SUMMARY

Of the Doctoral Dissertation

"STUDY CONCERNING THE STRUCTURAL IMPROVEMENT OF THE ROMANIAN AGRICULTURE IN ORDER TO INCREASE IT'S PERFORMANCE"

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Key words: agriculture, performance, technical efficiency, allocative efficiency, economic efficiency costs, total factor productivity (TFP), determinant factors, structural agricultural models, models of regional agricultural, agricultural profile.

The purpose of the present doctoral dissertation is to identify solutions in improving the Romanian agriculture structure, that can ensure the increasing performance and growing the total productivity of the production factors. The solutions pursued by the made researches were followed to create a viable methodology for the evaluation of the structural exchanges and agriculture performance. The intervention measures on the structure elements purpose were fundamented by methods and econometric functions that allowed the structural characteristic relations at the regional and micro-regional level with the levels of performance achieved by Romanian agriculture.

The main objectives studied in this thesis are: the delimitation of main concepts and research on the evaluation performance of agriculture; assessing structural characteristics of the Romanian agriculture from the censuses of 2007 and 2013; quantifying the performance of agriculture to structural models through efficiency indicators (technical, allocative and economic) and total factor productivity index of production; estimate factors influencing agriculture performance measured in terms of productivity of factors of production and the structural improvement measures needed improvement.

Chapter 1, entitled "**CURRENT STATE OF THE RESEARCHES CONCERNING THE EVALUATION OF THE STRUCTURAL CHANGES AND PERFORMANCE IN AGRICULTURE**" had, predominantly, a theoretical character, and the analysis was oriented to: highlighting the approach in the dedicated literature of the structural changes concept regarding the agriculture sector; presenting the specific elements of the structural changes in agriculture; the approach and evaluation of the productivity in agriculture. The bibliography addresses concepts like structural changes and productivity, in a chronological manner, highlighting the main conclusions and the obtained results in the representative references for this thesis.

In the Chapter 2, entitled '**THE RESEARCH METHODOLOGY OF AGRICULTURE PERFORMANCES IN THE STRUCTURAL CONTEXT**", I underline the goal of research, the stages and the objectives and methods used. Resuming, the methods used in researches were: exploratory multivariate techniques (implemented using IBM SPSS 20 software demo version) - factor analysis (principal components analysis) and group analysis (cluster analysis); DEA method (data analysis winding) for calculating technical efficiency, allocative and economic model DEA Malmquist - model for calculating the TFP index (applied using DEAP program); econometric methods - multifactor regression models (applied using MS Office Excel Data Analysis); Multiple linear regression models (multiplicative models similar overall shape of the Cobb-Douglas function) (applied using MS Office Excel Data Analysis).

Methodological approaches, as noted, were complex, aiming to identify and classify the micro-regional and regional agricultural models structural features and performance solutions for agriculture and provide orientation restructuring measures. They were consistent with current approaches in the literature to measure the performance of agriculture through efficiency indicators (technical, allocative and costs) and total factor productivity index.

Chapter 3, entitled "**STRUCTURAL ANALYSIS OF THE ROMANIAN AGRICULTURE CONSIDERING THE TERRITORIAL PROFILE (2007-2013)**" includes the structural analysis of the following elements: the utilized agricultural area, the vegetal production, the animal production, the agricultural exploitation and their intensity. The analysis aimed the highlighting of: the way the agricultural activities were made, according to the evaluation of the utilized agricultural area structure (UAA) and the property; the localization and

the typology of vegetal production evaluating it's structure; the localization and the typology of animal production, evaluating it's structure; the economic performance of the agriculture, evaluating the agricultural exploitation sector; the typology of the practiced agriculture by evaluating the level of mechanization and the manner the chemical fertilizers, the fungicides, the herbicides and pesticides are utilized.

Chapter 4, entitled '**THE IDENTIFICATION OF STRUCTURAL AGRICULTURE PATTERNS THAT CHARACTERIZE ROMANIAN AGRICULTURE DURING 2007-2013**' aims to identify groups with similar structural characteristic (clusters) to assess their evaluation and design performance. Factor analysis allowed the identification of variables that characterize the Romanian agricultural model in 2007-2013. Thus, in Romanian agriculture, from 18 structural variables, were identified four factors: First Factor - specific variables loaded from vegetable and animal farm size (especially the average size), but also share commercial farms (over 50 ha); Second factor structure- specific variables saturated plant and animal production (share value vegetable production) and from those of the use of OR; Factor 3 and 4 - saturated by specific variables - vegetable and animal sector (swine).

The hierarchical classification (hierarchical cluster) and k-means clustering method led to the identification of 10 models at the local level agricultural structural and 7 regional structural models. They were ranked according to importance by generating composite indicators based on scores generated by factor analysis.

Chapter 5, entitled "**THE PERFORMANCE EVALUATION OF THE IDENTIFIED STRUCTURAL MODELS**" aimed the comparative evaluation of the agriculture performance, considering the identified structural models, using the total factor productivity index (TFP) which is based on the borders of production constructed by Data Envelopment Analysis (DEA). The variables taken into consideration were: inputs- labor (AWU- annual work units), land (UAA- utilized agricultural area) and capital (euro); outputs- production value (euro) and profit (euro). Also, in order to evaluate the production efficiency (allocative efficiency, cost and economic efficiency), the average costs of the used inputs were calculated (labor, land and capital).

Researches has revealed that in 2007-2013 period, the structural agriculture models,

overall, were more inefficient in 2013 when talking about the economic aspect than in 2007, primarily due to allocative inefficiency, i.e. incorrect mix of inputs. When talking about the structural models, there weren't major changes; the input-output ratio has changed on a small scale; the inefficient combining of resources has led to low levels of the factors of production index. However, it was noticed an evident progress and productivity growth in the Romanian agriculture. This emphasizes us that our inputs remain high in comparison with the obtained outputs and that show real problems in cost-control and income maximization assurance.

Chapter 6, entitled "**THE CORRELATIONS ESTIMATION BETWEEN STRUCTURAL AND PRODUCTIVITY FEATURES OF THE AGRICULTURE**" aimed at identifying the structural elements involving changes to agricultural productivity, regarding structural agricultural manners and the development areas. The analysis aimed to establish: the correlation between the evolution of agricultural productivity within structural agricultural patterns and the productivity trend within regional agricultural models; the correlation between the level of structural development and the main of the agricultural models productivity evolution; the influence of production factors and productivity development.

Researches regarding regional structural patterns have allowed the identification of counties that represent economic enhancement poles and it also highlighted the variable's effect of the agricultural exploitations dimension and af the regional structural development level of the productivity. Also, researches regarding structural agricultural patterns highlighted the influence of the utilized agricultural area structure productivity development.

Chapter 7, entitled "**QUANTIFYING INFLUENCE OF THE MAIN STRUCTURAL VARIABLES AND THE IDENTIFYING THE SOLUTION FOR PRODUCTIVITY FACTORS GROWTH**", aimed the influence quantification of the structural variables on productivity and finding the needed solutions for productivity growth. Researches highlighted correlations between variables and total productivity of the factors and facilitated elasticity estimations on variables in relation to TFP variation, based on multiple linear regression models.

The existent researches has shown that at the level of structural agricultural models, the growth productivity is influenced especially by the weight of surface owned by the agricultural units and in particular by the weight of the vegetal production value, and at the level of regional

agricultural models, the productivity growth is directly influenced (in a positive way) by the exploitations weight off 50-100 ha and in a negative way by cattle exploitation dimension.

Given the conditions there have been identified TFP growth levels, considering that the following elements changed with a unit: increasing the vegetal production weight; increasing the weight of the owned are by the agricultural units; attenuation of the labor input for every exploitation; increasing the dimension of agricultural exploitations; increasing exploitation weight with up to 100 ha.

Chapter 8, entitled "**CONCLUSIONS AND SUGGESTIONS**" summarizes different aspects of existent researches and suggested solutions for increasing performance in agriculture.

INTRODUCTION

The structural changes in agriculture in recent decades can be identified in the most European countries. These phenomena have emerged amid almost general decrease in the number of farms, of increasing specialization, the decline in employment population in agriculture, and the fall in the share of agriculture in national economies. In this context, structural change in agriculture approaches were multiple, studies focusing on exploring demographic and economic characteristics of farm production, methods applied, the resources used, etc. Thus, the various dimensions of structural changes were incorporated into the exploratory models that take into account the physical and economic size of farms, the volume of agricultural activities, utilization of productive resources etc.

Romanian agriculture was also faced with these phenomena resulting from structural change: increasing and decreasing fallow farmland irrigated areas; decline in livestock; agricultural population decline and an aging rural population; low level of processing of agricultural products and the ability to create added value; low level of capital employed in agriculture, etc. Low technological performance, fluctuating and unstable dependence is due to the influence of climate change, energy and outdated technologies and productive. It also is affected by the land structure, characterized by fragmentation of agricultural land and the predominance of small farms. This has caused many farms to remain unfunded (approx. 70% of farms owning less than 1 ha), while approx. 27% of farms remain subsistence and semi-subsistence (under 5 ha), producing mainly for self-consumption. The current agrarian structure thus proves ineffective in terms of, in particular, resource allocation and becomes an element that hampers economic growth.

In this context, the doctoral thesis entitled "Study concerning the structural improvement of the Romanian agriculture in order to increase its performance" aimed at identifying solutions to improve the structure of Romanian agriculture, to ensure increased performance of Romanian agriculture or increase total productivity production factors.

To meet the purpose mentioned in this thesis, we proposed to evaluate the results of research conducted in the field of structural change and productivity in agriculture, to establish

structural variables that characterize the Romanian agriculture, to identify determinants that characterize Romanian agricultural, to identify structural models with similar characteristics, to quantify the performance of agriculture and structural variables that are leading to an increase in total factor productivity at models designed level.

This paper aims to provide a viable methodology for assessing performance of Romanian agriculture that can allow, by scientifically methods, to identify structural elements that need to be supported by agricultural policies and sectoral measures.

In closing, I want to thank the scientific leader, d's Univ. Dr. Ion Dona, for the support and guidance provided throughout the period of development of the doctoral thesis.

CONCLUSIONS AND PROPOSALS

Structural changes, including those at European level, resulting from changes in the number of employed people in agricultural activities, changes in number of farms and their size, increasing the size of non-agricultural sector, subsidy policies etc. Specialty literature has identified other determinants of structural changes, such as: national regulations on land mobility, social policies designed to protect the rural population, poor national policies to support the development of technological, economic or social, etc. Add to this the changes in technology, economic and institutional change in agriculture that lead to limits between economic sectors (agriculture, industry and services), which offers a flexible character patterns of production and distribution of agricultural products. In other words, changing the share of agriculture in the economy affect the formation agro-food sector, demand for food, agricultural resource availability, etc.

In the context of the mentioned structural changes, the related literature revealed changes at the level of productivity too. Most studies have shown that, although there has been an increase in all productivity factors, it had a slower pace in the last decades, because of the way resources was used, the diminution of research- development- innovation costs and the diminution of the human resource in agriculture.

The aim of this doctoral thesis was to identify solutions for improving the structure of Romanian agriculture to ensure the Romanian agriculture performance growth, in other words total productivity increase of the production factors. The intervention measures about the proposed structural element were based on economic methods and functions that enable networking between the structural characteristics at the micro-regional and regional level with the actual levels of the Romanian agriculture. Hereby, researches aimed to create a viable methodology to assess the relationship between structural changes and the performance of the agriculture.

In order to meet the mentioned purpose in this thesis we focused on the following objectives: delimiting the main concepts and researches regarding the agricultural performance

evaluation; assessing structural characteristics of the Romanian agriculture starting from agricultural censuses of 2007 and 2013; using statistic methods in order to identify structural models that characterized the Romanian agriculture between 2007 and 2013; quantifying the agricultural performance at the structural methods level using efficiency indicators (technical, allocative and economic) and by using the total productivity of production factors index; estimating the factors influencing agriculture performance measured in terms of productivity of production factors and of the needed structural performance measures for it's improvement.

The complex statistical approach we are proposing aims to identify and classify micro-regional and regional agricultural features according to structural characteristics and the performance of agriculture and to provide orientation restructuring solutions.

The used research methods in this thesis are in concordance with current approaches in the special literature regarding agricultural performance assessment using efficiency indicators (technical, allocative and costs) and the index of total factors productivity: statistical methods of research (quantitative data collecting and processing which are specific for the agriculture's structure) and evaluation methods (quantitative and qualitative determination, using deduction, induction, comparison and statistical calculations); economic methods (regression models, Cobb-Douglas function) and non-parametric (DEA- data envelopment analysis, TFP- total factor productivity).

The agricultural performance depends on structural changes regarding the utilized agricultural area, vegetal and animal agricultural productivity, the agricultural exploitation dimension and the agricultural intensity degree. Structural changes that have occurred in 2007-2013 period can be summarized as:

- The SAU structure- in 2013, the weight of the areas that have been worked by agricultural units varied between 15,48% (Maramures county) and 77,32% (Calarasi county), while the SAU weight of the lease area achieved up to 50% heights in south-east Romania counties; in 2007-2013 the accretion on leased areas weight has been registered in the many counties (except Neamt and Gorj counties), identifying in Romania a growth around 11 %;
- The vegetal production structure- in 2013 the UAA has been cultivated in this proportion: 40% with cereals for grist, 9,7% with industrial plants and with 5,4% with fodder plants; in 2007-2013 period the weight of the cereals has been developed with 2,98%, with

increases of over 5% in Constanta, Calarasi, Alba, Tulcea, Braila and Ialomita counties;

- The animal production structure- in 2013 the real number of animals was made of 30,1% cattle, 20,4% swine, and 20,6% ovine and caprine; in 2007-2013 period the UVM number has been reduced with up to 16%, the weight of the cattle has been reduced with 8,25% and there was an ovine and caprine weight increase;
- Agricultural exploitations dimension – in 2013 the agricultural exploitations had an average dimension which varied between 1,53 he/ exploitation in Prahova county and 12,08 ha/ exploitation in Constanta (3,6 ha/ exploitation), the exploitations weight was higher in south-western and eastern Romanian Plain, in Transylvania and Western Plain; in 2007- 2013 period the average dimension has increased with 2,9% especially because of the exploitations number allowance, with slight increases recorded in Bistrita-Nasaud, Gorj, Calarasi, Arges, Maramures and Dambovita; in the analyzed period the weight of commercial exploitations, for more than 5 ha in all the counties also registered a slight increase in subsistence and semi-subsistence exploitations in 8 counties like Maramures, Dambovita, Arges etc.;
- Intensity degree- in 2013 chemical fertilizer application at the local level variated between 27 kg 100% active ingredient/ ha (Bistrita-Nasaud county) and 600 kg 100% active ingredient/ ha (Giurgiu county); in 2007-2013 period, the amount of fertilizer applied per ha increased by approx.. 31.44%, finding both a tendency to reduce chemical fertilizer applied per ha (approx.. 40%) in counties like Hunedoara, Timis and Brasov, and a process of enhancing their application in counties such as Cluj, Vaslui, Vrancea, Neamt, Covasna and Giurgiu; in 2013 tractor load was very high in counties whose territory includes Romanian Plain and in Dobrogea (low degree of mechanization) and in half of the counties endowment is less than 2 tractors per 100 ha.

Starting from the previously identified determinants, there were identified structural patterns that characterize the whole Romanian agriculture. Factor analysis performed by applying PCA – Principal Components Analysis enabled us to conclude that Romanian agricultural model remained almost unchanged in 2007-2013 period.

At the Romanian agriculture level, starting with 18 structural variables, there were identified 4 determinants: the most important factor is characterized by specific variables

regarding the dimension of vegetable and animal agricultural exploitations (especially the medium size), but also by the weight of the commercial exploitations (up to 50 ha); the second component is saturated with specific variables regarding the structure of vegetable and animal production (share value vegetable production) and by those characterizing the utilization way of the SAU; the other two components are saturated with specific variables for the structure of the vegetable and animal (swine) sector.

Cluster analysis (Hierarchical Cluster and K-means cluster) allowed us to identify, based on these determinants, 10 agricultural structural models. The calculating method of the composite indicators (aggregate indicator, calculated based on saturation factors) has allowed us to classify these models depending on the structural characteristics of agriculture, first hovering Cluster 7 (Constanta and Tulcea counties) and the last Cluster 2 (Dambovita county).

- M I - Cluster 7 - Constanţa and Tulcea;
- M II - Cluster 10 - Timiş;
- M III - Cluster 8 - Brăila;
- M IV - Cluster 1 - Călăraşi and Ialomiţa;
- M V - Cluster 9 - Arad, Braşov, Sibiu;
- M VI - Cluster 4 - Buzău, Dolj, Galaţi, Iaşi, Vaslui, Vrancea;
- M VII - Cluster 3 - Argeş, Giurgiu, Gorj, Mehedinţi, Olt, Prahova, Teleorman and Vâlcea;
- M VIII - Cluster 6 - Bacău, Bihor, Botoşani, Mureş, Neamţ, Satu-Mare, Suceava;
- M IX - Cluster 5 - Alba, Bistriţa-Năsăud, Caraş-Severin, Cluj, Covasna, Harghita, Hunedoara, Maramureş, Sălaj;
- M X - Cluster 2 - Dâmboviţa.

Also, the calculated composit indicators in the developing areas, allowed us to classify them according to the development degree of the agriculture, as follows: South-East; West; South- Munenia, Center; North- West; South-West; North-East.

The agricultural performance evaluation at the level of the structural agricultural patterns and identified agricultural regional patterns was achieved by the Total Factor productivity index-TFP, which is based on the Data Envelopment Analysis method- DEA. The agricultural

performance evaluation was achieved by starting from the collected data in 2007-2013 supplied by NAAD (The Network for Agricultural ant Accountancy Data), at farm level adjusted in accordance with the composition of clusters. The variables taken into consideration were: inputs - labor (AWU- annual work units), earth (ha- UAA) and capital (euro); outputs- production value (euro) and profit (euro); input prices (rent, salaries and amortization).

I) The main conclusions drawn from the agriculture structural models can be summarized as follows:

1) Technical efficiency

Evaluation of technical efficiency by DEA, revealed us that agricultural structural models ought to obtain the levels of input from 2007 by almost 8% more revenue, while evaluating deviations highlighted that structural models ineffective generally have an excess in physical size, but also in labor input and capital investment is not reflected in the size of revenues. The most efficient clusters, in technically, were M-VII, M-VIII and M-IX (operated at optimal scale). In 2013, most clusters have functioned optimally, except M-IV and M-X, which showed a surplus of capital that was not reflected in results (they would have obtained a higher profit per farm - approx. 5-6%) and M-VI and M-VIII showing a surplus of labor not reflected in economic results. The technically inefficient were M-X and M-IV.

2) Allocative efficiency and economic efficiency costs

In 2007, while the allocative inefficiency was between 43.3% and 0%, with an average of 11.1%, and technically inefficiency between 37.8% and 0%, with an average of 7.8%, we can say that the main source of economic inefficiency was the allocative costs. Moreover, the models M-II and M-V, inefficient allocative, were oversized land and capital inputs relative to revenues, so there has been an optimal combination of inputs. Another important aspect is that the prevailing level of over 82% of economic efficiency suggests that the models M-I, M-III, M-VI, M-VII and especially M-VIII, had a productive agriculture, at a cost close for the minimum level of technology in 2007.

In 2013, while the allocative inefficiency was between 29.9% and 0%, with an average of 18.1%, and technical inefficiency was between 2.9% and 0%, with an average of 1.6%, we can say that the main source of economic inefficiency was the allocative costs. We can also say

that the models M-VI and M-X were very inefficient in terms of cost, while clusters M-II, M-V, M-VI, M-VIII and M-IX had an easier productive farming, at a cost that exceeded the minimum with approx. 15-20% for the level of technology in 2013.

In 2007-2013 period, agriculture structural models were economically inefficient overall in 2013 than in 2007, especially because allocative inefficiency - incorrect mix of inputs. The main conclusions are:

- M-I and M-III become very efficient technically, allocative and economic compared to other structural agriculture models;
- M-II and M-V have improved the efficiency of technical, allocative and economic;
- M-VII, although with an optim input-output ratio, showed inefficiency of the combination of inputs that led to decline in cost efficiency;
- M-VI, M-IX, M-IV and M-X, although with a more effective input-output ratio, presents an inefficiency of a combination of inputs that led to decline in cost efficiency;
- M-VIII knew, compared with other regions, a major deterioration of technical efficiency, allocative and economic.

3) Total factor productivity (TFP)

At structural agriculture models the effect of 'catching-up' (change of technical efficiency that captures TFP growth due to changes form the border production) was just (+0.6%), which allowed us to conclude that there is a very slight convergence towards best practice, namely the optimum. TFP growth has been linked especially with technological change (+10/4%), i.e. improvements in technological change (managerial effectiveness - the ability to optimize input-output ration) rather than the catch-up effect (economies of scale)

Changes in 2007-2013 have not been major, input-output ratio changing very little. Analysis revealed that allocative efficiency, i.e. how inputs combine, it had a major influence in ensuring productivity, while the inefficiency of combination of resources has led to reduced levels of productivity of factors of production index. It has also been observed that the ordering of the models according to the development zone has not been reflected in the productivity indexes. On the table was M-II with a productivity increase of 19.7%, followed by several models with similar productivity indexes (approx. 13%), respectively: M-IV, M-I, M-III, M-X

and M-V. In the last place is the most inefficient model M-VIII.

We can say the following:

- Use of inputs has been ineffective in M-VIII, with effect directly on the low level of productivity;
- M-VII, M-IX and M-VI showed major deficiencies on ensuring agriculture productivity from the current technology (inputs and outputs);
- M-II and M-X showed a positive trend, characterized by a real effect of technological change and the catching-up of agriculture structural models developed;
- Major changes in productivity M-I (CT, TL), M-III (BR) and M-V (AR, BV, SB) until 2010 after which dynamic was very low.

II) The main conclusions drawn from the regional agricultural models can be summarized as follows:

1) Technic efficiency

Evaluation of technical efficiency by DEA revealed that patterns of regional agricultural ought to obtain the levels of input in 2007 with almost 14% more revenue, while evaluating deviations highlighted that structural ineffective models generally have an excess in physical size and in labor input that was not reflected in earnings. The most efficient regions were technically Center, North West and South West who operated at optimal scale. In 2013, Center, North West and South West regions still functioned optimally, while South East and West regions filled the gaps to optimum ranges and these boundary of production. Technical efficiency average in 2013 was 99.2%, i.e. regions could get those outputs with 0.8% fewer inputs. The most inefficient regions were technically South and North East.

2) Allocative efficiency and economic efficiency costs

In 2007, while the allocative efficiency was between 32.5% and 0%, with an average of 13.9% and technical inefficiency it was between 37.8% and 0% with an average of 14.0%, we can say that the main source of inefficiency was the technical costs. The analysis also it highlighted that in South, Southeast and Northeast regions were oversized inputs of labor and land relative to revenues, while in the West region the combination of inputs resulted in the lowest economic efficiency allowed us to conclude that regions except South and West had a

productive agriculture at a cost close to the minimum level of technology in 2007

In 2013, while the allocative inefficiency was between 31.8% and 0%, with an average of 18.4%, and technical inefficiency was between 2.9% and 0%, with an average of 0.8%, we can say that the main source of economic inefficiency was the allocative costs. Also, we can say that, except South, the regions had a productive agriculture at a cost close to the minimum level of technology in 2013.

3) Total factor productivity (TFP)

The index of total factor productivity in agriculture increased in 2007-2013 by 9.6%, and the effect of 'catching-up' which was (+2.6%), shows that the higher TFP due to the change shape of border production and show us that there is a convergence towards best practice, namely the optimum. In these circumstances, we conclude that productivity growth was likely generated by technological change improvements (managerial effectiveness - the ability to optimize input-output ratio) than the catch-up effect (economies of scale).

The 2007-2013 changes have not been major, the border effect (managerial efficiency of input-output relation) being suppressed by the effect of 'catching-up' amid increasing economies of scale (increasing the size of farm activities). The analysis allowed us to conclude that in 2007-2013 period, there was an evident progress and productivity growth in agriculture in Romania, with a slight level managerial efficiency (decision). This emphasizes that inputs remain high compared to levels obtained outputs which prints real problems in controlling costs and assurance maximizing revenue.

The analysis at the regional level of agricultural productivity from 2007-2013 it revealed a direct relationship with the classification used by regional agricultural models structural components. Thus, in the Southeast and West high levels of TFP it shows a more rational use of inputs relative to outputs and thus a real capacity to optimize their scale of operations (with technological increases of 10.8% in Southeast and 17.1% in West region). These regions have a higher farm size and higher incomes, economies of scale contribution to productivity growth due in particular those features.

In South region, although we have an efficient use of inputs, they were not adapted to the structural development of the region and the scale of operations (law managerial efficiency), productivity developments (growth 12.5%) due to the economies of scale (size activities of agricultural holdings). In Central, Northwest and Southwest regions there are no major changes,

and increased productivity was very low (3.6%, 6.9% and 2.5%) due in particular technological progress and the increase capital and overall efficient use of existing inputs. For the North-East, the effect of catch-up dominates curve border of efficiency, demonstrating that managed to optimize their scale of operations, the influence of economies of scale on productivity is higher managerial efficiency (technical efficiency of use of inputs and outputs).

The analysis allows us to conclude that there are major shortcomings on ensuring agricultural productivity from the current technology (inputs and outputs) in the Centre and South West, a positive development in the North West, North East and South (a real effect of technological change and the catching up of structural models developed agricultural) and a stagnation of growth in the South East and West (a sign that they have reached an optimum level of structural organization).

Structural elements involving changes to agricultural productivity, agricultural patterns both at structural and development regions were identified by regression models that surprised:

I) ***The correlations between the evolution of agricultural productivity in the agricultural patterns and structural productivity trend of the regional agricultural patterns*** measured by regression models allowed us to conclude the following:

- in the counties of Brăila, Timiş, Călăraşi, Ialomiţa, Bihor, Satu-Mare, Gorj, Mehedinţi, Olt şi Vâlcea, Bacău, Botoşani, Neamţ and Suceava any improvement in productivity of factors has a direct and positive impact on regional patterns of forming part;
- other counties have had a negative impact and low on regional patterns of belonging due to inefficiency inputs in almost half of the period.

II) ***The correlations between the structural development and total factor productivity at the structural agricultural models level*** enabled us to conclude that the influence degree of structural development on productivity increase was very low, so the structure of agriculture is not related directly with insurance productivity of factors, with the other defining factors contributing to the efficiency of agriculture structural models.

III) ***The correlations between the main identified components and total factor productivity at farm level structural models*** allowed us to conclude that the structure of the agricultural area has direct and negative importance on the development of

agricultural productivity in structural models.

IV) ***The correlation between the structural development item and total productivity factor at regional level*** allowed us to conclude that there is a correlation between the degree of regional structure development and increased productivity. Thus, the structuring of regional agriculture is related directly to ensure productivity of factors.

V) ***The correlations between the main components identified and total factor productivity at the regional agricultural models*** allowed us to conclude that the size of agricultural holdings has direct and positive relevance on the evolution of the productivity within regional agricultural models.

Structural variables influence on productivity was quantified by assessing the correlations between these variables and the total factor productivity. The analysis was performed by multiple linear regression model (function Cobb-Douglas) which allowed the identification of variable elasticity in relation with the TFP variation.

The main conclusion were:

- At the structural agricultural model the productivity growth was influenced by the share of agricultural area owned units and especially by the share of crop production value.
- At the regional agricultural model the productivity growth was influenced directly (in a positive way) by the shere holdings of 5--100 ha and negatively by size farms with cattle.

In these circumstances, the quantification achieved allowed us to identify the following improvement solutions in order to increase agricultural productivity:

Agricultural structural models:

- ***Agricultural structural models:***
    - Increasing the share value of crop production and the growth of the area held by the agricultural units. Changing these variables by 1% leads to an increase of approx. 0.592% of agricultural productivity.
    - Reducing the intake of farm work. Annual work units decreasing by 1% leads to an increase of approx. 0.163% of agricultural productivity.
- ***Regional agricultural models:***

- Increase the size of farms and the increase holdings over 100 ha. Changing these variables with 1% leads to an increase of approx. 0.348% of agricultural productivity.
- Increase the utilized agricultural area per holding. Increase the utilized agricultural area by 1% leads to an increase of approx. 0.214% of agricultural productivity.

CHAPTER I. CURRENT STATE OF THE RESEARCHES CONCERNING THE EVALUATION OF THE STRUCTURAL CHANGES AND PERFORMANCE IN AGRICULTURE
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