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A STUDY ON COMPETITIVENESS OF BULGARIAN FARMS

This paper presents the results of a study on competitiveness of Bulgarian farms in the conditions of EU CAP implementation. First, it presents a new holistic approach for assessing farm competitiveness taking into account economic efficiency, financial capability, adaptability, and level of sustainability of farms. Second, a comparative analysis is made on farms competitiveness of farms in Bulgaria and European Union. Third, an assessment is made on economic efficiency and financial capability of farms of different specialization in Bulgaria. Next, evaluation is made on level and factors of competitiveness of commercial farms of different type and specialization. Finally, an integral assessment is made on competitiveness of farms with different specialization.

JEL: L25; Q12; Q18; Q13

Assessing farm competitiveness in general, of different type and specialization, is among the most current political, managing and scientific debates not only in Bulgaria, but also worldwide[1]. Despite its popularity, there are no publications about the level of farm competitiveness in our country in the conditions of EU CAP implementation.

This paper presents the results of a study on competitiveness of Bulgarian farms at the present stage. First, a new holistic approach is presented for the assessment of farm competitiveness, considering the economic efficiency, financial opportunities, adaptability and the level of sustainability of farms. There is also an assessment of the level and factors of farm competitiveness of different type and specialization in our country.

Framework for Assessing Farm Competitiveness

We define the competitiveness of farm as internal capability (potential, incentives) to sustain competitive advantage of (specific) market/s, leading to high economic performance through constant improvements and adaptation to evolving market, natural and institutional environment[2]. It is typical only for the "market farms" regardless of their specific type – semi-subsistence farms, family farms, cooperatives, business farms etc.

Good farm competitiveness means that a specific farm (1) produces and sells efficiently its products and services on the market, (2) manages effectively its

[1] *Bachev, H*. Management of Farm Contracts and Competitiveness, Saarbrucken: VDM Verlag, 2010; *Benson, G*. Competitiveness of North Carolina Dairy Farms, 2007; *Mahmood, K., A. Saha, O. Gracia, and T. Hemme*. International competitiveness of small scale dairy farms in India and Pakistan, 2004; *Popovic, R., M. Knezevic, and M. Tosin*. State and Perspectives in Competitiveness of one farm type in Serbia, 2009; *Shoemaker, D., M. Eastridge, D. Breece, J. Woodruff, D. Rader, and D. Marrison*. 15 Measures of Dairy Farm Competitiveness, 2009.

[2] Koteva, Bachev, 2010; Bachev, 2010.

finances, (3) it is adaptive to the evolving market, institutional and natural environment, and (4) it is sustainable over time. On the other hand, insufficiency (lack of) competitiveness shows that the farm has serious problems with efficient funding, production and utilization and marketing of produces, due to high productive and/or transaction costs, inability to adapt to the evolving environmental conditions and/or insufficient sustainability over time.

This paper suggests a holistic framework, developed by us, for assessing competitiveness of agricultural farms, which includes a system of criteria and indicators, reflecting the economic effectiveness, financial capacity, adaptability potential and level of sustainability of farms (Figure 1).

Figure 1

Criteria and indicators for assessing competitiveness of agricultural farms

Criteria	Indicators	
	Specific	Integral
Economic efficiency	Labor productivity Productivity Profitability of farm Income per utilized land and livestock	Index of Competitiveness
Financial capacity	Profitability rate of own capital Liquidity Level of financial autonomy	
Adaptability	Level of adaptability to market environment Level of adaptability to institutional environment Level of adaptability to natural environment	
Sustainability	Level of sustainability	

Economic efficiency characterizes the resources supply of farms and the extent to which these resources are utilized. The assessment of this aspect of competitiveness is done through the indicators:

●Labor productivity, which is defined by the formula:

(1) $Lp = NVA\ (GVA)/AWU,$ where:

Lp – labor productivity achieved, lv./AWU;
GVA - gross value added achieved on the farm, lv.;
NVA - net value added achieved on the farm, lv.;
AWU - annual work units.

●Land and livestock productivity, defined as:

(2) $P_l = GP \text{ or } GVA/ UAA$

(3) $P\ a = GP \text{ or } GVA/ 1\ AHU$, where:

Pl – productivity per area unit, lv/da;
Pa – productivity from 1 animal, lv/HU;

GP – gross product achieved on the farm, lv;
UAA – utilized agricultural area on the farm, ha (da);
AHU – animal head units.

●Profitability of farm, defined by the formula:

(4) *Pr = (Income - Costs) x 100 /Costs*, where:

Pr – profitability rate of costs, %.

●Income per utilized land and livestock defined by the formulas:

(5) *I = NI/ 1 farm*

(6) *Il = NI/UAA*

(7) *Ia = NI/AHU*, where:

I - income average per farm, lv;
Il- income average per area unit, lv;
Ia - income average per 1AHU, lv;
NI - net income, created on the farm, lv.

The criterion *financial capacity of the farm* gives information for the financial potential and the effectiveness of management of financial resources. The assessment indicators are:

●Profitability rate of own capital:

(8) $Pr_{oc.} = (NI \times 100)/OC$, where:

$Pr_{oc.}$ *– profitability rate of own capital, %;*
NI – net income achieved on the farm, lv;
OC – own capital, lv

●Liquidity defined as:

(9) *L = CA/CL*, where:

CA - current assets, lv;
CL – current liabilities, lv

●Level of financial autonomy defined as :

(10) *Lf.a. = OC/Fl*, where:

OC – own capital, lv;
Fl – farm liabilities, lv

Adaptability of farms characterizes the ability (inner potential) of farms to adapt to the changes in the surrounding environment. The following indicators are used for its assessment:

●Level of adaptability to market environment, characterizes the potential of the farm to adapt to changes in the market environment – dynamics of demand and agricultural products and services; the evolvement of supply and prices of labor force, agricultural land, materials, services, funding etc. The assessment of

this indicator is performed by farm managers and/or experts in the corresponding field, which determine the level of adaptability as very high, high, average, low or insignificant.

●Level of adaptability to institutional environment, characterizes the potential of the farm to adapt to changes in the institutional environment – different legal and regulatory requirements; quality standards for the product, labor conditions, environmental protection, animal welfare; bio-technological, veterinary and sanitary-hygienic requirements etc.

●Level of adaptability to natural environment, characterizes the potential of the farm to adapt to changes in the natural environment – climatic changes, global warming, drought, natural disasters etc.

The assessment of the last two indicators is similar to that of the indicator for the level of adaptability to the market environment.

Sustainability shows the ability of the farm to exist over time. For its assessment we use the indicator *level of sustainability*, which is determined through assessment of the problems (and costs) for the effective supply of production factors needed on the farm and the effective utilization and marketing of produces and services. First, farm managers and/or experts rank the problems as missing, insignificant, normal, big and unsolvable. Next, the level of sustainability for each of the factors is estimated by converting the levels of management problems with the supply of productive factors and utilization and marketing of produces in levels of sustainability (Table 1).

Table 1

Scale for conversion of levels of problems in levels of sustainability

Seriousness of problems	Level of sustainability
None	High
Insignificant	Good
Normal	Average
Big	Low
Unsolvable	Unsustainable

Individual indicators of competitiveness are with different measure units or quality dimensions. They are directly incommensurable, which does not give a chance to assess the general level of farms' competitiveness.

In order to achieve comparability of the indicators of economic efficiency and financial capacity, the results obtained for each indicator are converted into universal units. For this purpose, a scale is developed, depending on the minimal and maximum value of the corresponding indicator, and depending on the indicator value, farms fall into one of these groups and receive their universal value (Table 2).

Table 2

Scale for conversion of values of indicators of economic efficiency and financial capacity into universal units

Value of corresponding indicator	Universal value
Highest value	1.00
High	0.75
Average	0.50
Low	0.25
Minimal (negative, zero)	0.00

To estimate the general level based on the criteria of economic efficiency and financial capacity, the following formulas are used:

(11) $TE = \alpha_1 x\ Lp + \alpha_2 x\ P + \alpha_3 x Pr + \alpha_4 x I$

(12) $FC = \beta_1 x\ Pro.c. + \beta_2 x\ L + \beta_3 x Lf.a.$, where:

TE - level of the criterion: total economic efficiency;

FC - level of the criterion: financial capacity;

$\alpha_{1,2,3,4}$ – coefficients of weight of the individual indicators;

$\beta_{1,2,3}$ – coefficients of weight of the individual indicators.

The level of total adaptability is (pre)determined by the level of the significant adaptability indicator of the lowest importance, since this criterion characterizes the total farm potential to adapt to changes in the market, institutional and natural environment. For example, regardless of the good adaptability to market and natural environment, the total adaptability of the farm could be low, due to the low adaptability to institutional requirements.

The level of sustainability of agricultural farms is defined by the lowest level of supply sustainability of whichever of the significant production factors or the utilization and marketing of produces. For example, nonetheless the high sustainability of supply with natural, personal and material factors of production, the level of total sustainability of the farm is often low, due to the low stability (effectiveness) in financial management of the activity and/or marketing of the production.

To define farm competitiveness, the quality levels of the criterion overall adaptability and sustainability are converted into quantitative indicators (Table 3).

Table 3

Scale for conversion of the qualitative indicators for adaptability and sustainability in universal indicators

Qualitative value of indicators		Quantitative value
Level of adaptability	Level of sustainability	
Very high	High	1.00
High	Good	0.75
Average	Average	0.50
Low	Low	0.25
Insignificant	Unsustainable	0.00

The integral indicator *index of competitiveness* shows the four aspects of farm competitiveness by making the comparison between different farms easy and uniquely. This index is estimated by the formula:

(13) $Ifc = \kappa_1 xTE + \kappa_2 xFA + \kappa_3 xTA + \kappa_4 xLS$, where:

Ifc – index of farm competitiveness;
TE – total farm efficiency;
FA – financial autonomy;
TA – total farm adaptability;
LS – level of total farm sustainability;
$K_{1, 2, 3, 4}$ – coefficient of weight of the corresponding criteria

The value of the index of competitiveness may vary between 0 and 1, where the farm is defined as highly competitive, with high, good and low competitiveness or as uncompetitive. Defining the comparative weight of individual criteria and indicators in the competitiveness index, and that of the index borders for categorizing farm competitiveness in one group or another, is done by leading experts in the particular area.

Comparative Analysis of Agricultural Farms in Bulgaria and EU

Organizational-Economic Structure

Restoration of farm land to its physical borders to former owners and their heirs, results in fragmentation of agricultural areas. Despite the positive trends of reducing and consolidating organizational structures, our agriculture remains mostly small-scaled. Almost 95% of farms are of size up to 5 ha, and the share of larger farms over 50 ha is about 1% (Table 4).

Table 4

Structure of agricultural farms in Bulgaria and EU (%)

Size of UAA, ha	EU			Bulgaria		
	2003	2005	2007	2003	2005	2007
Up to 5.0	70.0	71.5	70.4	96.8	95.6	94.8
5.1-20.0	16.9	18.0	18.6	2.1	2.8	3.2
20.1-50.0	5.6	5.7	5.9	0.4	0.6	0.8
Over 50	4.5	4.8	5.1	0.7	1.0	1.2

Source: Eurostat and own calculations.

There is a considerable difference in the structure of farms by size of UAA in Bulgaria and in EU-27. The relative share of small farms in the country is about 25% higher. Even more sensitive is the difference in the relative share of medium farms of 5-50 ha – respectively 35% for EU and 4% for our country. The structural changes that are taking place in the sector did not lead to considerable difference in the structure of agricultural farms – the irrational highly dualistic structure has been kept.

In Bulgaria the significant economic and social importance of small, predominantly natural farms up to 1 economic size unit (esu) is still dominating. Over 76% of all farms in the country, fall into this group, while in EU this share is

under 50%. Although only 6% of UAA is being cultivated, 67.8% of labor force regularly employed in agriculture is working on these farms, breeding 26.2% of the animals and nearly 12% of the total standard gross margin is formed there.

The structural changes in agricultural farms by juridical status show that production concentration is typical for all forms of agricultural business and the average size of farms in the country reaches 6,3 ha in 2007 (Table 5). The increase in the average size of farms of natural persons (2.1 ha for 2007) is insignificant, due to their low potential. And currently the large agricultural structures are identified by farms of legal persons (medium cooperatives size – 628.3 ha; of companies – 442.2 ha), which although representing about 1%, they operate 67% of UAA in the country. Keeping the irrational organizational-economic structure complicates CAP of EU application and implementation of contracted funds, affecting the distribution of support among agricultural farms.

Table 5

Dynamics in the number of farms and the size of UAA in Bulgaria

Legal status	Number of farms		2005	2007	
	2005	2005	UAA, ha	UAA, ha	Medium size
Total	*520 529*	*481 920*	*2 729 390*	*3 050 745*	*6.3*
Natural persons	512 300	476 956	914 739	1 033 468	2.1
Sole traders	2158	1828	453 597	408 786	223.6
Cooperatives	1525	1156	890 870	726 305	628.3
Companies	1312	1763	522 559	781 884	442.2
Associations etc.	234	217	46 625	100 301	462.2

Source. MAF. “Agricultural statistics”.

Economic Potential of Agricultural Farms

Smaller sizes of farms in the country predetermine their lower economic potential compared to EU. Over 90% of farms are falling into the group with low economic potential (1-8 esu), and this share is one third less for EU (Table 6). There is a significant difference in the share of farms over 40 esu, respectively near 12% in EU, and in Bulgaria – below 3%.

Table 6

Structure of farms over 1 esu, 2007

Economic size of farms, esu	Farms share, %	
	EU-27	EU-27
From 1-8	64.5	90.4
From 8-16	12.4	4.1
From 16-40	11.5	2.7
From 40-100	7.4	1.4
Over 100	4.2	1.4

Source: Eurostat and own calculations.

In Bulgaria, as well as in EU, there is a serious difference in the economic potential of farms regarding their legal status. The economic potential of legal persons' farms (Sole traders, cooperatives, companies) in the country is getting closer to that of EU. They, however, represent only 1% of all farms. The pattern of Bulgarian and European agriculture is defined by family agricultural farms. Family farms in Bulgaria have significantly lower economic potential – 4.4 esu and the average size for EU-27 is 15.2 esu. The low economic potential of farms, with small sizes and not enough provision of resources, sets serious limits to the opportunities for effective implementation of production factors and euro subsidies access.

Prevailing share of family farms in the organizational-economic structure and their low economic potential affect also the low medium economic size of farms in the country (Table 7). The medium economic size of farms in EU is almost 3 times higher than that for Bulgaria.

Table 7

Economic size of farms over 1 esu, 2007

Medium economic size of farms, esu		Medium economic size, esu		
		Families	Legal persons	Others
EU-27	20.5	15.2	144.1	111.6
Bulgaria	7.9	4.4	132.0	92.8

Source: Eurostat and own calculations.

Technical and Technological Level of Production

Our agriculture is characterized by lower technical and technological level and incomplete infrastructure. For example, the medium size of fixed assets per farm in Bulgaria is 25 340 €, and in EU-27 it is 10 times higher – 26 1015 € (EUFADN). The investment support for EU producers is considerably higher - 442 €/farm, and 70.4 € in our country.

Our production is less intensive than the European. Data show that the irrigated areas are symbolic, two times less fertilizers are used, and more than two times less resources are put aside for plant protection measures (MAF). Lack of agro-technical measures lead to stronger dependence on natural-climatic conditions, and result in less productivity and efficiency.

Specialization and Integration

Typical for Bulgarian agriculture is the lower level of production specialization, not enough association and cooperation of agricultural producers, the lower level of horizontal and vertical integration. More than half of the farms are non-specialized. The number of structured organizations of producers is symbolic and the reasons for that are objective (financial, economic, productive and so on) and subjective. Processing enterprises are not participating actively enough in the building of vertical integration with agricultural producers in order to supply them with the resources they need.

Economic Results

The problems discussed in the organizational-production structure of agriculture in our country are affecting negatively the economic results of agricultural farms. Despite the increase in the average gross product (GP), produced in the farms, its amount remains significantly lower than the GP, accomplished by the farms in EU. For 2008 it represents only 37% of the GP produced in farms in EU-27 (Figure 2). The lower size of output produced determines the lower productivity per unit area (expressed in GP/ha). The average productivity achieved by farms in EU-27 is 905.8 €/ha, while in our country it is more than 2 times lower, respectively – 402.2 €/ha.

Figure 2

Dynamics of gross product per farm at basic prices

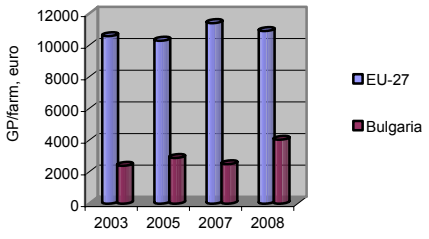
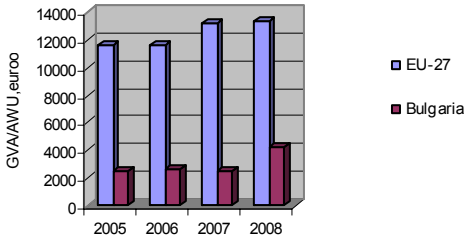


Figure 3

Dynamics of labor productivity at basic prices



Source: Eurostat

The reasons for the lower productivity of our farms should be found mainly in: irrational production structure (small share of intensive crops, decrease in the share of livestock production in GP); and predominantly small and extensive production.

The productivity that has been reached in our country is also much lower than the average for EU countries. For 2005 it is 21% and in 2008 - 32% from the average productivity that has been reached in EU EC-27 (Figure 3). Our competitive advantages (the favorable natural-climatic conditions and lower wages) are not enough to compensate the other factors (not enough resources, inefficient use of production factors, insufficient degree of specialization, concentration and cooperation of production), which influence unfavorably the productivity level.

The following conclusions can be made on the basis of the results from the carried out comparative analysis:

●Agricultural farms in the country have lower productivity, productiveness and effectiveness, which makes them uncompetitive on the common European

market. CAP of EU support has a positive impact on the economic situation of agricultural farms – increasing the incomes of producers, increasing the productiveness of production factors and effectiveness of production. The received support concerning different measures and mechanisms, however, is insufficient for the purpose of great increase in the competitiveness of agricultural farms.

●Small number of big economic structures in the country are developing in economic boundaries, comparable to European ones, and they have potential for acquiring subsidies from CAP of EU and national support, opportunities for investment and production innovation, which determines their good competitive positions.

●The key factors (conditions) of permanent nature, determining the lower level of competitiveness of our farms are: irrational organizational-economic structure; land fragmentation and prevailing small utilized area; insufficient provision of resources, lower technical and technological level of production; dominating extensive production structure; lower level of horizontal and vertical integration; incomplete infrastructure that is not corresponding to contemporary requirements (production, consulting and scientific services, warehouse and service facilities, meliorations and so on); lower level of specialization and concentration of production; not enough associating and cooperation between the producers.

Economic Efficiency and Financial Capacity of Agricultural Farms with Different Typology in Bulgaria

The study is based on data from 2007 for 1916 agricultural farms with economic size over 1 esu, included in the Farm Accountancy Data Network (FADN). The major part of the farms is specialized in field crops (575), 307 are specialized in vegetables, 307 in permanent crops, 452 in grazing livestock and 275 with pigs and poultry. Relatively big farms are included in the observed sample. Medium sized farms by typology are: field crops – 540.9 da utilized agricultural area (UAA), vegetables – 17.2 da, permanent crops – 151.0 da, grazing livestock – 134.6 da, pigs and poultry – 30.4 da. The average number of animals per farm is respectively – 62.6 cows, 36.4 ewes, 31.3 pigs and 2767.2 birds.

Economic Efficiency Analysis

Data analysis of *labor productivity* shows that the highest level achieved is in farms with field crops – 14 649.9 lv/AWU, which is about twice higher in comparison to farms with other typology (Figure 4). The result that has been achieved is due to the high level of mechanization in the sector, which allows the realization of high net value added with minimal labor input. Second place of labor productivity take farms with vegetables and permanent crops. Livestock breeding farms have lower labor productivity compared to crop farms, due to their lower technical provision and higher labor input.

Figure 4
Labor productivity of farms

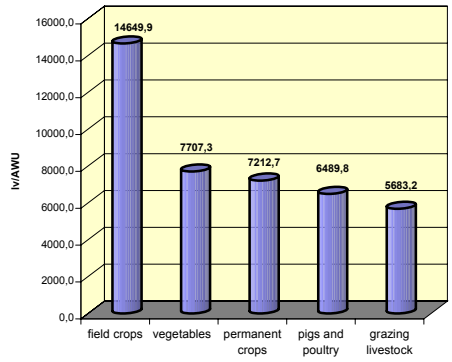
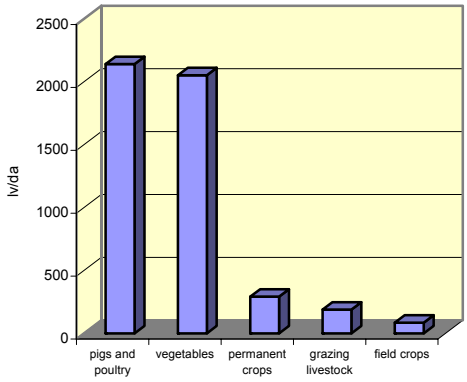


Figure 5
Land productivity of farms



Source: FADN and own calculations.

Land productivity analysis shows that farms, specializing in breeding pigs and poultry, have reached the highest gross product (GP) (65 144 lv), followed by farms with field crops (58 223 lv), permanent crops (44 133.2 lv) and vegetables (35 390 lv) (Figure 5). The lowest results are accomplished in farms with grazing livestock – 25 496 lv. When comparing the averaged data for the level of GP and UAA, information shows that high productivity that has been achieved with field crops is due mainly to the significantly better supply of land resources.

In order to eliminate the impact of the farm size on the accomplished productivity, the indicators for productivity per unit area and animal head unit have been used in the economic analysis. Data show that the level of productivity accomplished in vegetable farms and farms breeding pigs and poultry (over 2000 lv/da) are much higher compared to other specialized units. Finally, there are field crop farms with 85.6 lv/da. Traditionally low income in the sector shows that farms with intensive crops can successfully develop only in large-scale production.

Comparative analysis of crop farms with intensive crops shows alarming results – the productivity achieved in permanent crops is over 7 times lower than that in vegetable production. The sector is in crisis and it is deepening, which can be confirmed by the results from previous studies[3]. Productivity of 582 lv/da for 2005 has decreased to more then 2 times for 2 years – in 2007 it is 292.3 lv/da. The problems that have been indicated, related to the bad condition of crops (high share of uncultivated and amortized permanent crops, left to die; super extensive production; low share of the newly created massifs), determine the low output levels of productivity.

[3] Risina, 2009.

The outlined problems apply to greater extent to fruit production, compared to cultivation of vineyards.

The analysis of livestock farms shows that farms, specializing in pigs and poultry breeding, are significantly more productive than those that are breeding grazing livestock (Table 8), which is due mainly to the 2,5 times higher realization of gross product. The great difference in productivity per area unit is due to the significantly smaller provision of land in farms with pigs and poultry. Reasons for the difference in productivity per animal head unit should be looked for in the low productive quality of livestock breeding and the predominantly extensive way of producing in the farms, specializing in grazing livestock.

Table 8

Livestock breeding productivity

Farm indicator	Farm typology	
	Pigs and poultry	Grazing livestock
Gross product, lv	65 144.0	25 496.0
Average nr. AHU	44.7	66.9
GP/AHU, lv	1365.0	381.1

Source: FADN data and own calculations.

Analyzing the *income* achieved, the used indicators have been estimated with and without the current subsidies received, in order to take into account the influence of the received public support. The highest average net income has been achieved in field crops farms – 17 466.7 lv (Figure 6). For the realization of high level of net income (NI) on the farms, current subsidies have a significant contribution to that – direct payments, national co-payments etc. The average subsidies that have been received per farm (10 487.4 lv) are higher than the realized net income (6979.3 lv). Accordingly, the received support has substantial impact on increasing field crops farms income.

Figure 6

Average income of farms

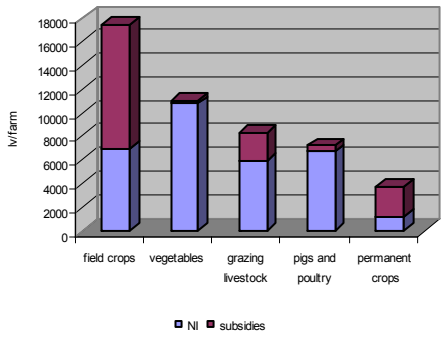
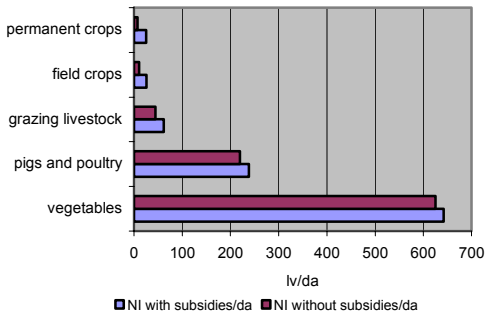


Figure 7

Income per area unit of farms



Source: FADN and own calculations.

Although they have significantly smaller size, the second place take farms, specialized in vegetable production – with 11 051 lv and the received subsidies are of minimal share when forming the net income – only 2.7%. The larger support received determines the higher income of farms with grazing livestock, compared to farms with pigs and poultry.

The low productivity achieved, the risky character of production, the high capital demand, labor demand and considerable operating costs determine the lowest income for farms with permanent crops, respectively with subsidies - 3780 lv and without subsidies -1154.8 lv. Taking into account the conditions in the sector and the serious problems, the received support is insufficient for developing effective production.

The highest income per area unit has been achieved by farms in vegetable production – 642.5 lv./da (Figure 7). Data confirm that growing vegetables is productive and highly profitable activity, regardless of the smaller size of the farms.

The other intensive crops – the permanent crops, the lowest income per area unit has been achieved – 25.0 lv/da, which is even lower than that of field crops – 25.6 lv/da. For farms with permanent crops, the share of land costs, labor costs, capital costs and amortization costs is the highest. Considering the low productiveness and high expenses, farmers in the sector are facing serious economic problems.

Analysis of the output achieved in livestock breeding farms shows that higher income has been accomplished in breeding pigs and poultry (162.2 lv/AHU), in comparison to grazing livestock (123.8 lv/AHU) (Table 9). Although, the reached productivity is almost over 3 times higher in breeding pigs and poultry, the difference in income is minimal. The reason for that is in the much higher intermediate consumption (in breeding pigs and poultry -1033 lv/AHU, and for grazing livestock – only 227.4 lv/AHU).

Table 9

Income of specialized livestock breeding farms

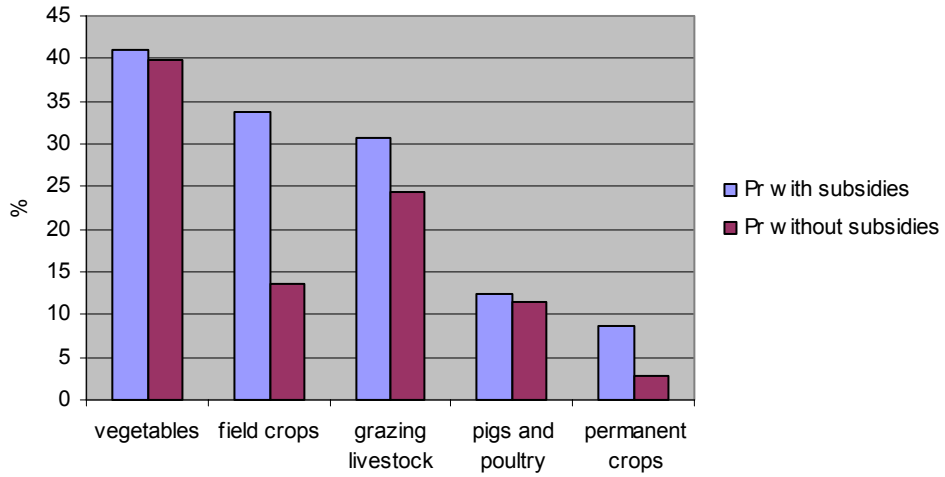
Farm indicator	Farm typology	
	Pigs and Poultry	Grazing livestock
Net income, lv	7251.1	8283.7
Average number AHU	44.7	66.9
NI/AHU, lv	162.2	123.8

Source: Data from FADN and own calculations.

The comparative analysis of *the profitability of farm* shows that the highest rate has been achieved in farms with vegetables - 40%, followed by farms with field crops - approximately 35%, with grazing livestock - 30%, and for the rest – about and below 10% (Figure 8). For field crop farms, the received subsidies have a great impact on increasing the level of profitability. For farms with permanent crops and grazing livestock – subsidies have smaller influence, and for the rest of the farms – the influence is below 1%.

Figure 8

Profitability rate by farm typology



Source: FADN and own calculations.

Financial Capacity Analysis

The amount of fixed assets is an indicator for the resource provision of farms and depends to a great extent on their typology. The largest amount of fixed assets is that of farms with permanent crops – average 145 th. lv. Two times lower is the amount of fixed assets for field crops farms – approximately 63 th. lv. (Table 10).

Table 10

Indicators of financial security of farms

Farm typology	Fixed assets amount, lv	% fixed assets of total assets	Investment subsidies, lv	Amount of own capital, lv
Field crops	54522.2	57.1	192.9	79826.1
Vegetables	44180.7	74.3	374.9	39925.4
Permanent crops	144997.1	67.7	387.8	152771.5
Grazing livestock	35600.9	65.5	36.8	49202.7
Pigs and poultry	52429.4	59.1	87.5	68198.8

Source: FADN and own calculations.

The low average amount of investment subsidies received by the farms shows that these subsidies will neither influence significantly fixed assets innovation, nor increase the supply of natural resources of farms. Although the

highest average amount of investment subsidies is provided to farms with permanent crops, considering the condition of the massifs and the high capital demand for the creation of these crops (2-5 th. lv/da), this support is highly insufficient.

The level of *liquidity* provides insight for farms opportunities to face their current liabilities. When there is a reasonable ratio of short-term assets/current liabilities - 2:1, we have high liquidity for all farms (Table 11). On the one side this is an indication that farms are able to cover their short-term obligations. On the other hand, however, it indicates the high value of short-term assets, which may be due to no utilization and marketing of produces and low turnover of working capital. This indicator is the highest for farms with grazing livestock – 8.7, over 4 times higher than the advisable level, and for farms with field crops – respectively 5.6.

Table 11

Financial indicators of agricultural farms

Farm typology	Pr of own capital, %	Liquidity	Level of financial autonomy
Field crops	21.9	5.6	0.8
Vegetables	27.6	4.5	0.7
Permanent crops	2.5	3.6	0.7
Grazing livestock	16.8	8.7	0.9
Pigs and poultry	10.6	3.7	0.9

Source: FADN and own calculations.

The analysis of the *level of financial autonomy* also shows high values for all the farms. As a good level of financial autonomy is accepted Lf.a.=0.5, where risk is divided equally between the farm and the bank. The obtained level of this indicator, respectively for farms with intensive crops – 0.7, for field crops – 0.8 and for livestock breeding – 0.9, also can be interpreted bilaterally. On the one side, they characterize the financial stability of the farms. On the other side, they show limited usage of credits as sources for financing investment projects in agriculture.

In all farm typologies a positive *profitability rate of own capital* has been achieved. Depending on the farm typology, the level of the indicator moves in a wide range. The highest level of profitability rate has been accomplished in vegetable farms and field crops farms. The level of the indicator proves the better opportunities for wider reproduction and better perspectives for development of these farms.

If there is a comparatively lower level of average net income per farm, but also smaller amount of own capital, grazing livestock farms have accomplished a good level of effectiveness – 16.8%. The level of the indicator is exclusively low for

permanent crops farms – 2.5%. Considering the exceptionally low economic indicators and the high capital demand of this production, farms are facing incapability of providing normal production activity.

The following conclusions can be made, based on the comparative analysis of the economic efficiency and financial condition:

●Vegetable farms have the highest economic efficiency. Despite their small sizes, they reach high income levels, productivity and profitability of production. In the second place there are farms with field crops. The larger scale of utilized area and higher level of mechanization determine their high productiveness, and the received subsidies have significant contribution to increasing their level of productivity, income and profitability. Permanent crops farms have the lowest efficiency rate. The exclusively low economic indicators show that the sector is in crisis and it is deepening.

●There are no significant differences in the levels of the separate indicators for the financial situation by farm typology. The general assessment is that the financial condition of the farms is not good, and the farms in the worse condition are those with permanent crops. The limited access of farms to credits is a serious obstacle for the realization of investment projects and modernization of production.

Assessment of Competitiveness of Commercial Holdings in Bulgaria

The competitiveness study of commercial farms is based on survey information from the summer of 2010, which has been provided by the managers of 90 farms[4] of different type and typology from all regions of the country. About 58% of the respondent farms are cooperatives, one third of them are property of natural persons and 10% are different type of companies. The majority of farms are specialized in field crops (57%), 14% are of cropping and breeding orientation, 13% are of mixed cropping, 9% are in permanent crops, 3% are specializing in vegetables, and about 1% are specialized in grazing livestock, pigs and poultry and mixed breeding.

The managers had the opportunity to pick up one of the levels that best suits the condition of their farm for each one of the indicators of the three competitiveness criteria. The evaluations of the managers are converted into quantitative values according to the already described approach. Experts from the Institute of Agricultural Economics suggested giving equal weight to the corresponding indicators when forming the level of the separate criteria and respectively equal coefficients of correction of the criteria when estimating the integral index of competitiveness.

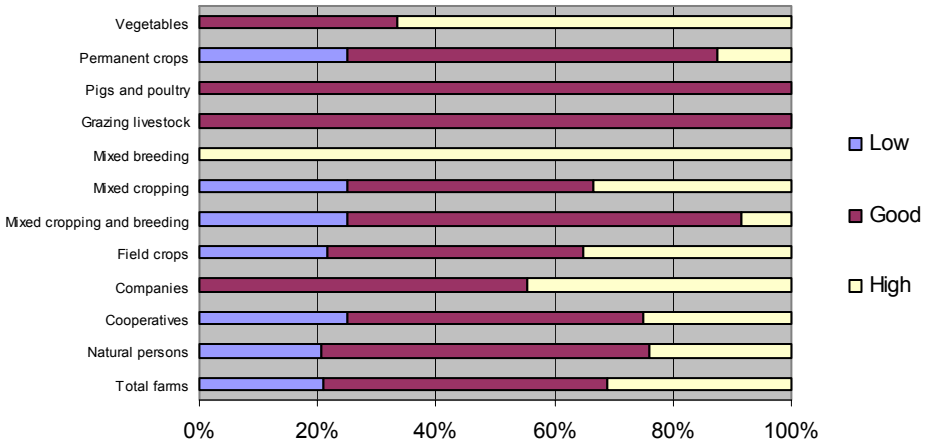
[4] The whole production of the surveyed farms is designated for the market

Level and Factors of Competitiveness

The assessment of competitiveness of the farms that took part in the survey shows that the majority of farms are with *good* and *high* competitiveness (Figure 9). In addition to that, however, more than one fifth of all the farms are with *low* level of competitiveness. What's more, the different types and kinds of farms are with *different* competitiveness. Agricultural farms (sole traders and companies) are having good competitive positions, and the share of farms with high competitiveness is particularly large. On the other hand, one fourth of the *cooperatives* have unsatisfactory competitiveness.

Figure 9

Share of farms with different level of competitiveness



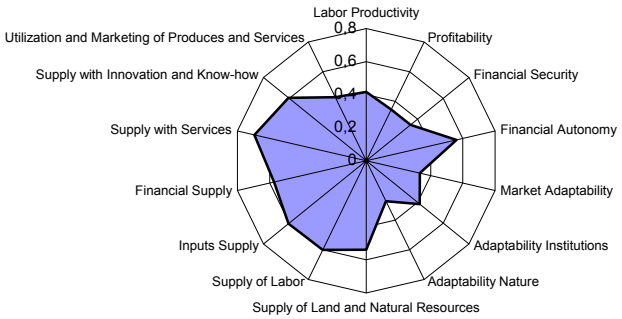
Source: Interview with managers of companies.

Most of the highly competitive farms are specialized in *mixed-breeding* and *vegetables*. In all the other typology groups, farms with good competitiveness constitute the main share in the corresponding groups. One out of four farms, specializing in *mixed cropping-breeding*, *mixed cropping* and *permanent crops* is uncompetitive.

The analysis of different *aspects* of competitiveness of farms shows that the low productivity, profitability and financial security of farms and the insufficient adaptability to the market, institutional and natural environment, along with the serious problems with financial provision and innovations, and the problems with the marketing of production and services, contribute to greater extent to the decrease in the total competitiveness (Figure 10).

Figure 10

Significance of specific elements of farms competitiveness



Source: Interview with farm managers.

The analysis of the *efficiency level* of different farms typology shows that the majority of farms are with good productivity, profitability, financial autonomy and financial self-sufficiency (Table 12). Although, however, according to the majority of managers of farms-natural persons, that specialize in grazing livestock, pigs and poultry and mixed cropping-breeding farms, the level of *productivity* is low.

What's more, the *profitability* of 36% of all the farms is estimated to be low, and those who are part of this group are more than half of the natural persons, considerable part of farms with mixed cropping and breeding production, mixed cropping, grazing livestock, and pigs and poultry.

According to the majority of the farm managers that have been interviewed, the *financial autonomy* of farms is low. The lack of financing is usually faced by natural persons and farms, specializing in mixed cropping and cropping-breeding, grazing livestock, pigs and poultry, and permanent crops.

Moreover, one fifth of the surveyed farms are highly *dependable on external sources of financing* (credit, state assistance and so on), and most of the dependable farms are specializing in permanent crops and vegetables.

The analysis of the *level of adaptability* of the farms, that took part in the survey, shows that more than one fourth of them have low potential of adaptability to the new *national and European regulations for quality, safety, environment etc*. Almost 37% of the farms have low adaptability level to *market prices, demand and competitiveness*, and every second one of them is maladaptive to *changes in the natural environment* (warming, extreme weather conditions, drought, floods etc.) (Table 13).

Table 12

Share of Farms with Different Efficiency Level in Bulgaria (percentage)

Farm Typology	Productivity			Profitability			Financial Security			Financial Autonomy		
	low	good	high	low	good	high	low	good	high	low	good	high
Natural persons	44.83	48.28	6.90	51.72	37.93	10.34	62.07	20.69	17.24	51.72	34.48	13.79
Cooperatives	11.54	84.62	1.92	26.92	73.08	0.00	25.00	75.00	0.00	23.08	53.85	23.08
Companies	11.11	55.56	33.33	33.33	55.56	11.11	33.33	55.56	11.11	22.22	55.56	22.22
Field crops	15.69	74.51	9.80	29.41	64.71	5.88	29.41	60.78	9.804	25.49	54.9	19.61
Mixed cropping-breeding	38.46	46.15	7.69	46.15	53.85	0.00	46.15	46.15	7.69	46.15	38.46	15.38
Mixed cropping	33.33	66.67	0.00	50.00	50.00	0.00	41.67	58.33	0.00	33.33	50.00	16.67
Mixed breeding	0.00	100.00	0.00	0.00	0.00	100.00	0.00	100.00	0.00	0.00	100.00	0.00
Grazing livestock	100.00	0.00	0.00	100.00	0.00	0.00	100.00	0.00	0.00	100.00	0.00	0.00
Pigs and poultry	100.00	0.00	0.00	100.00	0.00	0.00	100.00	0.00	0.00	100.00	0.00	0.00
Permanent crops	0.00	100.00	0.00	25.00	75.00	0.00	62.50	37.50	0.00	37.5	25.00	37.50
Vegetables	33.33	66.67	0.00	33.33	66.67	0.00	33.33	66.67	0.00	33.33	33.33	33.33
Total farms	22.22	70.00	6.67	35.56	60.00	4.44	37.78	55.56	6.67	32.22	47.78	20.00

Table 13

Share of Farms with Different Adaptability in Bulgaria, (percentage)

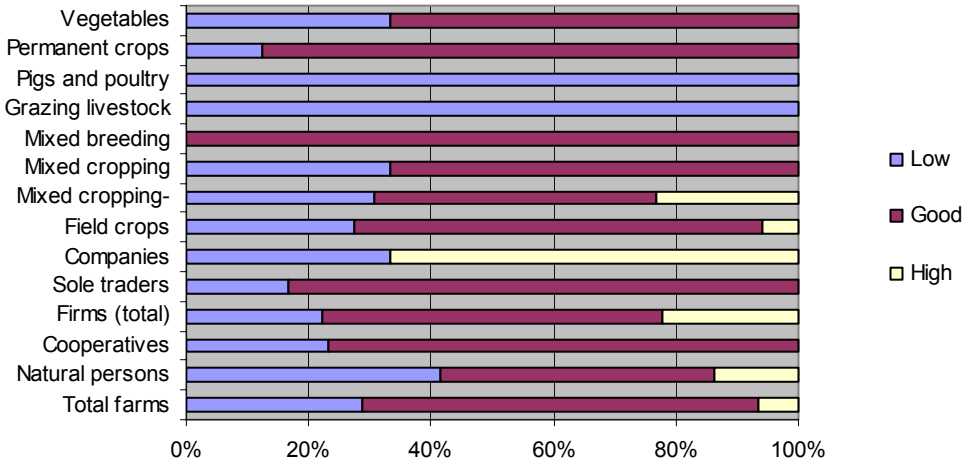
Farm typology	Adaptability to:								
	market			institutions			nature {		
	low	Good	high	low	good	high	low	good	high
Natural persons	51.72	48.28	0.00	31.03	68.97	0.00	37.93	55.17	6.90
Cooperatives	34.62	65.38	0.00	23.08	71.15	5.77	61.54	36.54	0.00
Companies	0.00	66.67	33.33	22.22	22.22	55.56	22.22	44.44	33.33
Field crops	41.18	54.90	3.92	21.57	64.71	13.73	54.90	41.18	3.92
Cropping-breeding	38.46	61.54	0.00	38.46	61.54	0.00	38.46	61.54	0.00
Mixed cropping	25.00	75.00	0.00	16.67	83.33	0.00	58.33	25.00	16.67
Mixed breeding	0.00	100.00	0.00	0.00	100.00	0.00	0.00	100.00	0.00
Grazing livestock	100.00	0.00	0.00	0.00	100.00	0.00	0.00	100.00	0.00
Pigs and poultry	100.00	0.00	0.00	0.00	100.00	0.00	0.00	100.00	0.00
Permanent crops	25.00	75.00	0.00	37.50	62.50	0.00	50.00	37.50	0.00
Vegetables	0.00	66.67	33.33	33.33	33.33	33.33	0.00	66.67	33.33
Total farms	36.67	60.00	3.33	25.56	65.56	8.89	50.00	43.33	5.56

Source: Interview with farm managers.

Medium-term sustainability of farms is estimated as low by 29% of the farm managers (Figure 11). The biggest share of farms with low sustainability is that of natural persons and those specialized in grazing livestock and pigs and poultry. On the other hand, less than 7% of all farms "foresee" high sustainability in the medium term. Only one type of firms – *the Companies* are making an exception among the surveyed farms, and two-thirds of them forecast high sustainability in the short-term perspective.

Figure 11

Share of farms with different medium-term sustainability



Source: Interview with farm managers.

Detailed analysis of different *factors*, decreasing the long-term effectiveness and sustainability of farms, shows that the *significant problems with effective utilization and marketing of produces and services* and problems with the effective *supply of needed innovation and know-how* are among the most important factors for the majority of the interviewed farms. (Table 14). This suggests that these farms do not have (inner) potential for adaptation, which could help them overcome the indicated types of problems, and they will be unsustainable (inefficient) in the long-term. These farms should either restructure production, or re-organize (new management), or they will have to close their activity in the near future.

Serious (unsolvable) problems, related to the *marketing* are critical for a significant part of agro-firms and farms, specialized in mixed cropping-breeding production and permanent crops. Great difficulties with the effective *supply of needed innovations and know-how* are most important for the sustainability of cooperatives, mixed breeding and vegetable farms.

Table 14

Share of Farms with Different Problems Level Regarding Sustainability of Farms in Bulgaria, (percentage)

Problem types	Total farms	Natural persons	Cooperatives	Firms	Field crops	Cropping-breeding	Mixed cropping	Mixed breeding	Grazing livestock	Pigs and poultry	Permanent crops	Vegetables
Effective supply of needed land and natural resources												
Insignificant	23.33	37.93	17.31	11.11	23.53	15.38	25.00	0.00	0.00	100.00	25.00	33.33
Normal	61.11	44.83	67.31	77.78	62.75	69.23	66.67	100.00	100.00	0.00	37.50	33.33
Significant	14.44	17.24	13.46	11.11	13.73	15.38	8.33	0.00	0.00	0.00	25.00	33.33
Effective supply of needed labor												
Insignificant	34.44	51.72	26.92	22.22	33.33	30.77	33.33	0.00	0.00	100.00	50.00	33.33
Normal	51.11	31.03	61.54	55.56	50.98	53.85	58.33	100.00	0.00	0.00	50.00	33.33
Significant	14.44	17.24	11.54	22.22	15.69	15.38	8.33	0.00	100.00	0.00	0.00	33.33
Effective supply of needed material inputs												
Insignificant	32.22	48.28	25.00	22.22	29.41	46.15	41.67	0.00	100.00	100.00	12.50	0.00
Normal	56.67	31.03	69.23	66.67	66.67	30.77	50.00	100.00	0.00	0.00	62.50	33.33
Significant	11.11	20.69	5.77	11.11	3.92	23.08	8.33	0.00	0.00	0.00	25.00	66.67
Effective supply of needed funding												
Insignificant	30.00	55.17	13.46	44.44	31.37	38.46	25.00	0.00	0.00	100.00	0.00	66.67
Normal	54.44	20.69	73.08	55.56	56.86	30.77	66.67	100.00	0.00	0.00	75.00	33.33
Significant	14.44	24.14	11.54	0.00	9.80	30.77	8.33	0.00	100.00	0.00	25.00	0.00
Effective supply of needed services												
Insignificant	48.89	51.72	44.23	66.67	49.02	46.15	66.67	0.00	0.00	100.00	37.50	33.33
Normal	41.11	27.59	51.92	22.22	43.14	30.77	25.00	100.00	100.00	0.00	62.50	33.33
Significant	10.00	20.69	3.85	11.11	7.84	23.08	8.33	0.00	0.00	0.00	0.00	33.33
Effective supply of needed innovation and know-how												
Insignificant	42.22	62.07	30.77	44.44	43.14	23.08	41.67	0.00	100.00	100.00	50.00	66.67
Normal	36.67	20.69	44.23	44.44	37.25	46.15	41.67	100.00	0.00	0.00	25.00	0.00
Significant	20.00	17.24	23.08	11.11	19.61	30.77	16.67	0.00	0.00	0.00	12.50	33.33
Effective utilization and marketing of produces and services												
Insignificant	17.78	34.48	5.77	33.33	17.65	15.38	16.67	0.00	100.00	100.00	0.00	33.33
Normal	50.00	37.93	59.62	33.33	56.86	46.15	50.00	100.00	0.00	0.00	12.50	66.67
Significant	30.00	27.59	30.77	33.33	23.53	38.46	33.33	0.00	0.00	0.00	75.00	0.00

Source: Interview with farm managers.

One-fourth of farms specialized in vegetables and permanent crops are facing significant problems with the effective *supply of needed land and natural resources*. Serious problems with the *effective supply of needed labor* are only crucial for grazing livestock farms.

Considerable part of the natural persons and farms specializing in vegetables, permanent crops and mixed cropping-breeding production are facing major difficulties with the *effective supply of needed material inputs*. The majority of natural persons and farms specializing in grazing livestock, mixed cropping-breeding and permanent crops are reporting significant problems with the *effective supply of needed funding*. Finally, sensitive problems with the *effective supply of needed services* are typical for a big share of the natural persons and farms specialized in permanent crops and mixed cropping-breeding activities.

Competitiveness by Types of Agricultural Farms

The majority of the surveyed *farms of natural persons* have *good* level of competitiveness and about 24% of them are *highly* competitive (Figure 12). At the same time, more than one-fifth of all the natural persons are uncompetitive.

Figure 12

Share of natural persons farms by levels of competitiveness

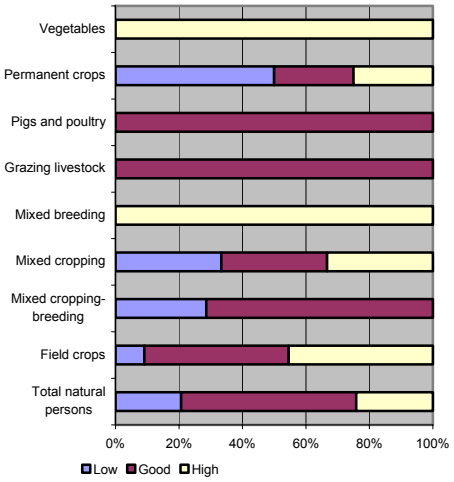
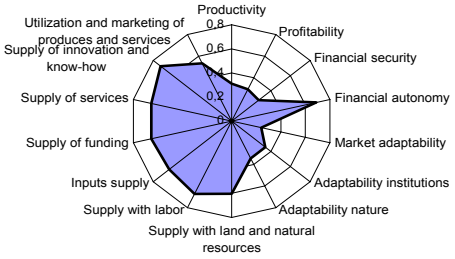


Figure 13

Significance of individual elements on the competitiveness of natural persons



Source: Interview with farm managers.

Farms of natural persons with different specialization *do not have the same* competitiveness. The largest share of highly competitive farms is that of farms specializing in *vegetables*, *field crops* and *mixed breeding*. On the other hand, half of

the natural persons' farms specializing in *permanent crops*, one-third of the *mixed cropping* and 29% of *mixed cropping-breeding* are with low level of competitiveness.

The analysis of the separate *components* of competitiveness of natural persons shows that low productivity, profitability and financial security, together with insufficient adaptability to the evolving market, institutional and natural environment, and serious problems with marketing of produces, are the main reasons for the decreased competitiveness of these farms (Figure 13). Whereas, high effectiveness of supply with production factors and low dependency on external funding increases the total competitiveness of the natural persons' farms.

Half of the agricultural *cooperatives* have *good* level of competitiveness, and one-fourth of them are *highly* competitive (Figure 14). At the same time, every fourth cooperative is uncompetitive. Cooperatives of specific type and specialization have *different* level of competitiveness. Cooperatives with very high level of competitiveness are those specialized in *permanent crops* and *mixed cropping*. In addition, a significant number of cooperatives with *field crops* and *mixed cropping* are less competitive.

Figure 14

Share of cooperatives with different level of competitiveness

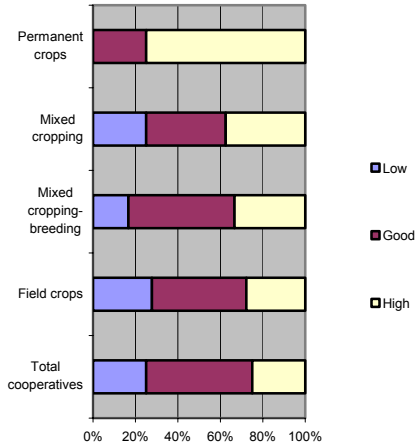
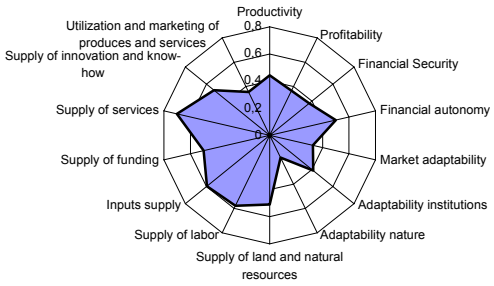


Figure 15

Significance of individual elements on the competitiveness of cooperatives



Source: Interview with farm managers.

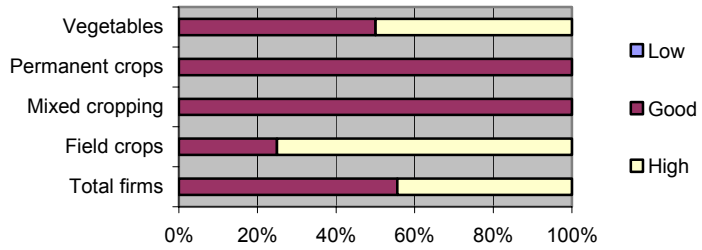
The analysis of specific *elements* of competitiveness of the cooperatives shows that low productivity, profitability, financial security and financial autonomy, together with the insufficient adaptability to market, institutional and natural

environment, and the difficulties related to financial security, labor force and innovations, and those in marketing, lead mainly to decrease in the competitiveness of cooperatives (Figure 15).

All the surveyed *agro-firms* have *good* or *high* competitiveness. Furthermore, a significant number of these agricultural farms (44%) are highly competitive (Figure 16). Although, if three-fourths of the firms that are specializing in *field crops* have high competitiveness, all the firms specialized in *mixed cropping* and those in *permanent crops* have good competitiveness, and those firms specialized in *vegetables* are equally distributed among the groups with good and high competitiveness.

Figure 16

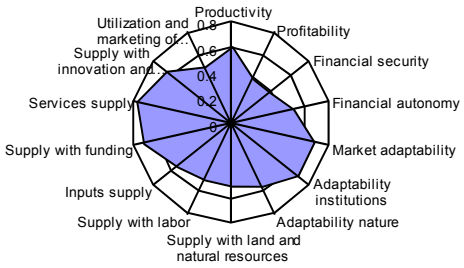
Share of agricultural firms with different level of competitiveness



Source: Interview with farm managers.

Figure 17

Significance of individual elements for competitiveness of agricultural firms



Source: Interview with farm managers.

The analysis of the individual *factors* of competitiveness of agricultural firms shows that the low productivity, profitability, financial security and autonomy, and serious problems with the supply of needed labor and land, and problems with marketing of produces influence greatly the decrease in firms' competitiveness (Figure 17). On the other hand, the high adaptability of firms to the evolving market and institutional environment, and their significant effectiveness in supplying the needed funding, innovation and services increase the competitiveness of these agricultural farms.

Having applied the suggested holistic framework for assessing competitiveness of agricultural farms in our country, we came to the conclusion that individual farms of specific type and specialization have completely different effectiveness, adaptability and sustainability in the specific conditions of undeveloped markets, poorly defined and/or sanctioned formal rights and regulations, ineffective forms of public intervention, specific "Bulgarian" way of applying the "common" policies of EU, wide domination of informal "game rules" etc. Furthermore, the various farm organizations do not have the same competitive advantages in the fast evolving market, institutional and natural environment. While most commercial farms have good competitiveness, a significant part of the agricultural firms are highly competitive and a big share of the natural persons and cooperatives are uncompetitive.

An Integrated Assessment of Competitiveness of Agricultural Farms in Bulgaria

According to the developed methodological approach, the summarized (average) assessments are defined for each of the following criteria - effectiveness, financial capacity, adaptability and sustainability (Table 15, Figures 18 - 22).

Table 15

Summarized Levels by Individual Criteria for Assessment of Competitiveness of Farms

Farm typology	Level by criterion			
	Total efficiency	Financial capacity	Adaptability	Sustainability
Field crops	0.69	0.41	0.34	0.59
Vegetables	0.75	0.33	0.61	0.55
Permanent crops	0.12	0.08	0.29	0.48
Grazing livestock	0.31	0.33	0.33	0.57
Pigs and poultry	0.44	0.16	0.00	1.00

Source: "Agricultural Statistics", data from the survey and own calculations.

Figure 18
Field Crops Farms

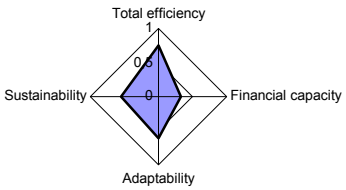


Figure 19
Vegetable Farms

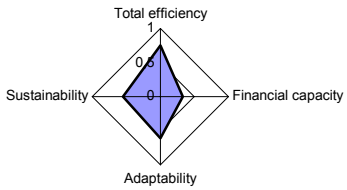


Figure 20
Permanent Crops Farms

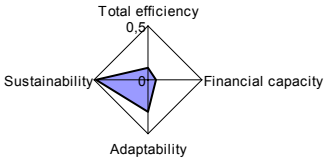


Figure 21
Farms with grazing livestock

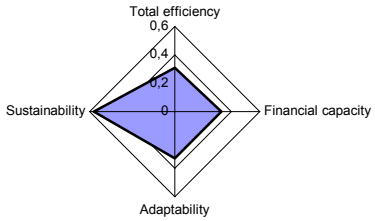
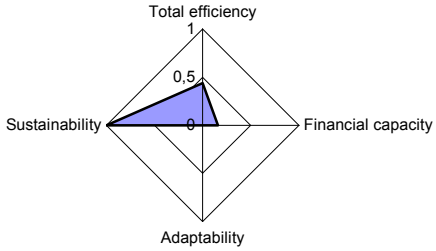


Figure 22
Farms with pigs and poultry



When estimating the first two criteria, data that have been used for the observed farms was included in FADN, and the other two criteria are defined by the results of the performed surveys. In order to accomplish commensurability when defining the average level based on criteria total effectiveness and financial capacity, the results that have been achieved for individual indicators are converted in universal units. Following the advise of the experts, the individual indicators are given equal weight when forming the level of the corresponding criteria – 0.25 for total effectiveness and 0.33 for financial capacity.

The results show that vegetable farms have the highest level under the criterion total efficiency, followed by farms with field crops. The high efficiency level achieved by farms with field crops is mainly due to the direct payments that have been received.

Farms with field crops have the highest level of financial capacity and the differences between the other farm typologies under this criterion are not significant.

The average levels under the criteria adaptability and sustainability of farms are defined on the basis of the individual levels of the surveyed farms. Vegetable farms have the highest level of adaptability, considering the seasonal character of this production. On the other hand, farms specializing in production with long-term character of investment (permanent crops, grazing livestock) have lower adaptability. The results of the achieved study point out that farms specializing in field crops and pigs and poultry have low adaptability. The rest of the farms, except for the last group, are in the medium range, regarding the level of sustainability.

After determining the average values for the individual criteria, a general integral indicator is defined – *index of general competitiveness* (Figure 23). Taking into account the experts' advise when defining the general competitiveness of farms of different typology, the individual criteria are given equal weight (0.25).

Figure 23

Index of competitiveness of agricultural farms in Bulgaria

In order to classify farms in one or another group of competitiveness, we use the scale represented in Table 16, and thus the farms are classified as having low, average and high level of competitiveness, depending on the specific significance of the index.

Table 16

Scale for the assessment of the levels of competitiveness of Farms

Index of competitiveness	Level of competitiveness
0 – 0.25	Low
0.26 – 0.74	Average
0.75 – 1	High

The integral values show that farms specializing in permanent crops have low level of competitiveness, while the rest of the groups of farms have average level of competitiveness (Table 17). Farms specializing in vegetables have relatively the highest competitiveness, followed by farms specializing in field crops. Otherwise, farms that are specialized in grazing livestock production have relatively lower level of competitiveness than cropping farms.

Table 17

Competitiveness and agricultural farms in Bulgaria

Farm typology	Index of competitiveness	Level of competitiveness
Field crops	0.50	Average
Vegetables	0.56	Average
Permanent crops	0.24	Low
Grazing livestock	0.38	Average
Pigs and poultry	0.40	Average

Conclusion

This study makes the first attempt to adequately assess and analyze the level and factors of competitiveness of agricultural farms in Bulgaria at the present stage.

The paper suggests a new approach that has significant academic and practical value. *First*, it suggests a new holistic framework for a more comprehensive analysis and assessment of competitiveness of farms as a whole and in different sub-branches. *Second*, it provides new instruments for assisting the design of farm strategy, organizational modernization and corporate actions, and also for improvement of the public policy and forms of public intervention in the agricultural sphere. Finally, it gives the opportunity for more realistic forecasting of the possible perspectives for development of the agricultural structures in the specific conditions of the different sub-branches and regions of the country.

Therefore, we should continue working for increasing the studies representation (by covering larger number of farms of specific type, specialization and/or region of the country) and also regarding the multi-annual assessments of competitiveness of the observed farm typologies (in order to estimate the dynamics of competitiveness of different types and forms of farms).

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