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# **AGRI-FOOD SECTOR IN SERBIA**

## **STATE AND CHALLENGES**

**Edited by**

**Academician Dragan Škorić**  
**Danilo Tomić**  
**Vesna Popović**

**Belgrade, 2013**

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### *Editors*

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# CONTENTS

<b>INTRODUCTION.....</b>	<b>1</b>
--------------------------	----------

<b>AGRICULTURE OF THE WESTERN BALKAN COUNTRIES IN GLOBALISATION AND LIBERALISATION PROCESSES .....</b>	<b>9</b>
--	----------

*Danilo Tomić  
Zoran Njegovan*

INTRODUCTION .....	9
1. RESULTS OF THE RESEARCH AND DISCUSSION .....	10
1.1. General Economic Conditions in Serbia and Western Balkan Countries .....	10
1.2. General Economic Indicators.....	11
1.3. Resource Indicators .....	18
1.4. Indicators of Agricultural Production .....	22
1.5. Value Indicators of Agriculture .....	24
CONCLUSIONS .....	27
ACKNOWLEDGEMENT .....	29
REFERENCES .....	29

<b>CHANGES IN THE STRUCTURE OF FARMS AND PRODUCERS ASSOCIATIONS IN THE REPUBLIC OF SERBIA .....</b>	<b>31</b>
---	-----------

*Miladin M. Ševarlić*

INTRODUCTION .....	31
1. CHANGES IN THE LAND SIZE STRUCTURE OF FAMILY FARMS .....	34
2. LAND SIZE STRUCTURE OF FARMS BELONGING TO LEGAL ENTITIES AND ENTREPRENEURS .....	41
2.1. Land size structure of agricultural enterprises .....	42
2.2. Land size structure of agricultural cooperatives.....	46
2.3. Land size structure of farms belonging to other legal entities and entrepreneurs ..	50
3. CAPACITIES OF ANIMAL PRODUCTION AND LEVEL OF EQUIPPING WITH TRACTORS AT FARMS .....	53
4. ASSOCIATIONS OF AGRICULTURAL PRODUCERS .....	55
4.1. Associations of farmers – owners of family farms.....	56
4.2. Associations of agricultural enterprises .....	58
4.3. Cooperative alliances.....	59
CONCLUSIONS .....	63
REFERENCES .....	68

**DEVELOPMENT CHARACTERISTICS OF AGRICULTURAL  
SECTOR IN SERBIA ..... 73**

*Milivoj Gajić*  
*Stanislav Zekić*

INTRODUCTION .....	73
1. LONG-TERM DEVELOPMENT TRENDS .....	74
2. DEVELOPMENT CHARACTERISTICS OF AGRICULTURE.....	76
2.1. Structure and Dynamics of Agricultural Production .....	77
2.2. Agricultural Production and Productivity .....	78
2.3. Export Performances of the Agri-food Sector.....	81
3. DEVELOPMENT CHARACTERISTICS OF AGRO-INDUSTRY .....	84
CONCLUSIONS .....	87
ACKNOWLEDGEMENT .....	89
REFERENCES .....	89

**DIFFUSION OF KNOWLEDGE AND INNOVATIONS IN  
SERBIAN AGRICULTURE..... 91**

*Jovana Čikić*  
*Živojin Petrović*

INTRODUCTION .....	91
1. FAMILY FARMS – FRAMEWORK FOR RESEARCHING POSSIBILITIES AND OBSTACLES IN LABOUR MODERNIZATION IN AGRICULTURE.....	92
2. PRODUCTION OF KNOWLEDGE FOR CONTEMPORARY AGRICULTURE – THE ROLE OF R&D IN AGRICULTURAL SCIENCES IN MODERNIZATION OF SERBIAN AGRICULTURE .....	95
3. AGRICULTURAL EXTENSION SERVICE IN SERBIA – CHARACTERISTICS AND POSSIBLE DEVELOPMENT PATHS .....	105
4. SOCIOLOGICAL AND RELATED COMPREHENSIONS OF THE DIFFUSION OF KNOWLEDGE AND INNOVATIONS IN SERBIAN AGRICULTURE – CURRENT STATE AND DEVELOPMENT PATHS OF SCIENTIFIC THOUGHT .....	109
CONCLUSIONS .....	111
ACKNOWLEDGEMENT .....	114
REFERENCES .....	114

**LONG-TERM STRUCTURAL CHANGES IN THE AGRARIAN  
MARKET IN SERBIA (1990-2010): CYCLICALITY OF  
PRODUCTION, OLIGOPOLISTIC OF DEMAND,  
EXTENSIVE GROWTH OF EXPORT ..... 119**

*Milan Milanović*

INTRODUCTION .....	119
1. TRENDS OF GROWTH OR FALL IN TOTAL AGRICULTURE.....	121
1.1. The Alternateness of the Annual Growth and Fall.....	122
1.2. The Sinusoid of Soil Cultivation and the Falling Parable of Livestock Breeding .....	123
2. SECTORAL CHARACTERISTICS OF OSCILLATIONS IN PRODUCTION.....	125
2.1. Plant production .....	125
2.2. Livestock production .....	126
3. COMPETITION AND THE CHARACTERISTICS OF THE STRUCTURE OF THE AGRARIAN MARKET IN SERBIA .....	127
3.1. Competition of Offer/Producers .....	128
3.2. The Oligopsonistic Structure of Processing .....	128
3.3. The Oligopsony of Trade, Especially of Hypermarkets .....	129
3.4. The Inefficient Competition Protection System.....	130
3.5. Undeveloped Market Institution .....	131
3.6. Unregulated Trade in the “Green Marketplace” .....	132
4. GROWTH OF AGRARIAN EXPORT TOGETHER WITH RADICAL STRUCTURAL EXTENSIFICATION .....	133
4.1. The Dynamics and the Coverage of Import by Export.....	134
4.2. The Agrarization of Total Export .....	135
4.3. The Extensification of the Export Structure.....	136
CONCLUSIONS .....	138
ACKNOWLEDGEMENTS .....	140
REFERENCES .....	141

**FOREIGN TRADE EXCHANGE OF AGRO-INDUSTRIAL  
PRODUCTS OF SERBIA ..... 143**

*Branislav Vlahović*

*Anton Puškarić*

INTRODUCTION .....	143
1. SOURCES OF DATA AND METHODOLOGY OF RESEARCH .....	143
2. RESEARCH RESULTS.....	144

2.1. Export of Agro-Industrial Products from Serbia .....	144
2.1.1. Export of Agro-Industrial Products per Commodity Groups and Sectors .....	146
2.1.2. Regional Determination of Export of Agro-Industrial Products .....	149
2.1.3. Export Expansion Factors .....	155
2.2. Import of Agro-Industrial Products of Serbia .....	156
2.2.1. Import of Agro-Industrial Products by Commodity Groups and Sections .....	157
2.2.2. Regional Origin of Import of Agro-Industrial Products .....	159
2.3. Foreign Trade Exchange Balance of Agro-Industrial Products .....	162
CONCLUSIONS .....	164
ACKNOWLEDGEMENTS .....	165
REFERENCES .....	166

## **SUSTAINABLE MANAGEMENT OF LAND, WATER AND BIODIVERSITY IN AGRICULTURE UNDER CLIMATE CHANGE .....**

167

*Vesna Popović*  
*Zorica Vasiljević*

INTRODUCTION .....	167
1. SUSTAINABLE LAND MANAGEMENT .....	170
1.1. Soil and Land Quality .....	170
1.2. Land Use and Land Use Change .....	172
1.3. Land Degradation .....	175
2. INTEGRATED WATER RESOURCES MANAGEMENT .....	178
2.1. Water Resource Availability .....	178
2.2. Water Quality .....	179
2.3. Irrigation and Drainage .....	182
3. AGROBIODIVERSITY AND LANDSCAPE PROTECTION .....	184
3.1. Genetic Resources in Agriculture .....	184
3.2. High Nature Value Farmland .....	186
4. CLIMATE CHANGE AND AGRICULTURE .....	187
4.1. Basic Climate Characteristics .....	187
4.2. Climate Change Trends .....	188
5. POLICIES OF SUSTAINABLE NATURAL RESOURCES MANAGEMENT IN AGRICULTURE UNDER CLIMATE CHANGE .....	189
CONCLUSIONS .....	193
ACKNOWLEDGEMENTS .....	196
REFERENCES .....	196

<b>TERRITORIAL CAPITAL OF RURAL AREAS: AN EXAMPLE OF ANALYSIS OF THE POTENTIAL FOR RURAL TOURISM DEVELOPMENT IN SERBIA.....</b>	<b>201</b>
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*Natalija Bogdanov*

*Dejan Janković*

INTRODUCTION .....	201
1. TERRITORIAL APPROACH TO RURAL DEVELOPMENT .....	204
2. A CONCEPT OF RURAL TERRITORIAL CAPITAL.....	207
3. TERRITORIAL CAPITAL OF RURAL AREAS AS POTENTIAL FOR DEVELOPMENT OF RURAL TOURISM IN SERBIA .....	212
3.1. Serbia – Diversification of Rural Territory .....	212
3.2. Methodology of Estimating the Territorial Capital of Rural Regions .....	
3.3. Results and Discussion .....	218
CONCLUSIONS .....	227
ACKNOWLEDGEMENT .....	230
REFERENCES .....	230

<b>POLICY OF SUPPORT TO AGRICULTURE AND RURAL DEVELOPMENT .....</b>	<b>233</b>
---	------------

*Koviljko Lovre*

INTRODUCTION .....	233
1. AGGREGATE SUPPLY AND DEMAND FOR AGRICULTURAL PRODUCTS AND FOODSTUFFS.....	234
2. THE ECONOMIC POSITION OF AGRICULTURE .....	240
3. EVALUATION OF THE AGRARIAN POLICY IN SERBIA .....	245
CONCLUSIONS .....	256
ACKNOWLEDGEMENT .....	257
REFERENCES .....	258

<b>INDEX OF TERMS.....</b>	<b>259</b>
----------------------------	------------



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# **POLICY OF SUPPORT TO AGRICULTURE AND RURAL DEVELOPMENT**

*Koviljko Lovre*

## **INTRODUCTION**

If we accept the usual systematization of agrarian policy measures on:

- measures of price policy regarding (prices in narrow sense, reserves, crediting of production and stocks, regulation of exchange with foreign countries);
- measures of development policy (policy of investment – including the basic agricultural infrastructure, development and application of research, stimulating the use of fundamental inputs),
- measures of adapting the agrarian structure (property relationships – including inheritance and property size, re-grouping of holdings, land redistribution, norms for some forms of production),
- measures of social and fiscal policy (taxes and contribution, health and pension insurance, public welfare, make easier transfer of the agricultural population, etc.),

it means that this part of the work will deal with the basic questions of the agricultural policy in Serbia in the recent past and the present, without prejudicing the physiognomy of the agricultural policy in the future. In addition, the physiognomy of the future agricultural policy is more or less known and, doubtlessly, that it will be structures based on satisfying all requirements to join the World Trade Organization and adapting to the Common Agricultural Policy of EU. It simultaneously means that this part of the work will not deal with the problems of criteria based of which some measures and instruments of the agricultural policy were determined. It is enough to note that criteria have often been mutually conflicting, primarily when relating to price policy in the narrow sense, supply policy, policy of agricultural subvention and crediting production and supply of agricultural products and foodstuffs. Especially inexplicable are the turns in the policy of developing extension services.

The primary goal is to approximate efficiency and consequences of measures and instruments, at the level that satisfy the volume and quality of statistical material, without getting into the evaluation of completeness and inter-conditionality of the governmental set of measures in some segments of the policy. In addition, the history is not of great importance;

therefore, the work will be primarily concentrated on the first decade of the 21<sup>st</sup> century, i.e. the changed political and macroeconomic conditions. The task is not very simple for two reasons. First, authors are not informed about works in the domestic literature, which, except the descriptive approach, quantitatively and analytically deal with the efficiency of measures and instruments of the Serbian agrarian policy in the recent past, in spite of the developed econometrical and statistical instruments. Therefore, authors had to rely on different statistical materials being mutually incomparable for information quality. Some notes will be always given in the text about this so the results of calculation should be taken as an orientation giving to this due reserve judgment. In fact, available evidences have determined the structure of the work.

The evaluation of dynamic coordination of supply and demand of agricultural and food products and the economic position of agriculture in income creation and distribution are the starting point and the framework of conditions where some measures of the agrarian policy are composed, on the one side, and the ambient for the evaluation of efficiency, on the other side.

Efficiency evaluations of the agrarian policy always amount to the attempt of synthesis of the bulk of analytical data. It is understandable; this work cannot pretend to give sufficient analytical support. Analytical support is created in the period of systematic researches lasting many years. Trying to synthesize, this shortage can be only partly moderated by using the experiences of countries with similar resource structure. Therefore, synthesis must be done more relying on foreign experiences than on reliable support. Awareness of these facts has exerted influence on the conception of this work.

## **1. AGGREGATE SUPPLY AND DEMAND FOR AGRICULTURAL PRODUCTS AND FOODSTUFFS**

Based on statistical evidence, the coordination of agricultural supply and demand of agricultural and food products can be evaluated only approximately. In spite of the lack of evidence in statistical materials, by comparison of the growth rate of expenses of the population for food and agricultural production, it is more than obvious that aggregate supply has

exceeded demand to a certain extent in the last 12 years.<sup>1</sup> There are numerous indications that the supply of agricultural and food products exceeded demand in average in the period from 2000 to 2011. The first indication comes from interdependence of food expenses in relation to the total expenses of the population for personal spending and relative prices of agricultural and food products in retail trade. Having in mind the reliability of statistical evidences, interdependence is high, evaluated parameters are statistically significant, and autocorrelation of the residuals is considerably over the allowed limit (Fig. 1 and 2).

It results from the cited interdependence that relative prices of agricultural and food products showed slow drop in prices, meaning that aggregate supply exceeded aggregate demand. Food expenses increase yearly per the rate of 0.72 % in average.<sup>2</sup> Such a slow imbalance of supply and demand with relative low income elasticity of demand relating to the level of economic development (0.3% in average)<sup>3</sup> and the low price elasticity of demand (-0.23%)<sup>4</sup> unavoidably meant that some surplus of supply had a disproportional price effect. It finally meant parity aggravation of the economic position of agriculture. Really, relative prices of agricultural and food products in the market of personal consumption decreased per annum average rate of -0.65%.

---

<sup>1</sup> Determination to analyze the period from 2000 to 2011 was based on changed political and macroeconomic circumstances in relation to the previous decade. First, the conclusion relates to the “opening” of the economy since 2000 relating to the completely closed economy until then. Changes of circumstances unavoidably meant the necessity of adaptation of agriculture, about which we will talk later.

<sup>2</sup> All growth rates in this part of the text are calculated from the linear trend. High year variations of analyzed aggregates do not allow the calculation from original data.

<sup>3</sup> It is important to note again that imperfectness of statistical files. From the series of data of the total expenses for personal spending and food expenses, the size of income elasticity of demand for agricultural and food products is calculated. However, part of food expenses in the total expense for personal consumption, according to the questionnaires of the population amounts to 41%. Having in mind the level of economic development, it is certainly a more real value. Based on registered values, share for food in the total expenses for personal consumption has stagnated since 2008, while the same on the questionnaire based value has increased.

<sup>4</sup> The estimate of basic elasticity for food demand is done from interdependency of food expenses (constant prices in 2002) and the prices of retail agricultural and food products settled by general price index taking deflation into consideration:  $\ln Y = 13.50745 - 0.22826 \ln X$ ;  $R = -0,519$  ( $Y$  – food expenses,  $X$  – relative prices of agricultural and food products).

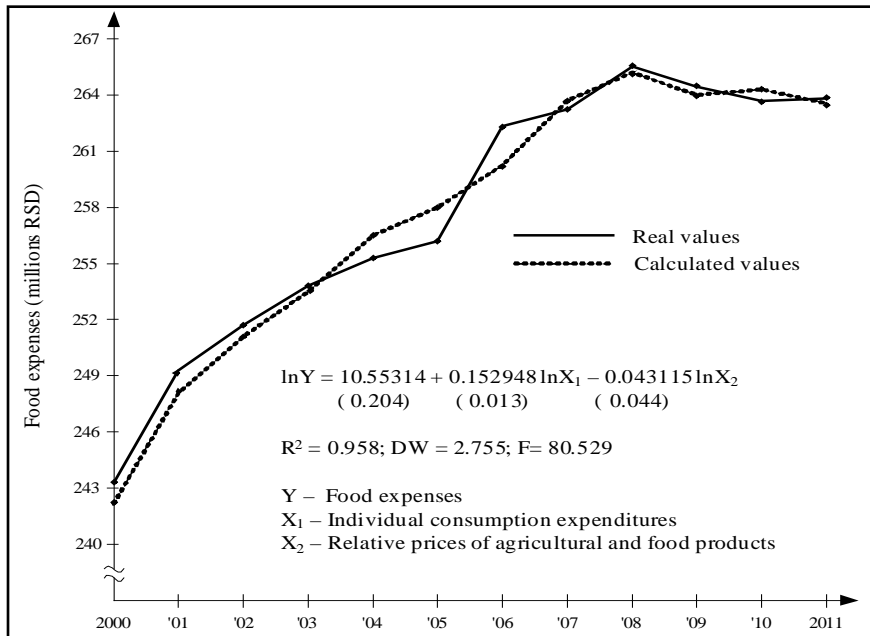


Figure 1: Actual and calculated values of food expenses (constant prices, 2002)  
Source: Own calculations on the basis [6].

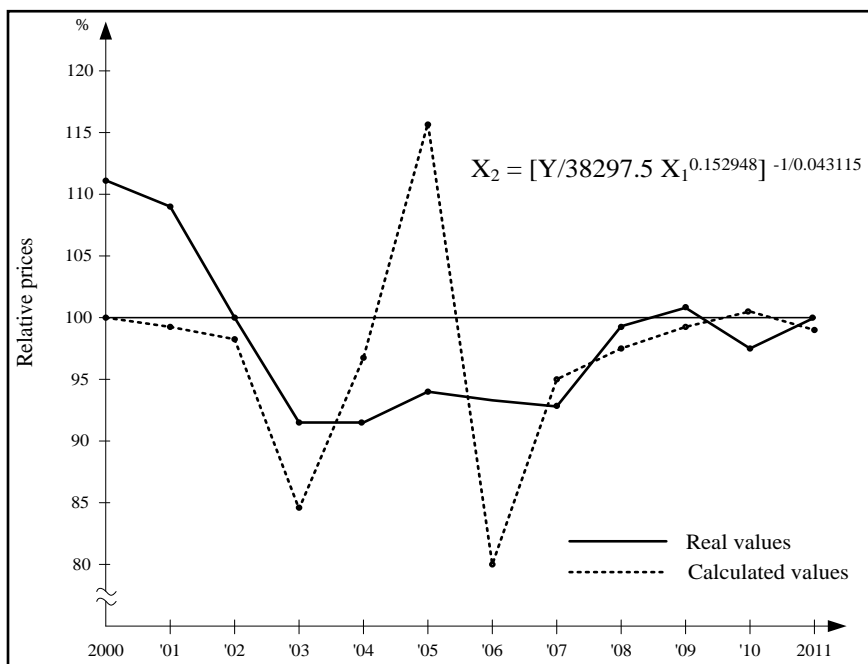


Figure 2: Actual and calculated relative prices of agricultural and food products in retail trade (Consumption price index = 100)

Source: Own calculations on the basis [6].

Second, a more reliable indication for the same conclusion comes from the estimate of combined growth rate of agriculture and food industry (food production).<sup>5</sup> To make reliable the combined supply growth rate of agriculture and food production in the market of personal consumption fairly well, it would be correct to rely on input-output relationships between agriculture and industry of food production. However, data unavailability on weighted agriculture and food industry leaves only one possibility of estimating the approximating combined supply rate based on share of these sectors in the social product. It can be expected that share of agriculture in the total supply of agricultural and food products will decrease on “behalf” of food production, being the logic of development process on what almost the double growth of physical volume of food production refers in relation to the growth of the physical volume of agricultural production (1.81:0.93%). However, share of agriculture in the Gross Domestic Product stagnates, while share of food industry was reduced in the cited period. This moment we should have in mind when approximating the total food supply.<sup>6</sup>

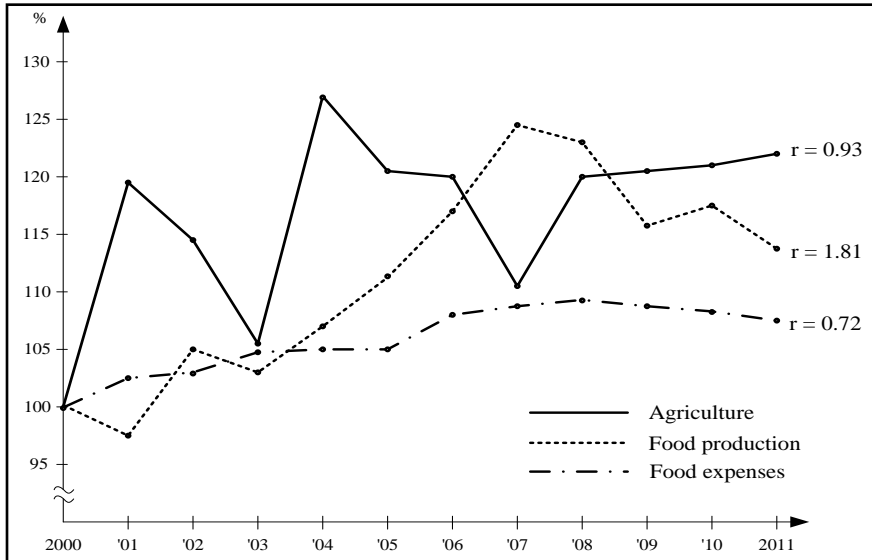
The estimate of combined supply gives the average rate for the cited period of about 1.15%.<sup>7</sup> Demand growth for agricultural and food products amounted to 0.72%; it is an additional indication to draw conclusion about imbalance of aggregate supply and demand of agricultural and food products in the period from 2000 to 2011 (Figure 3).

---

<sup>5</sup> The estimate excludes drink and tobacco industries, although it would be methodologically more correct to include these industries into the estimate. However, the change of data registration system in the statistical service has caused the only possible estimate.

<sup>6</sup> The second essential methodical problem, which in the estimate of combined rate of agriculture and food policy could not be surmounted relates to the indices of the physical production volume. The indices of agricultural production growth are shown based on net final production, while the indices of physical volume of food industry are reported the “gross” basis. It means that in case of food production, the total production is reduced neither for internal reproduction nor for reproduction input from agriculture. Therefore, the combined change rate of food supply should be taken with due dose of reserve, especially during establishing connection with final consumption.

<sup>7</sup> From the estimate of the combined growth rate of food supply appears that the contribution of agriculture to the growth of supply is 69.8%, and the food industry of 30.2%. (The estimate was done based on the formulae:  $r_p x + r_{pi}(1-x) = r_k$ ;  $r_p$  – growth rate of agricultural production;  $r_{pi}$  – the growth rate of food production;  $r_k$  – the combined growth rate of supply of agricultural and food products).



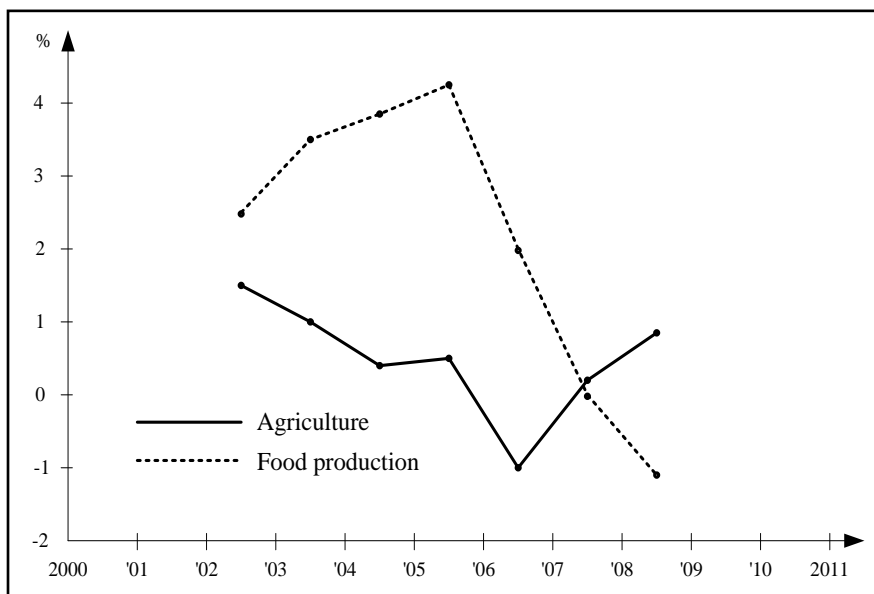
*Figure 3: Growth indices: Agricultural production, food production and food expenses*

Source: Own calculations on the basis [6].

Of course, the relationships of average values are only the starting point in the dynamic analysis of relations of agrarian supply and demand of agricultural and food products. The fact that characterizes the time we talk about and what specially worry us are the slowdown of agricultural production growth and the absolute fall of food production since 2007. The slowdown is obvious from the trend of production volume and more obvious from six-year movable trends (Figure 4). In addition, illogicality of contrary directions in the growth of agriculture and food industry has been visible after 2004, where the instability of agricultural production surpasses the instability of food production, with relatively stable growth of food expenses, and it is an additional indication of above average of price effects. According to the logic of interdependence, the relationship of year indices of agriculture growth and food industry could be approximate to the growth of food expenses. Really, interdependence is, overall, high<sup>8</sup> with expressive deviations to the lower one in 2001 and 2004, and the upper in 2007. It means that in these years, there were

<sup>8</sup> The estimate in the text derives from the relationship of production volume index: agriculture and food production, food on the one side, and the growth index of food expenses, on the other side. Interdependence is expressively emphasized:  $Y = 27.339 + 0.613X$ ;  $R = 0.915$ ;  $Y$  – relationship of the index of production volume of food production and agriculture;  $X$  – index of food expenses in constant prices), therefore, the estimate is enough reliable.

underestimating, i.e. overestimating the growth of agriculture or food production, or both. Judging by these facts, it is about overestimation, i.e. underestimation of food industry growth because of “wavy” introduction and unsystematic registration of “new” products in the index account.



*Figure 4: Calculated growth indices from six-year movable trends*  
Source: Own calculations on the basis [6].

The estimate shows an unexpected high growth of food production in average in relation to the growth of agriculture of almost 2:1.<sup>9</sup> Such a result can be explained by two moments. First, in this period, the growth of agricultural products processing was essentially conditioned by repression of processing and finishing in households and handicrafts. It means that the index of food production growth was appreciably over the real supply growth of this industry in the market of personal consumption. Regarding to the fact that the growth of food production could not be possibly reduced for the growth that was caused by repression of processing in households and handicrafts, it was not possible to estimate net supply of this branch. Second, growth indices of

<sup>9</sup> The relationship of interdependence is  $\ln Y = 2.754 + 0.411 \ln X$ ;  $R = 0.350$  (Y – index of food production growth; X – index of agricultural production growth). The low level of interdependence additionally confirms the illogicality of statistical registering of production volume.



food industry, contrary to agriculture, were not registered on net basis, but they include reproduction consumption of the branch, which, as a rule, appreciably grows faster than net final supply. These both moments are not essential for the text that follows, but only as an indication on the approximate estimate of aggregate supply and demand of agricultural and food products. This relationship predominantly determines the parity of economic position of agriculture, on the one side, and exerts influence on the physiognomy and structure of measures and instruments of agricultural policy.

## **2. THE ECONOMIC POSITION OF AGRICULTURE**

In the work of this character, it does not make sense to emphasize what measure the parity of economic position of some economic sectors and branches exerts influence on not only the tempo of growth but it has direct regional and social reflections, whose “specific weight” unavoidably rises together with the level of development. With this, the parity of economic position is the basic point both current and development policy.

“Agriculture is a unique example of economic sector which legally develops in the conditions of the decline of human and material resources. Relative decline of resources implies, of course, the disparity of economic position of agriculture. Looking at that in a development-historical way, the disparity of economic position of agriculture is both the “trigger” and the generator of economic development, but the generating influence falls during development” [3].

The disparity of economic position of agriculture is an empirical fact, at least. This is the same with the tendency of narrowing initial disparity in the position of agriculture in the development period. However, although the functional connection between the level of development and disparity of the position of agriculture is not disputable, this relationship is not direct. The significant deviations appear under the influence of the whole range of influences, among which the prevailing are: proportion of initial disparity, composition of resource – in agriculture and in general, speed of economic growth, etc.

Development in the conditions of relative fall of resources supposes the degree of adaptation far above average. The process of adaptation is extremely complex; it substantially limits the preciseness of measuring proportions and tendency of economic disparity. However, the comparative analysis of disparity of economic position can be used as a reliable indicator of physiognomy and implication of agricultural policy.

Parity of the position has two basic forms. First, parity in creation and the other, more important, parity in distribution of Gross Domestic Product or Gross National Product. However, these are the “final” relationships because the influence of relationships in reproduction consumption on the income level is omitted.<sup>10</sup> Namely, it is not difficult to suppose how much the statistical service is unable to register an endless abundance of processes characterizing adaptation or transformation of agriculture. Problems are huge and they begin with the definition of the “agricultural population” category, even more with registering the degree of activities of the agricultural population.<sup>11</sup> However, main difficulties are in registering the income of agriculture from “non agricultural activities”. Further difficulties appear in registering the position of agriculture in redistribution. Some essential features cannot be quantified, while the other, as a rule, cannot be registered with satisfying preciseness (for instance, net subventions in agriculture according to different bases). At last, the exceptional dual character of our agriculture makes the analysis difficult. In coexistence of the two sectors within agriculture differing not only in the degree of development but, more important, in economic behaviour, comprehension of agriculture overall, has a very limited relevance. This is the reason for the relationships in this part of the analysis will be done roughly for the sector of agriculture overall.

Taking into consideration that the quality of records requires a necessary gradual procedure in measuring parity or relative economic position of agriculture, first there will be carried out the parity of the gross value added of agriculture. The parity of economic position is based on gross value added per active inhabitant in non-agricultural sector of agriculture in relation to the net value added per active inhabitant in the sector of agriculture – all at the current price. For the reasons already mentioned,

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<sup>10</sup> To “lessen” somewhat the problems cited in the text, authors determined to the estimates of the parity of economic position and labour productivity based on the Gross Value Added. Finally, systematic problems in registering do not influence essentially on tendencies that is important in such analyses.

<sup>11</sup> To illustrate, it is enough to refer to the definitions and comprehensiveness of agricultural population in our censuses.

the analysis is “located” in the period from 2000 to 2011, and the base relationship, for the same reasons, is “bound” for 2002.

The results of the estimates in Table 1 and also illustrated in Figure 5 definitely confirm the statements done based on the analysis of relationships of aggregate supply and demands of agricultural and food products. The imbalance of supply and demand had unavoidably the price effects reflected in tendentious aggravation of economic position of agriculture at the annual rate of -2.35% in average; therefore, the position of agriculture, in time average, was under the average level of non-agricultural sector. The exception is the starting years of the analysis; it is the period when the economy of Serbia “functioned” according to the model of closed economy. The graphic representation convincingly demonstrates the gradual aggravation of the position of agriculture with the degree of “opening” the economy. It proves that “closing” the economy unusually influences non-agriculture; primarily the industrial sector of the economy, i.e. agriculture is a more vital sector in irregular conditions of business.

<i>Year</i>	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Economic position parity	97.87	102.56	77.68	70.95	77.86	70.10	68.06	65.24	70.80	66.42	74.59	84.14
Labour productivity parity	70.60	78.97	77.68	67.42	87.10	81.66	80.28	72.77	79.10	86.80	88.73	95.98
Parity of prices	138.63	129.87	100.00	105.25	89.39	85.84	84.77	89.66	89.51	76.52	84.07	87.66

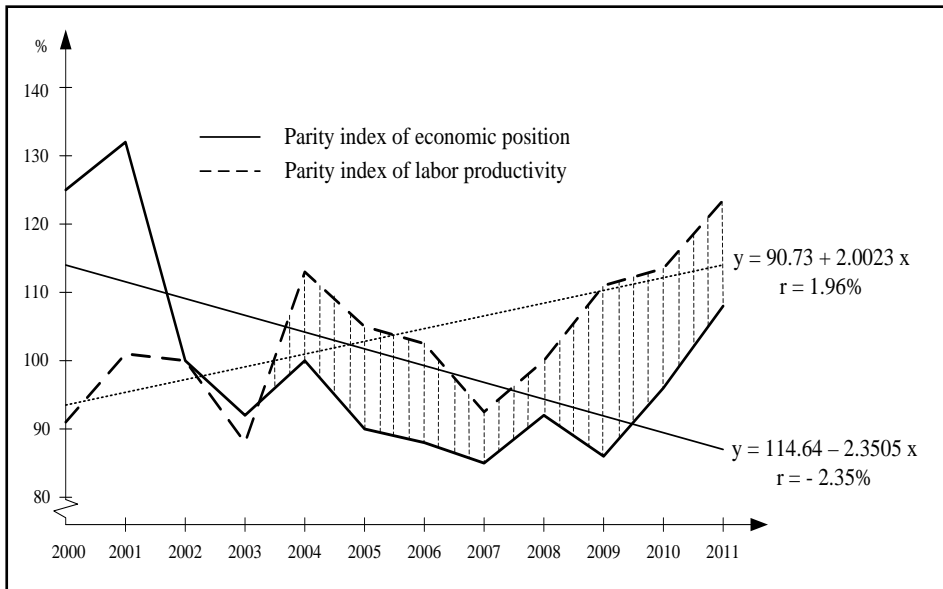
*Table 1: Parity of economic position, labour productivity, and prices in creation Gross Value Added*

Source: Own calculations on the basis [6].

<i>Year</i>	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Economic position parity	97.06	101.98	77.34	70.61	77.54	69.83	68.13	65.30	70.76	66.43	74.53	84.15
Labour productivity parity	70.02	78.53	77.34	67.09	86.75	81.35	80.37	72.83	79.06	86.81	88.65	96.00
Parity of prices	138.63	129.87	100.00	105.25	89.39	85.84	84.77	89.66	89.51	76.52	84.07	87.66

*Table 2: Parity of economic position, labour productivity, and prices in distribution Gross Value Added*

Source: Own calculations on the basis [6].



*Figure 5: Economic position and labour productivity parity in creation of gross value added*

Source: Own calculations on the basis [6].

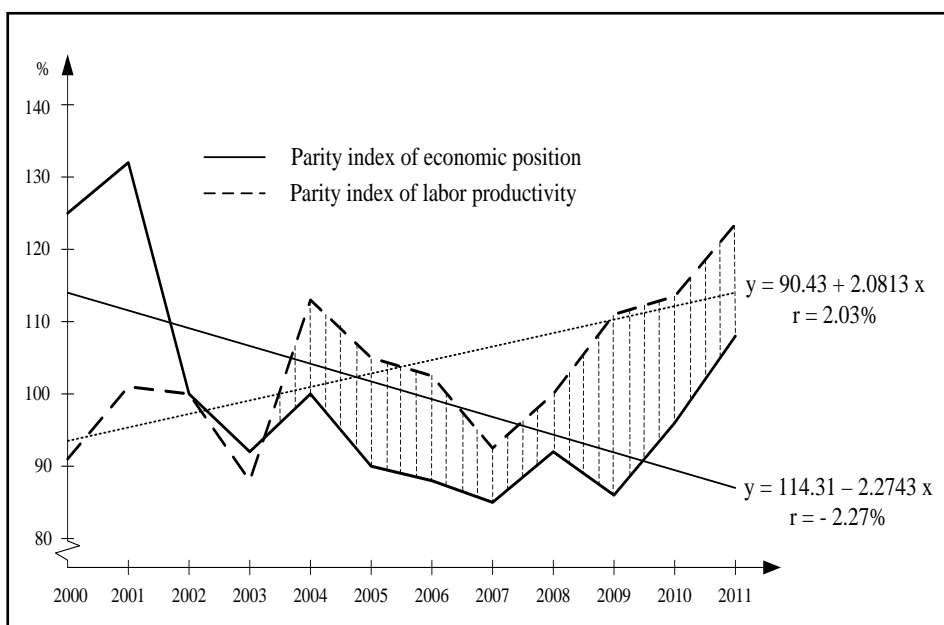
Here, it is very important to ‘isolate’ two basic influences on the parity of economic position. First, it is the influence of the parity of labour productivity, and second, it is about the influence of price parity. The parity of labour productivity derives from the same relationship as the economic position parity, but it is based on constant prices. The influence of prices derives, of course, from the relationships of economic position parity and the parity of labour productivity.

In the observed period, labour productivity in agriculture increased faster than in non-agricultural part of economic activities. The growth of labour productivity of agriculture was convincingly surpassed the same value in non-agricultural part of the economy – the growth rate of relative productivity of agriculture amounts to 1.96%. Therefore, it results that the influence of relative relationship of prices significantly reduces the influence of growth of relative labour productivity on the parity of the economic position of agriculture.<sup>12</sup>

<sup>12</sup> Shaded parts in Figure 4 illustrate the changes of price influences from year to year, as well as the basic tendency.

Such an expressively negative influence on the economic position of agriculture is not logic; neither can it be considered regular relationship with production activities in the given frameworks of economic development. According to the logic of development processes, we should expect that the growth productivity rate in non-agricultural part of the economy increases faster than in agriculture and it would cause the converse influence of price relationships. The shown relationships are characteristic in a significant upper phase of development, when for reduction of share of the agricultural population, the rate of transfer of the population in agriculture rapidly grows.<sup>13</sup>

Parity of the position in distribution is far more important in the agriculture sector (Table 2, Figure 6).<sup>14</sup>



*Figure 6: Economic position and labour productivity parity in distribution of gross value added*

Source: Own calculations on the basis [6].

<sup>13</sup> Experience says that a sudden disparity of agriculture comes after reduction of the share of agriculture population under approximately 12% mostly primarily due to the high population transfer rate.

<sup>14</sup> It would be interesting to analyze the position of agriculture in the secondary and tertiary distribution, as well as the analysis of internal parity determining the structure of agricultural production, but these themes are not within this work.

The economic position parity of agriculture is estimated by the identical methodology as the parity in creation, so the estimate is based on the overall agricultural, i.e. non-agricultural populations. According to the logic of mutual relationships, the position of agriculture in distribution "follows" the position in creation, therefore, there is still the statement that the disparity of agriculture overall noticeably under the proportion that would correspond to the level of general development. Finally, the influence of relative labour productivity and relative prices remains more or less unchanged in relation to that illustrated in the analysis of the position parity in creating the gross value added.

### **3. EVALUATION OF THE AGRARIAN POLICY IN SERBIA**

The previous analysis has convincingly shown that the agriculture in Serbia, after „opening“ the economy, has developed in the conditions of three mutually conditioned tendencies: 1) growth of relative labour productivity; 2) decrease of relative prices of agricultural and food products; and 3) decrease of income elasticity of demand for agricultural and food products. As for the importance of agricultural development, it is interesting to emphasize the reflection of decreasing income elasticity of demand on the volume of commercial disposal of agricultural and food products. Namely, the lower demand elasticity means that the volume of potential disposal of goods represents the basic limiting factor of growth of agricultural production, where the reflection is the final low rate of the physical production growth.<sup>15</sup>

The composition of influences of relative productivity, relative prices and income demand elasticity has caused the decrease of agricultural income per capita in relation to the same size in the non-agricultural sector. With much emphasized income and social dispersion within the agricultural sector and the extreme unfavourable property structure, the combinations of all the cited factors, unavoidably "compel" the wide spectre of interventional- regulative measures. We should take into consideration

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<sup>15</sup> An additional factor of limiting the disposal of agricultural products represents also the reduction of the total population number. Between the last two censuses, the average annual rate of population decrease amounted to 0.47%. The population decrease and the low-income elasticity of demand are the basic factors which determined the supply of agricultural and food products.

that Serbia, on the average, used to be the net exporter of agricultural and food products. Namely, the position of the net exporter country requires an essential different structure of intervention measures relating to the position of the net importer, simply because price policy hardly offers the possibility of efficient intervention. Therefore, the net exporter country is forced to support relatively high budget subventions, which is always and everywhere the measure of arbitrary income drain.

Therefore, that may turn out to be useful, before a detailed quantitative analysis, to give a short review of consistency of changes in the interventional-regulative mechanism during relatively short period. This review is necessary to present the “turns” and inconsistency in the agricultural policy of Serbia (Table 3, Figure 7).

2000-2003	2004-2006	2007-2008	2009-2011
<ul style="list-style-type: none"> <li>• Price support for basic agricultural products;</li> <li>• Material interventions on the market;</li> <li>• Subventions for buying agricultural land.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduction of price support;</li> <li>• Input subventions;</li> <li>• Credit subventions</li> <li>• Introduction of the registry of agricultural producers;</li> <li>• Support to adapting to international standards.</li> </ul>	<ul style="list-style-type: none"> <li>• Elimination of support to rural development;</li> <li>• Elimination of measures of credit support;</li> <li>• Support reduction to structural adaptation;</li> <li>• Subventions to agriculture according to the principle of „area and herd payment“.</li> </ul>	<ul style="list-style-type: none"> <li>• Support restrictions by paying pension insurance;</li> <li>• Break with subventions to non-commercial farms;</li> <li>• Intensifying conditions for „area payment“;</li> <li>• Support reduction to structural adaptation;</li> <li>• Reduction of investment support;</li> <li>• Attempt to leave „area payment“, and repeated introduction of price support.</li> </ul>

*Table 3: Periodization in the composition of measures of the agricultural policy in Serbia*

The general characteristic of the overall of the time period after 2000 relates to the process of political decision-making that has brought unstable agricultural policies and created uncertainty for agricultural producers and other participants in the production chain and food

distribution. The process of policy formulation is not based the on ex-ante estimation of effects of new measures and instruments, or even rigid estimation of the former policy. Too big discretion right of the Ministry, with marginal role of the Parliament, distribution and purpose of budget resources, together with political instability, have created the framework where the producers' interests is tried to be presented, and not interest of the state on the whole. In such a situation, changes in price policy and agricultural subventions have usually had the lack of stable effects on business conditions. An extreme uncertainty has been manifested in unfavourable conditions to invest in agriculture, although the measures of agricultural policy have solved some of the short-term problems.

The declarative attempt to increase supply and the production efficiency of agricultural products has not been materialized in measures of the agricultural policy, well illustrated by the “turn” and inconsistency of the structure of agricultural policy measures (Table 3).<sup>16</sup> It is indisputable that liberalization of market agricultural and food products has been literally changed, with extremely negative effects on the size of supply. Namely, in the conditions of supply surplus without the system of guaranteed or minimum prices, which would guarantee the “parity” income to producers, is not possible to exert significant influence on production size. In addition, today, the usual practice to regulate supply in the most developed countries is carrying out the policy of guaranteed prices, disregarding if they want to limit or increase supply. In essence, the guarantee mechanism for is carried out by means of two methods: 1) method of paying price differences, and 2) method of determining market price by the level of guaranty or protection.<sup>17</sup> Without the guaranty system, the efficient work of the mechanism of material intervention on market is not possible (creation and release of reserves on the market) and, in essence, it was the subject of arbitrary estimation of market conditions, and therefore, not enough efficient. It is necessary to

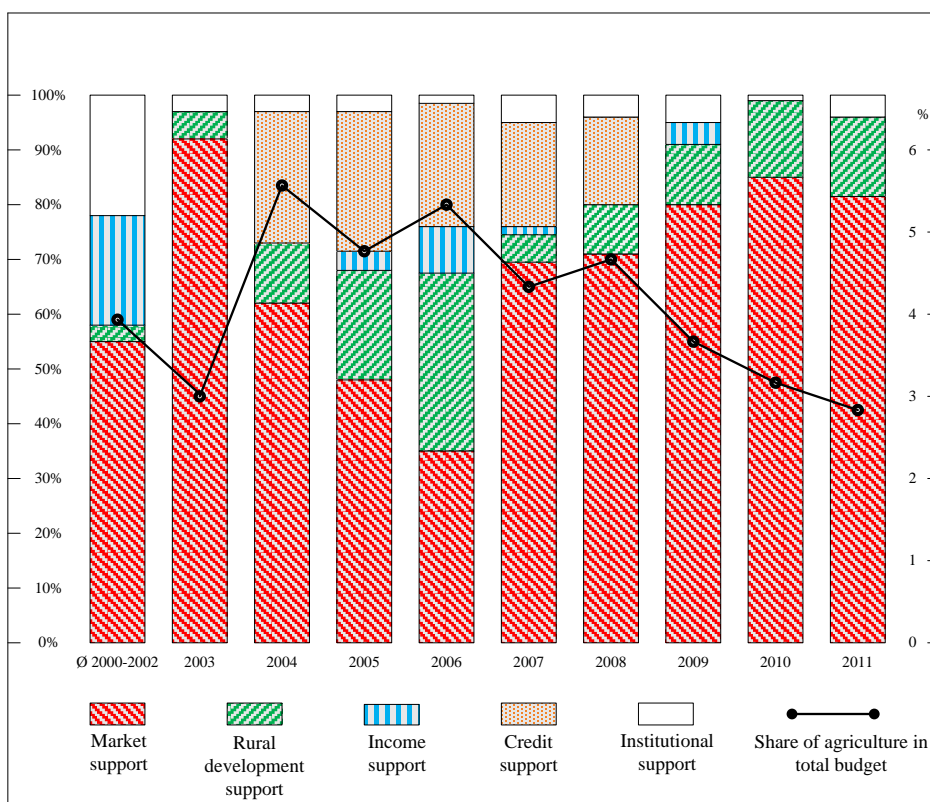
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<sup>16</sup> Classification structure of the budget support to agriculture somewhat differs from the classification carried out by the group of authors [2]. No doubt, this work is a pioneer attempt to systematize the budget support to agriculture based on correct methodology, and according to the methodology accepted in the Organization for Economic Co-operation and Development (OECD).

<sup>17</sup> Today EU issues intervention prices for the majority of agricultural and food products, as the measure of super protection of producers. Intervention measures react in case if the basic protection system, usually very efficient, is endangered even for short.



say that the system of guarantee is, although requires a lot of paper work during its carrying out, very efficient in the conditions of non-elastic supply and extremely low income elasticity of demand because it primarily prevents serious disturbances on market. Serbia has determined, of course, according to the model of EU, to subsidize agriculture by paying per hectare for registered agricultural holdings up 100 ha and head of livestock (direct paying). In principle, this mechanism is not in doubt, but the desired efficiency is attained in the combination with price guarantee. Namely, if subsidizing is carried out without any combination with price policy (paying differences in price), distributive effects, which normally depends on the relationship of price elasticity of supply and demand, are less favourable for agricultural producers.



*Figure 7: The structure of budgetary support for agriculture in Serbia*  
Source: Own calculations on the basis [13].

To estimate instrument efficiency of direct paying per hectare and head of livestock, it is necessary to estimate price elasticity of agriculture supply.<sup>18</sup> Logically, because of the former cited deficiencies, the estimate of price elasticity of agricultural supply had to be based on the minimum of data. The estimate results in a very low short-term price elasticity of supply: 0.0999. No doubt, the estimated coefficients of elasticity of supply and demand definitely point to the earlier statement on the encounter of low elasticity of supply and demand and the need to “set up” combine the system of price guarantee into the mechanism of direct payment. Even more, in the conditions of surplus of supply the combination of direct paying and price guarantee, or much better target price, the paying as differences in price, fewer amounts of resources for subventions would be required in our conditions.

It has been already noted that the distribution effect primarily depends on the estimated values of elasticity of supply and demand. Taking into consideration that elasticity has a correct indication, it means that subventions reduce product price “on the threshold” of agriculture. Price reduction of agricultural products automatically means that the whole amount of subventions does not belong to agricultural producers, but

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<sup>18</sup> The estimate price elasticity of supply has already been done. See footnote 4. The method of the estimate applied in this work is adopted by Food and Agricultural Organization (FAO). The estimate is based on the functional relationship:

$$Y_t = \alpha_1 \beta \cdot P_{t-1}^{\alpha_2 \beta} \cdot Y_{t-1}^{(1-\beta)} \cdot T^{\alpha_3 \beta} \cdot U_t$$

Where the symbols represent:

$Y_t$  - index of physical volume of agricultural production;

$P_t$  - price index of producers of agricultural products deflationary arranged by price index of producers of industrial products;

$T$  - time;

$U$  - residual value.

The estimated coefficients:  $\alpha_2 \beta$ ,  $(1 - \beta)$  and  $\alpha_3 \beta$  represents elasticities in the short run. If we want estimate elasticity in the long-run, then the short-run elasticity are divided with  $\beta$ . The results of the estimate:

$$Y_t = 6.042674 \cdot P_{t-1}^0 \cdot 0.999904 \cdot Y_{t-1}^{-0.441812} \cdot T^0 \cdot 0.97827 ;$$

$$R^2 = 0.557; DW = 1.9345.$$

(0.052840) (0.288262) (0.272251) (0.072601) ; - standard errors of the estimation.

Although the estimated parameter of price elasticity of supply has a logic indication, it is not statistically significant, but still it can be used as an orientation estimate of distributive effects of direct paying.

processors and/or end users usurp part of it. Really, it appears from the estimate<sup>19</sup> that 30.4% of the amount of subvention is “usurped” by consumers and/or processors of agricultural products, while 69.6 % of subvention amount belongs to agricultural producers.

With the measures for agricultural subventions, it is instructive to analyze the case of milk subsidy. Bonus payment for milk production is a positive, but, in our conditions, simply extorted measure. It is positive because it represents the break with the extensive production increase, with the attempt to surpass lasting the causes of supply deficit. It is forced because, in the conditions of obviously lower supply than demand, milk production subsidy is done with a view of creating additional supply. However, the real causes of supply deficit were not eliminated even with massive production subsidy. The subsidy volume ranged from 15% to 33% of the average purchase price of milk and it was enough to realize supply and demand balance. Even, real milk purchase price<sup>20</sup> increased per rate of 3.48%. Productivity of raw milk also increased per rate of 2.74%, but the physical production volume decreased per rate of 0.79%, annually. In spite of productivity rise, the volume of production was reduced primarily due to the fall of the number of milk cows (drop rate was 3.48% per year on the average). Logically, supply increase could be expected because of the growth of price and productivity, but it did not happen. Production subsidy to 2005, with the rise of milk price (14.4%, per year) in purchase caused the growth of production per annual rate of 0.46%, and, no doubt, the effect of subvention on production volume was positive. Since 2005, the physical volume of production has started to decline continually, due to the drop of relative milk price. In this period, prices decreased 3.8% per annum and production volume per rate of 2.0% so even the growth of productivity of 1.61% could not compensate the fall of the number of milk cows of 3.60%, per year. According to the trends, with low price elasticity of supply (about 0.2) and more elasticity of demand, supply deficit could cause bigger disturbances than real ones on the market of milk and dairy products if

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<sup>19</sup> The estimate is derived based on the pattern  $\frac{dP}{dS} = \frac{-1}{1-\eta/\varepsilon}$ , that  $P$  denote price,  $S$  subventions,  $\eta$  price elasticity of demand and  $\varepsilon$  price elasticity of supply. For mathematical proof see [4].

<sup>20</sup> Milk purchase price that is deflated by the average purchase price of corn, as the most important component of fodder. It would be better to deflate milk price by the index of fodder price. However, our statistics does not record fodder price, not the physical production volume in fodder industry.

there were not “buffer” factors as demand fall<sup>21</sup> (number of inhabitants), import and periodical material intervention.

It is not disputable that the “break” of tendencies in dairy production happened with the end of privatization of manufacturing capacities. Inefficient anti monopoly legislation enabled the high concentration of dairy industry<sup>22</sup> and the monopoly position to one manufacturer. Of course, in the conditions of monopoly, the effect of milk subsidy on production volume was marginalized. In addition, we should add liberalization of the foreign trade and foreign exchange system that enabled open possibilities to milk import and dairy products at dumping prices, and this import did not have an intervention character.

The sector of milk is certainly the best example of contradiction of measures of the intervention-regulatory policy. On the one side, there is subsidy production with the effort to coordinate scare production with demand at the given price level. While, on the other side, milk import and dairy products is enable at dumping prices and monopoly purchase so the growth of production volume is disabled. This is the reason that real milk prices are decreasing.

Although this work does not claim to work out the recommendations of regulatory-intervention policy, the necessity of looking for both short-term and long-term solutions in production and on the market of milk and dairy products impose as an urgent need because market reflections of the cited structure of measures and factors are extremely complex.

As for supporting basic inputs, Serbia has decided for periodical subsidies of chemical fertilizers and diesel fuel. Price subsidy of mineral fertilizers is a usual practice of many countries trying to increase agricultural production. The level of subsidy primarily varies depending on domicile fertilizer prices and the degree of efforts to stimulate production of basic farm crops. No doubt, this measure is one of the most efficient measures that essentially contribute to the growth of production volume. The subvention effects of mineral fertilizers can be evaluated through the relationship of increased fertilizer demand to the potential decrease of production costs and increased yields. Finally, efficiency of fertilizer subsidy amounts to subventions costs in relation to the effects

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<sup>21</sup> Share of expenses of the population for milk and dairy products in the total expenses for personal consumption is decreased from 4.6% to 4.1% from 2005 to 2011.

<sup>22</sup> Only one manufacturer participates in the total milk purchase with 36%.

reached by subventions. Unfortunately, there is no minimum of recording to evaluate the efficiency of fertilizers subsidy. We can talk about efficiency only indirectly drawing conclusions based on the growth of fertilizer consumption per area unit (from 120 to 230 kg/ha), although fertilizer price has been in constant increase in the last 12 years. The price growth of mineral fertilizers is a normal consequence of the growth of oil price and oil derivatives on the world market.

Regarding the fact that the domestic production of mineral fertilizers is stagnant and unstable since the privatization of production capacities, subsidy of fertilizer consumption in proportional relation represented, in fact, indirect import subventions.<sup>23</sup>

Finally, it is important to note that diesel fuel subsidy has no effect on production volume so it is surprising the persistence on this measure, especially if we have in mind the spread appearance of misuse right to subsidy. The basic effects of subsidizing fuel consumption are manifested in reducing production costs. However, having in mind the low share of fuel in the total costs which agriculture buy, it should stop the practice of subsidizing fuel for agriculture, and these resources redirect to subventions, which have expressive production effects.

Purchase subsidy of high quality breeding livestock and seed material is without doubt a justified measure, especially in the efforts to intensify livestock breeding.

Since 2004 the target program of bank subsidized crediting of farmers has been developed. The goal of this measure was a bigger commercialization of farms and their directing to bank resources of capital. However, as with most measures, because of the turn in the agrarian policy and support inconsistency, resources have not been multiplied, therefore, the efficient rural financial market has not been formed. The absence of rural financial markets causes that numerous institutions and funds at the local, provincial and republican levels are not efficient and do not realize aims they were established for.

At the end, but important, we have to consider the question of the efficiency of foreign-trade system and policy. The foreign-trade policy in the field of agricultural and food products of every country are

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<sup>23</sup> In the total consumption, import of mineral fertilizers was 56%.

determined with two moments: a) trade, i.e. balance of payment, and b) efforts to protect its domestic production. Of course, it is not necessary to emphasize how much the policy of stimulating export and the policy of import protection should represent the consistent set of measures. Namely, as the volume and favourable structure of agricultural production are an essential factor, with direct effect on export increase, i.e. import reduction, so without appropriate conditions of disposal of goods for export and the absence of rational elements in the policy of import there is not adequate results in international exchange.

Simply said, in determining the way and volume of export subsidy, everything starts from the balance of payment situation, restrictive measures of importing countries, compensation for lower productivity of agriculture in relation to the countries competitors and the degree of supporting export of competitive products on the world market. In determining the height of subvention, it starts from the real evaluation of effects reached by subvention. Of course, we should always have in mind that import demand is relatively inelastic; therefore, the level of subventions should be defined according to these conditions. Without considering the reasons of real possibilities of subventions, Serbia defined five differentiated rates of export subventions, where the criterion is defined based on the level of processing. It is logical that products of higher phases of processing have the higher rates of subventions because the level of protection in export markets is higher for these products.

Subsidy rates are:

- Beef meat – 15%
- Pork – 10%
- Concentrated milk, butter and cheese – 15%
- Non-concentrated milk and cream – 20%
- Cereals and products – 5%
- Frozen fruits and vegetables – 5%
- Tinned products from fruits and vegetables and juice – 10%
- Sugar – 7%
- Honey – 10%
- Fodder – 5%
- Alcoholic drinks – 5%.

Except export stimuli, additional stimuli are allowed for vine and alcoholic drinks – 5.2%, cereals and products – 6.4%, fruits, vegetables and products – 1.0% meat – 5.7%.

Unfortunately, there are no data for paid subventions according to individual products and groups of products, therefore, it was not possible to evaluate efficiency of export stimuli based on analytical elements already mentioned. However, it is not disputable that Serbia, from the net importer, has become the net exporter of agricultural and food products, since 2005 primarily due to the faster growth of production than demand and export subventions. In addition, it is not disputable that in the procedure of negotiations on joining WTO and EU, Serbia will be forced to change radically the system of direct export subventions so Serbia will have to introduce only the indirect support by means of the system of determining some forms of pricing.

After “opening” Serbia to the world since 2000 and the general market liberalization, its foreign-trade policy and system has been established based on the principle instrument of support to production prices. Import quotas for agricultural and food products has been revoked, while export quotas have been kept for about thirty most important products (wheat, corn, sugar, soybean, baby beef, etc.) in quantities surpassing domestic demand.<sup>24</sup>

With the general market liberalization, Serbia has reduced maximal customs tariffs from 40% to 30% in 2002, and six customs level makes the ad valorem customs structure (1%, 5%, 10%, 15%, 20% and 30%). Except these instruments, seasonal tariffs for some products, which are limited on maximal amount of 20%, are also applied.

It is logical that tariff positions with the highest tariffs (20% and 30%) are the basic agricultural and food products; therefore, the average customs rate for these products is higher than the customs rates for non-agricultural products. (In 2011, unweighted duty rate for agricultural and food products amounted to about 16%, and for the total import it was under 8%).

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<sup>24</sup> Some efficient alternative to import quotas tariff quotas has not been passed for unknown reasons. Tariff and non-tariff quotas can protect efficiently domestic production from excess import.

Serbia has kept variable levies for the most important agricultural and food products as a very efficient and sufficient flexible instrument to regulate import.

Method efficiency is seen in the possibility of continual harmonization of the protection level of domestic production, i.e. consumption, depending on import prices. The level of variable levy is determined according to the importance of products for the domestic market and they are paid for livestock and meat, milk and dairy products, eggs, wheat, oil crops and edible oils, fruits, vegetables and juices. We should remember that Serbia is on the threshold of the inevitable repeal of variable levies (WTO regulations) and that it is necessary to find out an efficient protection system. Judging by these facts, the only efficient alternative is the introduction of non-tariff quotas combined with prescription some forms of pricing.

EU reacted promptly on the “opening” of Serbia and, in 2000, approved unilaterally Autonomous Trade Preferences, exempting import from Serbia of some adding duties except for trout, wine, sugar and baby beef for which the quota is issued. However, in spite of trade reliefs, producers and exporters of agricultural and food products to EU are faced with rigorous procedures and standards for consumer protection and product quality.<sup>25</sup>

The unilateral EU concessions are practically transformed in the bilateral agreement by signing the Stabilization and Association Agreement obligating Serbia to reduce gradually customs duties in the next six years. Rough calculations show that customs load on import of agricultural products from EU is now (in 2013) amounts to 1.7%, on the average, of course, tariff load equivalent is some over and amounts to about 2.5%.<sup>26</sup>

No doubt, signing and implementation of the Stabilization and Association Agreement with EU has exposed agricultural producers to the increasing import competition. In addition, it is certain that the gradual harmonization of the volume of production, quality and phytosanitary standards has opened possibilities for a bigger volume of

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<sup>25</sup> We should remember the EU warning on the origin of products from Serbia (sugar) and import meat ban because it did not satisfy health standards.

<sup>26</sup> Calculations are extremely rough with unclear methodology, but they are a good indication of liberalization of the foreign-trade exchange of agricultural and food products. More details in the study of USAID [7].



exchange of agricultural and food products, the witness of which is the continual growth of export and import of these products.

Besides EU, Serbia has the signed agreements on free trade with the CEFTA countries.<sup>27</sup> The custom concessions, preferential rates custom duties and quotas for agricultural and food products are harmonized with preferential custom duties. Except with the CEFTA countries, Serbia has signed agreements on free trade with Russia, Turkey and Belarus. The agreements with Russia and Belarus are completely applied, therefore custom protection is practically eliminated (about 1%). As for Turkey, the complete liberalization of foreign-trade exchange is not stipulated.

## CONCLUSIONS

Without any intention of working out details, in the technical sense, the regulatory-intervention policy, the intention is to point out the most striking foundations on which a more efficient agricultural policy of Serbia would be based.

Starting from the realized volume and the tempo of agricultural production growth, tendencies in demand for agricultural and food products and the experience of developed countries, it is necessary to define and develop in the long run the principles of market interventions in the conditions of sufficiency of production for every of the basic product. Thus, interventions should include minimal quantities – those, which in the given conditions, do not have the provided disposal of goods. The development of regulatory and intervention policy must be based on the principle that protection be offer to those to whom it was intended.

In close connection with protection of agricultural production is the question of defining the target price as the landmark for direct payments. In determining the target prices, we should always have in mind the character of some products and uncertainty in production, low elasticity of demand and expressed elasticity of supply. These products do exert direct influence on market stability and the stability of livestock breeding. There is the need for these products to introduce the principle of interventions when market price falls or surpass the target price for some percent. Namely, the character of these products enables to exert

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<sup>27</sup> Albania, Bosnia and Herzegovina, Bulgaria, FYR of Macedonia, Croatia, Romania, Montenegro and Moldova.

influence decisively, by material interventions, on the range where market prices move.

The situation essentially differs with other products (industrial crops and livestock breeding products). In essence, production is more stable, demand more elastic, but supply is not elastic, therefore, the function of interventions is essentially different. Interventions should be so outlined to have protection-stabilization character, indirect export subsidy and only exceptional and short-time subsidy of domestic demand. Intervention stated in this way can be very efficient if there is no big span between domicile and export prices. If the price span is significant, intervention can be applied if it is possible to limit efficiently production at the level of domestic demand.

At both first and the second group of products, urgency of outlining instruments and principles for interventions is more than obvious. Non-existence of adequate instruments will have above average market (price) reflections in the conditions of supply surplus and deficit.

Accepted EU and WTO obligations do not give a wide space to protect domestic market from import, on the one side, and barriers on the national border and unavoidable reduction of export stimuli limit sales on the foreign market, on the other side. We can draw the conclusion from this that Serbia is right before of creating instruments, which; on the one side, will protect domestic production, on the other side, it will exert influence on the increased competitiveness on the international market of agricultural and food products.

As for the policy of rural development, it is necessary to coordinate many institutions at the regional and local level so the unified vertical system could function. Generally, programs of rural development are well outlined, relying on development funds and stimulating investments in rural and undeveloped areas. No doubt, investments of these funds contribute to the creation and development of the financial market where agricultural and rural potentials can activate.

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