the respective zone – when it belongs to the own capital;

c. speaking about measurement of labor productivity per products, self-consumption is included in the input volume as equivalent work. For example, self-consumption of grain for livestock will be expressed on the basis of labor productivity in the equivalent hours-worker (by dividing the amount consumed in productivity that has been achieved). In this way, the influence of self-consumption on productivity at farm level is annihilated, as occurs once as effect - for cereal production - and twice as effort – for animal production;

d. capital services will be measured based on the discounted value, to meet the demands of reproduction. Direct capital services will be expressed first as time (usually in hours) based on the daily sheet of using machine, equipment, installation etc., then it will multiply the hourly depreciation, fixed with updated inventory value and service life measured in "hours";

e. in relation to debates on whether or not to include financial expenditure in calculating labor productivity (incurred by services provided by third parties for which payment takes the form of interest on loans, insurance premiums, taxes collected by the state budget, etc.), we consider that it is necessary to include them in the efforts of obtaining the volume of agricultural production. Excluding them would distort labor productivity in product development and strategic default of agricultural production can be extended to an undue level, agricultural branches characterized by long cycles of the production process and, accordingly, slow movement of capital, or which "conflict" the mechanism of agricultural policy (through the fees, taxes, etc.).

f. secondary production will be equated in man-hours (secondary output value at recovery price / wage price), deducting, to ensure comparability between effect (physical production) and, effort, total consumption in equivalent work.

Calculation for labor productivity per product is exemplified on “barley”, whose price is “free” (compared to prices of wheat and corn), for other products: wheat, corn, peas and milk, we indicate only the data needed for obtaining the aggregate indicator of labor productivity on farm level (Table 1, 2).

Table 1

Resource consumption for obtaining the barley (wheat, corn, peas, milk) production

No.	Specification	Type of consumption	Quantity / price		Value (Thousand lei)	
			t_o	t_1	t_o	t1
1.	Labor (FM_{ij})	Direct (FMD_{ij})				
		Indirect (FMI_{ij})				
2.	Intermediate consumption (C_{ij})	Direct (CD_{ij})				
		Indirect (CI_{ij}				
	Of which: -fuel -fertilizers	Direct				
		Direct				
	-seeds	Direct				
	-water for irrigation	Direct				
	-other consumptions[1]	Direct				
		Indirect				
3.	Services of capital (updated) (Kij)	Direct				
		Indirect				
4.	Other services[2] (T_{ij})	Direct				
		Indirect				

5.	The balance of unfinished production(ΔPN_i)	Direct	-	-		

[1] including the rent related to cultivated area

[2] including banking services (interest for credits), assurance and services provided by state (for which, duties and taxes are paid etc.)

Table 2

Labor productivity per product and production obtained, expressed in wheat equivalent

N0.	Product	Labor productivity kg/hour-man		Production in wheat equivalent (To.)			
		t_o	t_1	t_o t			
				abs	%	abs	%
1.	Barley	4.34	4.22	486	14	540	12.5
2.	Wheat	4.15	3.8	715	20.5	700	16.3
3.	Corn	3.58	4	1406	40.4	1540	35.8
4.	Peas	2.5	1.8	206	5.9	240	5.6
5.	Milk	2.8	3.5	664.8	19.2	1277.5	29.8
	Total	3.587	3.716	3477.8	100	4297.5	100

$W_{i0} = 4.34 * 0.14 + 4.15 * 0.205 + 3.58 * 0.404 + 2.5 * 0.059 + 2.8 * 0.192 = 3.587$ Kg wheat / man-hour equivalent

$W_{i1} = 4.22 * 0.125 + 3.8 * 0.163 + 4 * 0.358 + 1.8 * 0.056 + 3.5 * 0.298 = 3.716$ Kg wheat / man-hour equivalent

CONCLUSIONS

We may conclude that the effective work expenses method has some limits, such as:

- the allocation of indirect product inputs, relying on direct intermediate consumption
- the aggregation of work productivity corresponding to different products
- the relevance of the indicator decreases of the as the aggregation level increases.

The fact the, on the market, the products are the ones that compete and not the actual farms that produce them, must not be omitted.

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