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FORECASTING THE PROBABILITY OF RECEIVING AND USE OF GRANTS BY FARMERS THROUGH LOGISTICAL STATISTICAL MODELS
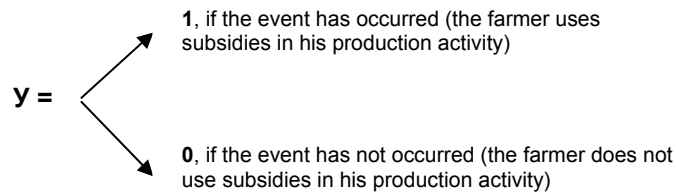
Examined are the changes that will occur in the probability of use of possible grants after direct payments for a unit of area in agriculture are available. Related to this is examined the dependence between the sought possibility and the economic size of farms trough logistical statistical modeling. On the ground of the created logistical models are drawn up plans on the expected use of grants generally to secure of means of circulation and main means of production as well as only to use them in long-term investment. Some important conclusions are made about the future behavior of farmers from the point of view of their investment activity. The more favorable structure of farms after receiving of the payments for a unit of area is the main reason for the expected bigger size of the examined possibility.

JEL: C20; Q14

It is logical to expect that with the acceptance of Bulgaria as a full member of the EU and the wide spectrum of assured opportunities for access the European funds by the different pillars and measures, the investor interest of farmers will grow. There is a prepared in the Ministry of Agriculture and Foods scheme for assisting farmers and for the maximum national payments above the direct Euro-payments per land unit in 2008. According to these estimates, every agricultural producer working his land will receive a subsidy of BGN 14-15 per dka. The enquiry into the probability for using other subsidies besides the above mentioned direct payments will clarify the future farmers' intentions related to their investment behavior. From now on, in this article wherever there is reference to forecasting the probability for using subsidies, there will be kept in mind subsidies coming from the European funds and those which will be paid from the National budget without direct payments per land unit. For achieving this aim it is especially important to use exact quantitative methods, especially logistic models.

Essentially, logistic models belong to the class of the so-called probabilistic models in which the dependant variable Y is an alternative (dichotomous) value, e.g. it can have only two different values.[1]/ For example, the use or disuse of subsidies in agricultural production is an alternative variable. Another alternative variable may refer to whether there is invested in agriculture. Usually the values of this type of variables are denoted with the numerical values of 0 and 1 while the value which denotes the happening of an event is denoted by 1 and the opposite is denoted by 0. The so-called above first variable can formally be be defined in the following way:

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[1] *Chipeva, S.* Statistical analysis of quialitive data with SPSS. Sofia: University publishing house "Stopanstvo", 2005.

$$y = \begin{cases} \textbf{1}, \text{ if the event has occurred (the farmer uses subsidies in his production activity)} \\ \\ \textbf{0}, \text{ if the event has not occurred (the farmer does not use subsidies in his production activity)} \end{cases}$$

From the formal point of view, the models in which the dependent variable is alternative are regression models. However, they can not be evaluated as simple regression models since the empiric distribution of the dependent variable belongs to the group of exponential distributions. One of the major particularities of the models with alternative dependent variable refers to the fact that explicitly instead of the very alternative dependent variable Y, in the model there appears the probability of its occurrence π = Prob{У=1} or some transformation of its. The probability У to get another value is equal to $(1-\pi)$. That is why these models are also called stochastic.

The logistic regression models describe the dependent between the probability of occurrence of a effective event expressed by a dichotomous scale and one or more factor variables. Usually they represent the enquired link as a curved regression line of the type of an S-wise curve. The common type of a single factor logistic model is expressed in the following way:

(1) $\ln(\pi/1 - \pi) = \beta_0 + \beta_1 x$,

where β_0 and β_1 are the corresponding regression coefficients.

The ratio $(\pi/1 - \pi)$ indeed expresses the ratio between the probability for success or failure of the dependent variable Y. Said otherwise, it measures what the chance of the effective event to occur as compared to its non- occurrence is. Since the logarithmic transformation in $(\pi/1 - \pi)$ in equation (1) concerning the probability for the occurrence of the effective event Y, (π), has a very unclear sensual interpretation, the logistic model is often transformed in order to show the very probability and not its logarithm. This occurs by using the exponential function. The single determinant model (1) gets the following form:

(2) $\pi = \dfrac{\exp(\beta_0 + \beta_1 x)}{1 + \exp(\beta_0 + \beta_1 x)}$

or:

(3) $(\pi/1 - \pi) = \exp(\beta_0 + \beta_1 x) = \exp^{\beta_0} * \exp^{\beta_1 * x}$

The sensual interpretation of the results of applying of such a model is already easier understandable since it explains the influence of the determinant X directly over the probability of the occurrence of the event Y and not upon its logarithm.

In our case this probability is strongly influenced by the farm size. According to the definitions adoppeted by the Agro-statistics directory at the Ministry of Agriculture and Food, the farm size is estimated in economic units and shows the potential of the corresponding farm but not its financial results. The economic size gives an opportunity for comparing farms with differing specialization when the physical size (average area, animal number, etc.) does not bring about sufficient information. The economic size of a farm is determined by dividing the total gross margin (TGR) of the farm by 1200 euro. The evaluated coefficient is accepted as an economic unit (EU) e.g. one economic unit is equal to 1200 euro.[2]/ (EU=TGR:1200). The total gross margin which is a basis for determining the farms' economic size is criterion for the farm typology of the farms in the Agricultural statistics of the EU. This criterion is applied over the individual results of the observation of the structure of the agricultural farms, while by using the share of each product in the total gross margin there are determined the specialization and economic size of each farm. According to the number of economic units the farms are classified in 10 classes. Class 1 includes the smallest farms whose size is up to 2 economic units. The last – tenth class includes farms whose economic size is over 250 economic units.

The total gross margin is an indicator which is evaluated as a difference between the Gross product and certain variable costs by types of crops and types of animals (TGM= GP-VC). The Gross product includes the following elements: Basic product, secondary products and direct subsidies. While evaluating the Gross margins there are taken in view the expenditures which can easily be referred to the corresponding crops or animal types. These are the expenditures for seeds and planting material; fertilizers and plant protection preparations; energy for plant drying, heating of greenhouses, for selling the produce transportation to the market, etc; plant and animal insurance; concentrated and rough fodder, other food, salt and mineral additives; preparations for cleaning, medicines and veterinary services. The following expenditures are not included: for labor force; fuels, rents, machine maintain and amortization; maintain and amortization of buildings; services of third persons (not including veterinary services).

In order to collect the gross margins, the Agro-statistics directory at the Ministry of Agriculture and Food there are used two basic methods: 1) by interviewing the agricultural producers and 2) by analytical estimates on the basis of the disposable information. According to the first method there are performed interviews by plant and animal types. For each interview there are developed instructions for the interviewers according to the methodology for gross margin estimation. There are used questionnaires for: basic one year crops, legumes, fruit plants and grapes; buffaloes; sheep and goats; pigs, poultry, rabbits. The gross margins for the crops and animal types which are not under supervision, and are not subject to interviews, are

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[2] Structure of the agricultural farms in Bulgaria. Ministry of Agriculture and Forestry, Agro-statistics Directory. Sofia, 2005.

determined in the second way, e.g. by help of technological cards and expertise. There are used the following data sources: data concerning the output volume of the statistics directory of the Ministry of Agriculture and from the National Statistical Institute (NSI); concerning the product prices   the Agricultural Market Information System (SAPI) concerning the prices of agricultural products; data from NSI and SAPI and the National Agricultural Advisory System concerning the determination of the direct expenses as well as technological cards concerning agricultural practices taken from scientific institutions.

After making the brief descriptions of the logistic model theoretical foundations we have applied its opportunities in looking for the dependence between the agricultural farms' economic size and the probability that the agricultural producers use subsidies in their production. The solution to this problem will allow us to answer the following question: What will be the probability farmers to use besides the direct payments per area unit also other subsidies coming from European funds and various national sources in the conditions of functioning of the Common agricultural policy?

In order to assure the necessary information when building logistic models there are used data from the agricultural farm census of 2003 also conducted by the Agro-statistics directory of the Ministry of Agriculture and Foods.[3] New, more up to date account information on agricultural farms is expected after March 2008. Presently, however we do not dispose of newer information and for that reason we are forced to use the 2003 information. The disposed of statistical information refers to 458 agricultural farms which are included in the developing accountancy information system (FADN). Three hundred seven farms have the form of agricultural cooperatives while 264 of them are specialized in the growing of field crops. In the sample there appear also 31 agricultural cooperatives of a mixed crop growing type. Hundred and thirty eight farms were functioning as physical persons while 59 of them are oriented to the growing of the field crops, 27 care of ruminating animals, etc. The Ministry of agriculture and food sample includes all size types of agricultural farms (from 1 to 10). The received in 2003 subsidies are divided accordingly in two groups: subsidies for performing current activities (working capital) and subsidies for assuring fixed capital. The ratio between the subsidies for current activities and those invested in fixed capital is 69.8:30.2 e.g. the part of the subsidies towards working capital is more than twice greater than the part designated for the acquisition of fixed capital.

Here is the place where we must mention that the used in the two directions subsidies can be treated as specific forms of investment if the investment behavior of the farmers is understood as such behavior that is treated as assurance of monetary assets for all labor conditions. In this case the notion of investment which is directly related to the investment process and activity is treated in a broader sense. Here we

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[3] Bulletin N 47 of the Agro-statistics Directory of the Ministry of Agriculture and Forestry. Sofia, 2003.

have in mind the investment of a certain amount of financial resources both for the assurance of the fixed capital (the various types of agricultural machines, agricultural buildings, technological equipment, new technologies for production, biological funds, etc.) and monetary investment for buying working capital needed for the accomplishment of the production process. As it is known, this group contains the following elements: seeds and planting material, preparations for plant and animal protection, fertilizers, irrigation water, veterinary services and other current labor assets. Despite the fact that from the essentiality point of view the investment process is treated in an enough broad sense, from its time terms and stages of investment it is related only to its final stage e.g. the inclusion of the fixed and working capital in their production consumption.[4]

As it was mentioned the probability of receiving subsidies and the investment activity of the agricultural production units directly depends on their economic size.[5] For this reason in the built up models as an independent variable (x) there is chosen the determinant number of economic units of the agricultural farms. The regression coefficients β_0 and β_1 are estimated with the help of the statistical package SPSS as follows: 1) Separately for physical persons and agricultural cooperatives of all production specializations; 2) Separately for all physical persons and agricultural cooperatives growing field crops; 3) Agricultural cooperatives of mixed plant growing type and 4) Physical persons of mixed plant growing and animal rearing specialization. Thus there is eliminated the influence of the product specialization and of farm type (physical person or agricultural cooperative) over the probability for using the various types of subsidies. Besides the calculations are prepared for the one hand total for both directions (for working assets and fixed capital) and on the other hand, only concerning investment in fixed capital. The final results from the accomplishment of the logistic module in SPSS total for all production specializations and for all types of agricultural farms are given here under.

Results from the execution of the logistic module in SPSS concerning the probability of using subsidies by all agricultural farms (physical persons and cooperatives) of all production specializations

Variable У

Beginning Block Number 0.   Initial Log Likelihood Function

-2 Log Likelihood   580,70914

Constant is included in the model.

Estimation terminated at iteration number 3 because

Log Likelihood decreased by less than 0.01 percent.

-2 Log Likelihood   552.461

Goodness of Fit   458.932

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[4] *Mihailov, M., etc.* The investment process in agriculture. Sofia: Zemizdat, 1988.

[5] *Petkov, L.* Instruments of the State policy for achieving greater invesmtent activity in Bulgarian agriculture. - Ikonomicheska misal, Sofia, 2005, N 1.

Logistical Model:

Variable	B	S.E.	df.	Sig.	Exp(B)
У	,0059	,0011	1	,0000	1,0059
Constant:	-1,2997	,1578	1	,0000	

The concrete mathematical expression of the evaluated logistic model is of the following type:

$$(\pi/1-\pi) = \exp\,(-1.2997 + 0.0059*x)$$
$$= \exp\,(-1.2997\,)*\exp\,(0.0059*x)$$

In this case the interpretation of the relation between the economic size of the agricultural farms and the probability to use subsidies will mean that in case certain farm increases its size by one economic unit, the indicated probability will increase 1.0059 times. In practice this means that the chance of using subsidies will rise by 0.59% when the economic size grows by one unit. For example the chance a farm of 5 economic units to use subsidies is 0.28 e.g. the probability that it uses subsidies compared to the probability it does not use subsidies is approximately 1:4.

There are results of a similar type for each farm type depending on the basic product specializations. In order to avoid certain repetitions in this article, they are not published in their authentic form. For greater clarity, on the grounds of statistical results there are estimated the ratio $(\pi/1-\pi)$ and the probability concerning the current and the basic activity as well as the probability only for using fixed production capital subsidies. These calculations are performed by groups of agricultural farms and by basic product specializations. They allow that at every change in the economic size determined by various determinants to estimate the possible probability of using subsidies in the future. Thus there can be formed different versions depending on the ways and assets for increasing the economic size. As it was already mentioned by the present moment, in the Ministry pf agriculture the determined size of direct subsidies per land unit will amount to 14-15 BGN per dka.

Having in mind the definition of the economic size of the agricultural farms this means that depending on the used by them agricultural area their size will grow under the influence of these payments even at the same other conditions. Under this scenario of increasing the economic size of agricultural farms there will also be certain changes in the probability that the farmers will use subsidies under the other pillars and measures for developing agriculture and rural regions. The period of forecasting of the subsidies in the sense used in the beginning of this article refers to the time when there are used subsidies according to the Unique scheme of direct payments per unit of used agricultural land. Presently it is known that the payment of these subsidies will start at the end of 2007 and will continue till June 2008.

The calculated changes in the degree of the treated probability as compared to before the direct payments per area unit are given in tables in the following sequence: 1) Agricultural farms from all production types; 2) Agricultural farms growing field crops; 3) Agricultural farms with mixed crops; 4) Agricultural farms of mixed crop growing and animal rearing type.

The analysis of the data given in table 1 shows the following: the probability for receiving subsidies for assuring working capital and for mixed capital for both types of agricultural farms increases after they receive the direct payments of 14 BGN per dka.

In the case of the physical persons this increase is from 37.8% to 41.4% (e.g. by 9.5 percent) and regarding the cooperatives it is from 31.6% to 67.2% or more than twice.

Table 1

Changes of the Level of the Probability of Using of Subsidies for Working and for Fixed Capital after the Direct Payments in the Structure of the Agricultural Farms of all Product Specializations (%)

Farm types	Total subsidies for current activity and for fixed capital				Subsidies only for fixed capital		
	Total:	Including			Total	Including	
		Up to 5 class	*6-8 class*	*9-10 class*		*Up to 8 class*	*9-10 class*
1. Physical persons Probability before the direct payments (%)	37.8	32.4	39.4	77.8	1.6	1.0	7.4
Share of physical persons (%)	100.0	71.0	20.3	8.7	100.0	91.3	8.7
Probability after the direct payments (%)	41.4	32.4	37.5	91.3	2.6	1.0	14.5
Share of physical persons (%)	100.0	60.6	27.7	11.7	100.0	88.0	12.0
2. Agricultural cooperatives Probability before the direct payments (%)	31.6	11.5	16.7	47.4	3.3	0.00	6.5
Share of agricultural cooperatives (%)	100.0	8.5	41.4	50.1	100.0	49.8	50.2
Probability after the direct payments. (%)	67.2	11.5	16.0	90.0	67.9	0.00	98.1
Share of agricultural cooperatives (%)	100.0	2.6	28.0	69.4	100.0	30.8	69.2

The major reason for the increased probability relates to the better farm structure from the point of view of their size. In the case of the physical persons

before receiving direct payments, there dominate the farms whose size is up to 12 economic units (71%). They are followed by the farms whose size is between 12 and 100 economic units (20.3%) and the scope of the farms whose size is above 100 economic units amounts only to 8.7%. After the payments, this ratio will change as follows: 60.6%:27.7%:11.7%.

In the case of the agricultural cooperatives the structural changes are even greater as a result of which the chance for receiving subsidies is drastically greater than that of the physical persons. The dominating part of theirs (nearly 70.0%) will be with an economic size over 100 economic units and only 2.6% will have the size less or equal to 12 economic units. Before the payments this ratio is 50%:8.5%. The more favorable structure of the farms during the new period favors the greater probability for getting subsidies since the agricultural farmers' behavior in this regard varies with the size of the farms. It is evident and totally explainable that the greatest inclination of receiving subsidies is expressed by the farmers of the greatest economic units (those whose size is over 100 economic units).

The increase of the chance of getting subsidies for investing in fixed capital by the agricultural cooperatives is even greater. In their case the probability has increased from 3.3% to 67.9%, e.g. 20 times. In the case of the physical persons although the probability to use only investment subsidies has also increased (from 7.4% to 14.5% for those which are over 100 economic units), as a whole it is very much lower (only 2.6%). This result is due to the weak presence of the large farms with a size of over 100 economic units even after the direct payments (their share will reach only 12%), and the greater inclination and motivation towards long term investment is characteristic of them.

In the case of the agricultural farms growing field crops the trends are similar to those which are mentioned concerning the farms of all product specializations (see Table 2). This is quite logical having in mind that they occupy a significant part of all farms (their share amounts to 86%).

In the case of the agricultural cooperatives the probability for using subsidies for current activities and for investment in fixed funds has increased 2.2 times and concerning physical persons it rises by 21.7%. In this case also the main reason for the expected changes refers to the improved farm structure from the point of view of their economic size. After the direct payments the share of the biggest cooperatives (over 100 economic units) will reach 68.8% e.g. 2/3 of all agricultural cooperatives raising field crops. In the case of the physical persons this share is much smaller as compared to the cooperatives, but in spite of this it rises from 19.3% to 28.0% which itself influences the probability level for using subsidies. In itself the more favorable structure of agricultural cooperatives after the direct payments is due to the fact that the average size of the land planted with field crops per cooperative is 1892 ha while in the case of the physical persons it amounts to 897.5 ha.

Table 2

Changes of the Probability Level for Using Subsidies for Assuring Working and Fixed Capital after the Direct Payments and of the Structure of the Farms Planting Field Crops (%)

Farm types	Total subsidies for current activity and for fixed capital				Subsidies only for fixed capital		
	Total:	Including			Total	Including	
		Up to 5 class	*6-8 class*	*9-10 class*		*Up to 8 class*	*9-10 class*
1. Physical persons Probability before the direct payments (%)	43.3	30.5	38.3	82.1	3.4	2.9	5.7
Share of physical persons (%)	100.0	42.1	38.6	19.3	100.0	80.7	19.3
Probability after the direct payments (%)	52.7	30.1	38.3	95.2	3.9	2.9	6.5
Share of physical persons (%)	100.0	31.6	40.4	28.0	100.0	71.9	28.1
2. Agricultural cooperatives Probability before the direct payments (%)	31.8	11.5	16.7	49.7	3.8	0.3	8.2
Share of agricultural cooperatives (%)	100.0	9.1	43.6	47.3	100.0	52.8	47.2
Probability after the direct payments. (%)	68.6	11.5	16.7	92.4	67.5	0.3	98.0
Share of agricultural cooperatives (%)	100.0	3.4	27.8	68.8	100.0	31.2	68.8

The differences in the structure between the economic sizes of the two types of farms also reflects over the degree of the probability for using subsidies for long term investment. While in the case of agricultural cooperatives the chances for investing in fixed capital has increased from 3.8% to 67.5% (e.g. nearly 18 times), in the case of physical persons this increase is symbolic, e.g. from 3.8% to 3.9%. Concerning both types of farms the average probability increases totally due to its increase in the cases of the very large farms, while in the case of farms with an economic size of up to 100 economic units it practically remains the same. Besides, we would like to additionally point out that while calculating the probability for using subsidies with an investment purpose the farms of a size of up to 100 economic units almost have no difference and that is why they are united in one group.

The whole sample also includes physical persons who take care of only ruminating or only non-ruminating animals. They are not subject to separate discussion in the present article but are included in the case when the farms cover all product specializations. For this reason the calculated probabilities for individuals from all production specializations do not follow the size of the probabilities concerning physical

persons growing field crops. This conclusion is valid both regarding the expected probability of using subsidies for on-going activities and regarding the subsidies destined for long term investment.

The probability of using subsidies for current activities in the case of the farms with mixed plant growing specialization also increases during the period when the Scheme for unique payment per area unit will be enforced as compared to the period before the direct payments (table 3).

These farms are represented only by agricultural cooperatives. The used by them subsidies till 2003 have been destined only for on-going activities. None of these subsidies have been spent for fixed capital.

Table 3

Changes in the Probability Level for Using Subsidies for Working and Fixed Capital after the Direct Payments and in the Structure of Agricultural Farms with Mixed Plant Growing and with Mixed Plant Growing and Animal Rearing Specialization
(%)

Farm types	Mixed plant growing specialization				Mixed plant growing and animal rearing specialization		
	Subsidies for on-going activities				Subsidies for on-going activities		
	Total	Including:			Total	Including:	
		7-8 class	9 class	10 class		Up to 6 class	7-8 class
1. Agricultural cooperatives Probability before direct payments (%)	33.1	6.5	28.6	52.8	None	None	None
Share of agricultural cooperatives (%)	100.0	17.2	48.3	34.5	None	None	None
Probability after direct payments (%)	77.2	9.1	44.4	95.6	None	None	None
Share of agricultural cooperatives (%)	100.0	17.2	6.9	75.9	None	None	None
2. Physical persons Probability before direct payments (%)	None	None	None	None	61.0	55.6	82.7
Share of physical persons (%)	None	None	None	None	100.0	80.0	20.0
Probability after direct payments (%)	None	None	None	None	66.5	58.0	86.4
Share of physical persons (%)	None	None	None	None	100.0	70.0	30.0

Table 3 shows a gradual growth in the probability in the period before the direct payments have come to force by 33.1% for the group including cooperatives which

includes cooperatives with a size of up to 100 economic units (accordingly up to 8th class) to 52.8% for the group of cooperatives whose size exceeds 250 economic units (10th grade). Analogically to this trend it is expected that after 2007 the probability concerning cooperatives sized up to 100 economic units to increase to 77.2%, and for the greater cooperatives the probability will rise from 52.8% to 95.6%. For practical purposes, concerning the last group after receiving the direct payments the ratio between the chance of using subsidies to the chance of not using them is approximately 22:1.

In the case of the physical persons from the mixed plant growing-animal rearing specialization the changes of their economic size and in the structure accordingly are weak. This is explainable by the small average size of the used by these farms land (58.7 ha). The greatest farms in this case are with the size of up to 100 economic units. In fact there lack physical persons who function as farms whose size exceeds 100 economic units. This evidently has influenced the slight increase of the probability of using subsidies with the purpose of satisfying of current needs even for the large farms (from 82.7% to 86.4%). In spite of this we must mention that this probability is quite high. In these farms no part of the used till 2003 subsidies is used for the purposes of long term investment.

From the performed survey there can be made several more general conclusions:

1. The direct payments per unit of area will not have an uniform influence over the various types and of different specialization farms from the point of view of the changes of their economic size. After receiving them the structural changes will occur in the large farms which in their greater part are agricultural cooperatives. In the case of the physical persons this is most characteristic for those caring for field crops.

2. As a result of the differing degree of change in the structure of agricultural farms in the direction for its perfection regarding the cooperatives and the physical persons there differ the changes in the probability level for using the subsidies.

3. After 2007 the probability of using subsidies by the agricultural cooperatives will increase as a result of the payments they receive according to the scheme of unique payment per unit of used agricultural land.

4. To the greatest degree the conclusion made above is valid for the cooperatives whose economic size is over 100 economic units. In them in practice the studied probability has reached its maximum and any further increase in their size will contribute to increasing the average probability for the cooperatives.

5. The increase of the chances for long term investment in the case of the cooperatives by future subsidies is considerably higher with the increase increase of subsidies with the purpose of assuring the performance of current activities.

6. The made up to here conclusions refer both to the agricultural cooperatives and to cooperatives of mixed crop raising.

7. The physical persons growing field crops will increase to a greater degree their chances of using subsidies in order to assure working capital than their chances of subsidization linked to long term purposes.

8. The farms with mixed crop raising and animal rearing specialization will be in the least favorable condition since they have little or none land and will not receive considerable subsidies. In them the efficiency of the direct per unit of area payments is almost null which reflects an over almost unchanging probability for using subsidies.

9. The above stated conclusion is valid concerning all small farms which have not the necessary minimum of land [6]/(their share amounts to 73.4%) or have land a little bit over this minimum (up to 2 ha) whose scope is about 22%. This means that the households in the first group of farms will not be able to benefit from the subsidies under review and the second farm group will only slightly feel these subsidies.

10. It is evident that these farms must definitely look for ways of their increase in order to find ways for increasing their market orientation and financial stability. Besides it is necessary to seek additional opportunities for their support through fullest use of the other measures provided by the Euro-funds. This will definitely help overcome the further increase of the economic differentiation in the Bulgarian agriculture.

Again we must mention that everywhere in this article wherever it is spoken of a probability the subsidies to be used it concerns those subsidies which are out of the direct payments according to the Unique scheme of payments per area unit. Moreover, we suppose that these direct payments will start to be paid at the end of 2007 by the developed by the Ministry of Agriculture procedure and on these grounds there must be studied the changes in the probability of using other possible subsidies.

In conclusion, we will point out that the changes in the studied probability which are expected to happen as a result to occur as a result of the changes in the economic size of the farms can be studied from the point of view of other determinants such as for example the farmer's age, his education or purely economic indicators such as Net income, Gross value added, etc. Besides, for this purpose there can be used both single factor logistic models as well as multifactor logistic models with several determinants.

21.V.2007

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[6] *Valchev, N., L. Petkov*. The investments in the Bulgarian agriculture, Sofia: Academic Marin Drinov publishing house, 2006.