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## THE IMPACT OF SUBSIDIES ALLOCATION ON THE EFFICIENCY OF THE AGRICULTURAL SECTOR OF MOLDOVA

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**Abstract.** În această lucrare este prezentată evoluția alocării subvențiilor pentru sectorul agricol al Republicii Moldova și impactul acestora asupra producției agricole și profiturilor. În cadrul cercetării au fost utilizate date furnizate de către Biroul Național de Statistică al RM, Agenția de Plăți și Intervenții în Agricultură, precum și propriile investigații ale activității întreprinderilor agricole din Republica Moldova. Rezultatele demonstrează că chiar dacă pe parcursul ultimilor ani s-a majorat volumul subvențiilor, acesta este încă destul de mic. Cercetarea efectuată pe baza activității întreprinderilor agricole în perioada anilor 2007-2009 arată că numai 239 de întreprinderi au beneficiat de subvenții mai mari de 650 lei/ha, obținând un profit de 1522 lei/ha și un nivel al rentabilității de 29,6%. În scopul majorării eficienței subvențiilor alocate întreprinderilor agricole se propune selectarea lor în baza rezultatelor economico-financiare obținute prin metoda aprecierii.

**Cuvinte cheie:** Eficiență, Politică agricolă, Producători agricoli, Sector agricol, Subsidii.

### INTRODUCTION

One of the aims of the economy of the Republic of Moldova is to ensure adequate conditions for the stable development of agriculture, as the main branch of the national economy, which provides foodstuffs for the population and raw materials for the food processing industry. Its accomplishment is impossible without improving the regulation methods of the economy, including the subsidizing of agricultural producers. The aim of agricultural policies is to correct market imperfections, to promote the interests of this sector, of consumers or producers. In the developed countries the regulation of the agricultural sector is oriented toward supporting farmers' incomes and production prices, correcting the inefficiency which might arise because of the market conditions and promoting policies that might benefit consumers.

This paper examines the impact of subsidies allocation on the economic efficiency of the agricultural enterprises during 2007-2009 and proposes a method of subsidies allocation through the rating evaluation of enterprises in order to achieve a higher efficiency from using limited budget resources.

material and method

We used the collected data set from the official statistical reports registered in the period 2007-2009 by over 1600 corporate farms located in the Republic of Moldova. During the analysis of these 1600 corporate farms some of them dropped due to missing data or absence of production.

In the accomplished analysis we used various methods to evaluate the efficiency of allocated subsidies on profits and outputs (grouping method, regression analysis) and to evaluate the rating of selecting target enterprises that should benefit from subsidies.

### RESULTS AND DISCUSSIONS

For the Republic of Moldova, as for other countries in transition to market economy, the transformations from the 90's led to different problems concerning the changes in ownership relations, transition from a planned economy to market economy, adaptation of the agro-industrial complex components to the new market conditions, development of market infrastructure and investment processes etc. The agricultural policies promoted during the last decade followed some objectives, common for transition economies, being used a number of actions aimed at stopping the further degradation of the agri-food sector. The financial resources allocated from governmental budget were oriented to finance, mostly partially, some programs for supporting agricultural producers, subsidizing the production risks in agriculture, supporting the grape production and wine making sectors etc.

In Moldova the share of public expenditures on agriculture is low, in 2009 being equal to 4,7%.

Agricultural enterprises do not have enough resources to ensure their activity, many of them being

not profitable and the amount of investments in the sector being also low. Therefore, Moldova's agricultural sector requires a support from the government in order to become more attractive for investments, by this also contributing to the development of the sector, decrease of production expenses, and prices as well. One of the key elements of the governmental policy is state's support of the agricultural sector. The aim of subsidies allocation problem is to increase benefits from governmental support while bringing the related negative effects to a minimum, particularly in countries which are facing both low competitiveness of agricultural production and scarce accumulated capital that could be used for the reconstruction of the sector.

The agricultural sector is regulated by the National Strategy for Sustainable Development of the agro-industrial complex until 2015 (Monitorul oficial al RM, nr. 57-60, 2008), where the main strategic objectives of sustainable development of the agri-food sector are reflected: the insurance of a sustainable growth in the agricultural sector and improvement of living conditions in rural areas through the increase of competitiveness and productivity of the given sector. In 2007 the government implemented a new mechanism for subsidizing agricultural producers which was reflected in the Conception of subsidizing agricultural producers until 2015 (Monitorul oficial al RM, nr. 188-191, 2008), aimed at increasing the number of destinations of allocated subsidies.

In Moldova, the subsidizing fund of agricultural producers is administrated since 2010 by the Agency for Interventions and Payments in Agriculture, by this being increased the transparency of the allocated financial resources.

Despite the fact that the amount of subsidies increased, it is not enough to support the agricultural producers because the government have yearly debts in paying the demanded subsidies. From the total amount of subsidies distributed in 2010, about 60% of limited liability companies and 27% of agricultural farms benefited from it. Earlier, about 10 directions were subsidized, from which the largest share belonged to subsidizing of plant protection products and fertilizer users (about 40% in 2008, 16% - 2009).

Subsidies allocation in the agricultural sector aimed at supporting the agricultural producers and had a positive impact in increasing the amount of production and of its quality. The analysis carried in the table below shows the impact of allocated subsidies on the agricultural enterprises efficiency (Table 1):

Table 1

*The impact of the amount of the allocated subsidies on the indicators of economic efficiency of agricultural enterprises of the Republic of Moldova in 2007-2009*

Indicators	Groups according to the amount of subsidies per ha, lei						Total
	>50	50 - 200	200 - 350	350 - 500	500 - 650	>650	
Number of enterprises	98	282	216	153	111	239	1099
% from the total number	8,9	25	19	14	10	21	100
Area of agricultural land per 1 enterprise, ha	458	603	707	805	881	606	667
Subsidies per ha, lei	27	130	270	422	567	1109	453
Material costs per ha, lei	1 669	2049	2766	2481	3050	4190	2804
Retribution per worker, lei	9 344	8935	10064	10548	10689	12515	10693
Gross agricultural product per ha, lei	2 150	2182	2807	3010	3832	6273	3477
Profit per ha, lei	103	213	232	255	530	1522	518
Level of profitability, %	0,5	10,9	15,5	12	15,2	29,6	17,7

Source: author's investigations

The amount of allocated subsidies differs by groups, and the lowest amount belongs to the enterprises from the first group. For the next groups (from 50-650 lei per ha) the amount of allocated subsidies is higher, allowing them to obtain a profit up to 530 lei per ha. The efficiency of the allocated subsidies is more noticeable in the last group of enterprises which benefited from an amount upper than 650 lei per ha, allowing them to obtain better economic results (profit of 1522 lei per ha). This group also has the

highest level of profitability – 29,6%. Therefore, there is more efficient to allocate subsidies to the farms that are carrying out a stable economic and financial activity.

The results of the regression analysis in the previous study demonstrate that not all the subsidized directions are efficient. The highest impact on profits has the subsidizing of multiannual plantations establishment (0,79) and subsidizing of capital investments (0,5). Therefore, even having available limited financial resources there are possibilities for a better distribution of these resources (L. Cimpoieș, 2011).

The government had limited resources for subsidizing the agricultural producers. Therefore, in order to increase the efficiency of distributed subsidies it would be recommended to use a method of enterprises selection for subsidies allocation according to the results of their economical and financial situation.

Thus, in our opinion, the subsidies should be allocated to the enterprises with an average level of profitability between 10-30% that have a stable place on the market but which, because of some other reasons, face financial problems. For these enterprises, the rating evaluation should be analyzed according to their economical and financial conditions. According to accomplished investigations, in Moldova during 2009 out of 1417 enterprises 529 were unprofitable or about 40%. At the same time, a level of profitability higher than 30% was obtained by 299 agricultural enterprises, which belong to the target group of efficient farms. The group of profitability level between 10 and 30% included 291 enterprises. Our analysis, regarding rating evaluation according to enterprises' financial and economical indicators, will be focused on the last mentioned group. The analysis will include the results obtained by the agricultural enterprises in average during the years 2007-2009. The selected sample will include 234 enterprises that obtained a profitability level situated between 10 and 30%.

In order to compute the indicator of the rating evaluation it is necessary to compare the enterprises by each particular indicator with the enterprise model which has the best results by all the indicators.

Therefore, we will select the following indicators to analyze 234 agricultural enterprises:

- general profitability;
- profitability of agricultural production;
- profitability of fixed assets;
- return of farmland;
- return of material costs;
- return of fixed assets;
- labour productivity;
- gross profit per hectare.

The method of rating evaluation includes the set of primary data in a matrix form ( $a_{ij}$ ) in lines being included the numbers of indicators ( $i=1,2,3 \dots n$ ) and in columns – the enterprises codes ( $j=1,2,3 \dots m$ ).

For each indicator, we must find the maximal value which will be written in the column of the model indicator  $m+1$ . Then, the initial data of the matrix ( $a_{ij}$ ) is standardized related to the indicator of the model enterprise according to the next equation:

$$X_{ij} = \frac{a_{ij}}{\max a_{ij}}, \quad (1)$$

where,  $X_{ij}$  are the standardized indicators of the economical and financial situation of the enterprise  $j$ . At the end, for each analyzed enterprise, its rating is computed according to the next equation:

$$R_j = \sqrt{(1 - x_{1j})^2 + (1 - x_{2j})^2 + \dots + (1 - x_{ij})^2}, \quad (2)$$

where,  $R_j$  is the rating evaluation of the enterprise; and  $X_{1j}, X_{2j}, \dots, X_{ij}$  are the standardized indicators of the analyzed  $j$  enterprise.

The enterprises are classified in a descending order according to the rating evaluation. The highest rating will obtain the enterprise with the lowest comparative evaluation obtained by this equation.

The rating evaluation of the agricultural enterprises from Moldova was made according to the computed indicators based on the data from the enterprises specialized forms. In Moldova the number of unprofitable enterprises is high and the average level of profitability in the years 2007-2009 was of 17, 5% which denotes a low efficiency of agricultural production.

From all the analyzed enterprises, only one had a high level of profitability equal to 30,48%. A

profitability level of fixed assets less than 20% denotes a low efficiency of using the fixed assets, this fact being typical for 46% of the analyzed enterprises. At the same time, 30% of the analyzed enterprises have the level of fixed assets profitability less than 10%.

Table 2

*The indicators showing the level of profitability of the agricultural enterprises from Moldova in 2007-2009, %*

Code	General profitability level	Profitability level of the agricultural production	Profitability level of fixed assets
1473	10,06	9,83	9,52380952
733	10,39	10,53	19,6319018
527	10,48	10,03	18,1102362
530	10,57	11,17	55,8935361
671	10,58	10,88	23,1799163
488	10,61	10,09	11,0497238
224	10,66	10,79	1,63934426
84	10,68	13,45	15,3757225
1095	10,80	10,80	78,9640078
18	10,81	10,91	7,21514178
1052	10,90	12,24	29,5817163
129	10,98	13,73	16,1768358
...	....	....	.....
1613	30,48	29,31	12,87
<b>Total</b>	<b>17,57</b>	<b>16,04</b>	<b>12,8712871</b>
<b>Model enterprise (m+1)</b>	<b>30,48</b>	<b>111,2</b>	<b>644,7</b>

Table 3

*The indicators of economic efficiency of the agricultural enterprises from Moldova in 2007-2009, thousand lei*

Code	Return of farmland	Return of material costs	Return of fixed assets	Labor productivity	Gross profit per ha
1473	3,25339367	1,693757	34,238095	62,5217	0,226244
733	2,36860465	1,188448	4,1656442	32,592	0,360465
527	7,12903226	1,018433	1,160105	55,25	0,580645
530	3,01801802	1,164542	3,8212928	71,7857	0,312312
671	5,36127168	2,022901	1,5523013	57,9688	0,410405
488	3,77708333	1,588957	2,0033149	26,2754	0,39375
224	2,90228013	1,430177	1,8258197	111,375	0,355049
84	3,61054288	1,931397	5,3052023	33,0144	0,453186
1095	8,4	2,412162	0,1736381	59,5	0,494118
18	8,0828991	1,399984	0,5893344	93,7527	0,185694
1052	3,77950311	1,314728	1,5743855	40,1209	0,503106
129	5,68343279	2,746121	0,8278831	89,2857	0,290423
...	.....	.....	.....	.....	.....
1613	2,31210191	1,186275	3,5940594	90,75	0,649682
<b>Total</b>	<b>3,45615468</b>	<b>1,253916</b>	<b>0,6565703</b>	<b>46,2128</b>	<b>0,501259</b>
<b>Model enterprise (m+1)</b>	<b>17,94</b>	<b>4,16</b>	<b>34,86</b>	<b>288,6</b>	<b>2,74</b>

Based on the results from table 2 and 3, it was calculated the matrix of standardized coefficients of the analyzed enterprises' economical and financial activity. Thus, there was calculated the rating evaluation for each enterprise. The obtained results are presented in a descending order in the table below:

Table 4

*Rating evaluation of the agricultural enterprises from Moldova*

<b>Code</b>	<b>Rating</b>	<b>Code</b>	<b>Rating</b>
<b>1637</b>	2,530768201	<b>1108</b>	2,405227272
<b>231</b>	2,50112199	<b>733</b>	2,402921035
<b>900</b>	2,470806129	<b>933</b>	2,399199718
<b>1131</b>	2,469413896	<b>810</b>	2,397878141
<b>769</b>	2,460886254	<b>1106</b>	2,388750984
<b>788</b>	2,450901077	<b>980</b>	2,387260313
<b>1120</b>	2,450655107	.....	.....
<b>932</b>	2,448699766	<b>1556</b>	1,848008471
<b>787</b>	2,447119829	<b>754</b>	1,84794391
<b>218</b>	2,424619612	<b>867</b>	1,842259363
<b>87</b>	2,422496553	<b>375</b>	1,83876844
<b>708</b>	2,4188194	<b>412</b>	1,801805875
<b>722</b>	2,418141358	<b>1657</b>	1,758815015
<b>1184</b>	2,409441748	<b>1544</b>	1,754512722
<b>1147</b>	2,409120746	<b>103</b>	1,707053313
<b>386</b>	2,408288344	<b>1275</b>	1,662096607

The results of the obtained indicators determine the order of subsidies allocation from the state's budget to the agricultural enterprises in conditions when the financial resources are limited. Thus, the enterprises are classified according to the rating, and the subsidies are allocated in the descending order of the rating. This method will contribute to the increase in the efficiency of the financial resources used by state, and allows to adjust the existing rules of allocating subsidies to agricultural producers. This method might be used together with other instruments for forming an efficient regulation system of the agricultural sector.

### CONCLUSIONS

The existing methods of regulation of the agricultural sector are so far inefficient. Subsidies allocation is important for the development of the agricultural sector, but the existing system does not create incentives for an efficient farm activity. The amount of allocated subsidies is not enough to cover all the demands of the agricultural producers.

Only the enterprises that benefited from a higher amount of subsidies could achieve higher economic results in their activity. Therefore, the priority of granting subsidies should be given to those producers who carry out a stable economic activity, can improve their financial situation benefiting from subsidies and contribute to the increase of this sector's efficiency.

Because of the fact that the government has limited financial resources to subsidize the agricultural producers and in order to increase the efficiency of the allocated subsidies, the enterprises should be selected according to their performance using the method of rating evaluation.

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