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## THE COMPETITIVENESS OF AGRICULTURAL PRODUCTS: CASE STUDY OF PLUM PRODUCTION AND SALE\*

Konkurentnost poljoprivrednih proizvoda: studija slučaja proizvodnje i prodaje šljiva

### Abstract

The presented analysis of basic agricultural products, on the example of the fruit growing sector (the case study of plum), with quantitative data on the marketing channels subjects level, points that in the family-owned farms the most common goods turnover is the natural consumption aimed to satisfy own needs, with a low level of marketability and competitiveness. As a measure of success and development of Serbia's agriculture, the data of the fruit growing sector's marketability (the case study of plum) are presented, i.e. the average rate of movement, the manifestation of the variance coefficient around the computed average value of a given activity of the marketing channels. The small agricultural properties have a scattered production, an insufficient sale structure, and the present marketing channels fail to realize a safe placement of the seasonal products. In this research the recommendations are presented for achieving agro competitiveness and a higher export orientation.

**Key words:** *Serbia, production and export of plum, competitiveness of agricultural products, policy*

### Sažetak

Predstavljena analiza osnovnih poljoprivrednih proizvoda, na primeru sektora voćarstva (studija slučaja šljive), sa kvantitativnim podacima na nivou subjekata kanala marketinga, ukazuje da je u okviru porodičnih gazdinstava najzastupljeniji oblik prometa naturalna potrošnja za zadovoljenje sopstvenih potreba. Izražen je nizak stepen tržišnosti i konkurentnosti. Kao meru uspešnosti i razvijenosti poljoprivrede Srbije, prezentovani su podaci o tržišnosti za sektor voćarstva (studija slučaja šljive), odnosno prosečne stope kretanja, koeficijent varijacije pojave oko izračunate prosečne vrednosti određene aktivnosti kanala marketinga. Mali poljoprivredni posedi koji imaju za posledicu usitnjenu proizvodnju, nedovoljno razvijenu infrastrukturu prodaje, usled čega postojeći kanali marketinga ne ispunjavaju uslove sigurnog plasmana proizvoda koji je sezonske prirode. Kroz istraživanje date su preporuke za postizanje agrokonkurentnosti i postizanje veće eksportne orijentacije.

**Ključne reči:** *Srbija, proizvodnja i izvoz šljive, konkurentnost poljoprivrednih proizvoda, politika*

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## Introduction

The basic characteristic of the situation in Serbia's agriculture is the economic failure and a constant decline of the agricultural producers' revenue, manifested in various intensity through pulling out a part of surplus value from agriculture, mainly to the benefit of industry, trade and banking.

Following the reduction of the spending capacity of agricultural producers, their demand for agrarian inputs is also reduced, influencing the agricultural production's extensivity, a stagnant instability of return and the scope of production, a relatively low level of using the capacities of the manufacturing industry's appropriate branches and a still greater decrease of Serbia's agro industry competitiveness on the market.

The agricultural producers of modest size, productive and financial capacities, most frequently select the production orientation and satisfaction of the needs of own households. They transfer an eventual market surplus and their own goods turnover to others – wholesale buyers, those buying-up goods, or selling on the spot.

## Export potential and agro competitiveness of basic agricultural products

A more thorough insight into the structure of the agricultural and alimentary products may be obtained by examining the participation of some of the major agrarian products of Serbia from 2005 to 2011 (see Table 1). From the following presentation we may conclude that corn is dominant in export.

A low added value of any agricultural and alimentary product means an insufficiently developed manufacturing industry (the alimentary, i.e. food industry), automatically pointing to a low competitiveness on the foreign markets. The most exported agricultural products are the primary ones, i.e. those in a raw state, or which “underwent” a low level of processing (see Figure 1). Consequently, such products have a low added value and a low selling (market) value. Such a characteristic of export refers to less developed countries, where a sector potential, the agrarian in our example, fails to be valued in an appropriate manner, since the final product reaching the consumer (i.e. the buyer as the final consumer) has a low sale value, resulting in lower income. The example of raspberry may be stated as one of the major export article. Either being exported in its raw or frozen state, it is a primary agricultural product or a great number of countries disposing of the low-priced working force and similar climate are interested in its production.

Consequently (referring to almost all primary products dominant in our agriculture's export structure) points that Serbia will not be able to maintain its competitive advantage for a long time and thus realize relatively high foreign exchange inflows. Namely, only with the highly processed products the stability of the alimentary products export can be maintained. The orientation to a greater activity of the manufacturing industry in the domestic agrarian sector is set as an imperative necessarily included into the new *Strategy of Agriculture Development* [9].

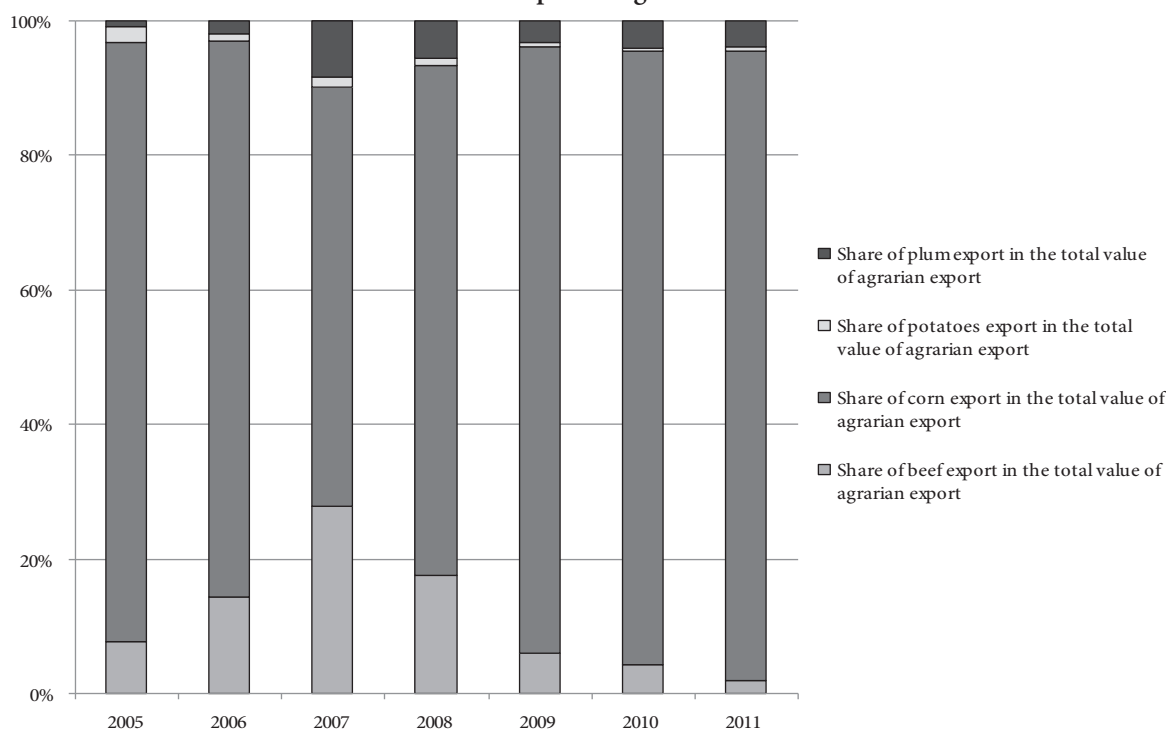
As for the geographical distribution of the Serbian agricultural and alimentary products in the international scope, based on data from UN Comtrade referring to export, following the movements from 2005 to 2011, the

**Table 1: Export of the agricultural and alimentary products from 2005 to 2011 (mil. USD)**

	2005	2006	2007	2008	2009	2010	2011
Value of agrarian export	924.4	1,265.5	1,690.3	1,957.5	1,945.3	2,240.8	2,696.6
Meat and meat products	33.0	76.7	95.6	88.3	64.5	59.5	58.8
Raw beef	9.0	31.0	38.0	30.0	19.0	16.0	9.0
Cereals and products	184.1	291.8	342.5	361.3	477.3	578.6	731.8
Corn	103.0	180.0	85.0	130.0	288.0	335.0	455.0
Vegetables and fruit	262.5	326.0	466.5	479.3	453.1	528.9	657.6
Potatoes	2.8	2.0	2.0	1.7	1.8	2.0	3.0
Plum	1.0	4.4	11.5	9.6	10.4	14.6	18.6

Source: [11]

**Figure 1: Share of selected products in Serbia's structure of the total agrarian export from 2005 to 2011, in percentages**



Source: [2]

groups of the CEFTA region countries and those from the European Union held a major share in the total export, while the other countries realized less than ten percent of the total agrarian export.

A higher inflow of foreign exchange resources based on export may be obtained with increasing prices on the world market, with a quantitatively extended export, with changes in the foreign exchange rate, etc. However, none of the solutions is constant and systematic, sustainable in the long-run, and in some cases there is no control over the given factors (for example, the world prices). The aim should be toward the development of the alimentary industry's capacities, increase of productivity, a harmonization with the provisions and standards of EU and CTO, the application of the international practice and meeting the constantly more strict foreign demands. A higher level of finalizing the exported agrarian products is among the priorities towards a further strengthening the competitiveness, but the possibilities of extending the primary agricultural production should not be forgotten, since such production is the raw material basis of the alimentary industry. Serbia disposes of extremely favorable climatic and geographical predispositions for growing the

organic agricultural products (ecologic, nonconventional), but it is also suitable for cultivating the particular plant and animal species, with a relatively smaller share on the international and world market compared to other products.

In case we tend to pursue a more detailed analysis of the agrarian products production and export, in order to know which agro product in our country disposes of such productive capacities to improve the level of competitiveness in export, we have to analyze some kinds of vegetables, fruit, cereals and meat holding major positions in export and production in Serbia.

In the next period, the concept of the agriculture development will be based on modernizing and changing the production and the turnover structure towards a larger market orientation, with improving the total quantitative and qualitative efficiency of the marketing channels in the sector of growing vegetables, fruit and cereals and the basic cattle breeding products.

The selected agricultural products with the quantitative indices of production and delivery from 2003 to 2012, on the level of the marketing channels subjects, point that in the scope of the family-owned properties the most present kind of turnover is the natural consumption to

satisfy own needs. The level of marketability amounts to 70-80% in the developed countries, while in Serbia such level is low for the total production of the selected products – potatoes, plum, corn and beef amounting to 2,6 up to 35% (potatoes 6,43%, plum 2,6%, corn 13,73% and beef 35%) [6]. The criterion in selecting the mentioned primary agricultural products is the highest scope of production for this sector from 2003 to 2012. The trade of those products is carried out between the producers of raw materials, those producing the alimentary products being finalized in industry, whole sellers selling further those products in an unchanged or slightly changed form and retailers selling the products to final buyers. A number of troubles and difficulties were identified on this way to the final market and consumers - the organizational but also the economic ones. The trend of the decreased turnover through the organized marketing channels is caused both by low revenue and an underdeveloped market and the present conditions of developing the production having low return and an extensive organization.

Fruit growing is one of the major agricultural branches since various kinds of fruit may be produced regardless to both, the land location and quality and the climatic conditions. The regions with the land of poor quality for growing and less appropriate climate are appropriate for fruit in bushes and those with pits, since such kinds of fruit need no special conditions for growth and development. The research carried out in the mentioned period for the specific agricultural products points that plum had the

lowest level of marketability (2,6%). Consequently, a more detailed analysis in this work will refer to the sector of fruit growing on the example of plum.

### Strategies and recommendations for the turnover flows of plum

The raw fruit belongs to agricultural products of uneven quality, easily perishable and with high oscillations in supply and demand (see Table 2). In the aim of overcoming the mentioned characteristics and providing a continuity of supply and meeting the consumers needs, the role and the function of an organized trade in the turnover channels is unavoidable. In an engagement of the necessary financial resources and an organized technological infrastructure, the mentioned products should be bought, with providing the necessary supplies, kept in refrigerators and put on the market following the needs. Consequently, the horizontal and vertical cooperation and integration in the line of supply are highly important in placing fruit on the market.

When speaking about fruit export, plum is still another Serbian great asset besides raspberry. High returns of plum are unsatisfactorily used due to a lack of organization and quality of production, while the opportunity of developing the marketing channels for placing plum would be significantly improved with its production of higher quality (see Figure 2).

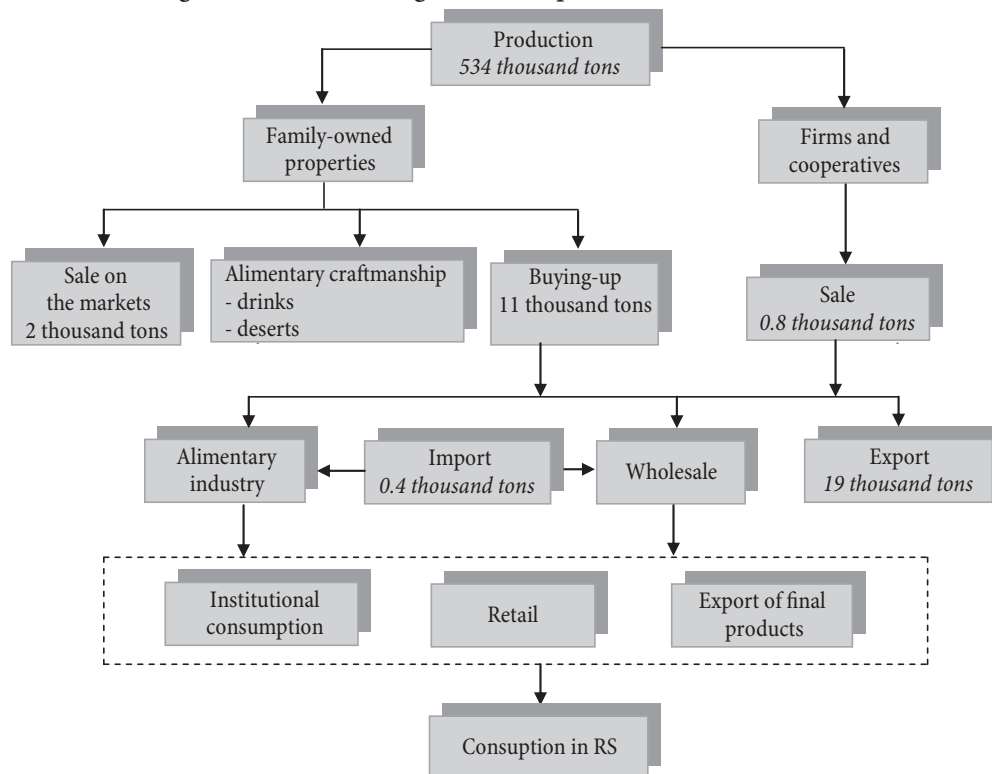
Plum is a fruit of great importance not sufficiently used in its raw state due to processing in a number of

**Table 2: The comparative review of fruit production with the highest share in Serbia (in tons)**

	Plum	Apple	Sour Cherry
2003	570,913	246,138	86,174
2004	561,199	183,571	112,326
2005	304,351	198,030	63,870
2006	556,227	240,320	80,510
2007	680,566	245,228	99,893
2008	606,767	235,601	89,746
2009	662,631	281,868	105,353
2010	426,846	239,945	66,224
2011	581,874	265,676	90,596
2012	391,485	178,713	74,656
<b>Total</b>	<b>5,342,859</b>	<b>2,315,090</b>	<b>869,348</b>

Source: The author's adaptations based on [6]

Figure 2: The marketing channel of plum in Serbia (2003-2012)



Source: The author's own illustration based on [6]

manufactures products, mostly into brandy of specific quality. The average plum production in the mentioned period amounts to 534 thousand tons, tending towards a slight increase at a 7.08% annual rate. The coefficient of variation in the computed line of trend, amounting to 22.7%, point to some variations in production.

Both observed kinds of the production organization point to a positive trend by the average annual rate for the given period amounting to 1.57% for cooperatives and firms and to 7.11% for the family-owned properties. The approximate rate of variance amounting to 22% is characteristic. The family-owned properties are the dominant participants in production, providing 99% of the total plum production. On the basis of the computed variances presented in Table 3, the plum production may be presented by a parabolic trend, taken as appropriate for

a short-term forecast, after analyzing the variances for a linear exponential and parabolic trend. The equation may be presented by the Figure 3.

The plum delivery to the market is carried out through two kinds of turnover - the organized and the direct one. The delivery through the organized channels of turnover amounts in average to 11.8 thousand tons, with a tendency of growth by an average rate amounting to 18.24% annually. The variation around the computed line of trend is expressed, amounting to 43.59% (See Table 4).

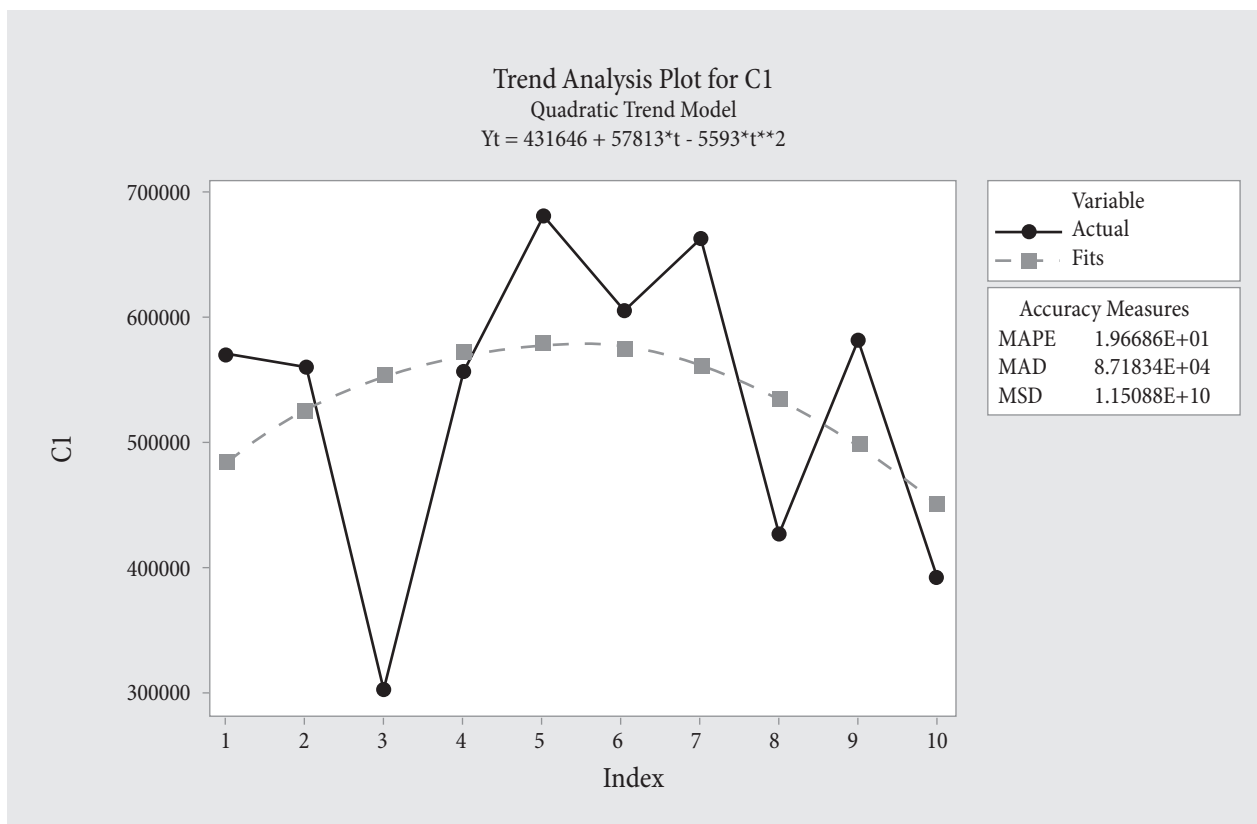
The delivery was carried out differently due to the kind of organization. The buying-of from the family-owned property tends to grow by an average rate amounting to 25.5% annually. On the contrary, sale from the firms and cooperatives has a negative trend amounting to 5.05% annually. The marketability of buying- up compared to the

Table 3: Variance and kind of trend

Trend	Variance
Linear Trend	14,622,817,741.21
Exponential Trend	14,631,270,416.36
Parabolic Trend	12,787,585,408.08

Source: The author's adaptations based on [6]

Figure 3: Trend of plum production



Source: The author's own illustration based on softver Mini Tab.

marketability of sale and the markets the highest rate of variability, amounting in average to 43.9% annually. The family-owned properties have a higher average participation in the structure of the total plum delivery through the intermediary marketing channels, amounting to 93%. The Figure 4 illustrate plum delivery in the Republic of Serbia in the observed period.

The average sale through the direct marketing channel amounts to 2 thousand tons, tending towards a negligible tendency of growth amounting to 0.68% and a variance

amounting to 43.59%. The intermediary kind of turnover is dominant in the total plum delivery, participating with 85% in the mentioned amount.

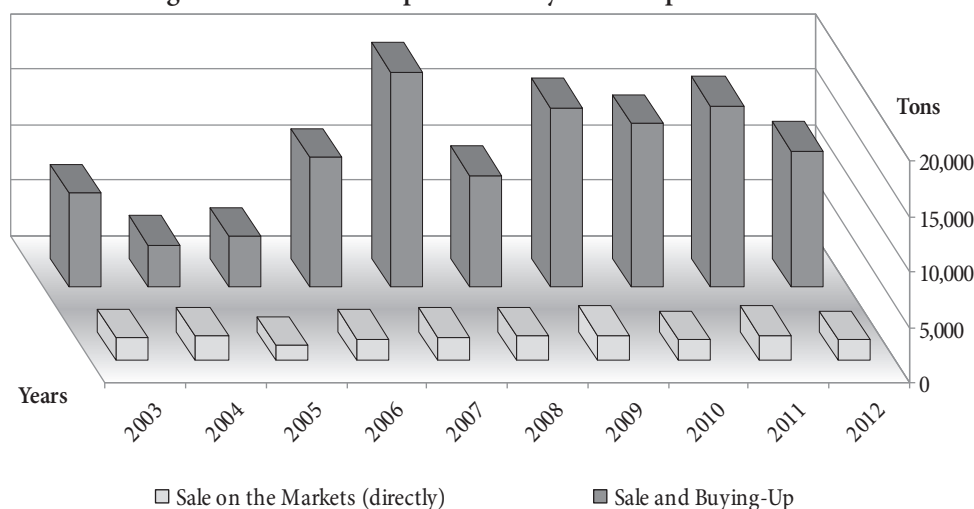
The average marketability of the total plum production, stated without the market, amounts to just approximately 2.2%. The highest total turnover of goods through the mediatory marketing channels amounted to 3.46% in 2010, and the lowest to 0.69% in 2004, without the markets. In the observed period the percentage of goods turnover varied considerably. The orientation to spending plum

Table 4: The plum supply according to the marketing channels subjects on the Serbian market (2003-2012)

Characteristics	Total	
	average	rate %
<b>Production – 000 tons</b>	<b>534</b>	<b>7.08</b>
Family-Owned Property	532	7.11
Firms and Cooperatives	2	1.57
<b>Delivery, Mediate Marketing Channels – 000 tons</b>	<b>11.8</b>	<b>18.24</b>
Family-Owned Property	11	25.5
Firms and Cooperatives	0.8	-5.05
Turnover on the Market, 000 tons	2	0.68

Source: The author's adaptations based on [6]

Figure 4: Movement of plum delivery in the Republic of Serbia



Source: The author's adaptations based on [6]

in the households, and particularly for the production of brandy, led to an extremely low marketability.

In the observed period the firms and cooperatives have much higher marketability in the mediatory marketing channels, amounting to 43.7%, while the marketability in the family-owned properties amounted to only 2.06% (See Table 5). The highest goods turnover of the firms and cooperatives amounted 59.3% in 2006.

The future trend of the total delivery may be presented by a parabolic trend, expressed by the variances in Table 6. The equation and the table are presented in the following illustration.

In Serbia the major importance is on the comparative advantages, and not on the competitive. When it comes to marketability, the one-way trend of both the mediatory and the direct marketing channel may be noticed in the family-owned properties. There is a negative movement

amounting to 6% and besides a positive rate of the production growth amounting to 1.57%, the marketing channels of the small family-owned properties become inferior. The total marketability of the mediatory and direct marketing channels amount to 2.6% (See Table 5), and the positive trend of movement at a rate of 5.84% annually, with a variation amounting to 34.13%. The characteristic of the plum turnover process is that a major part of the produced good (97.4%) is used in the property itself, through the natural consumption. In the firms and cooperatives the plum is applied for own needs in its raw and processed state, while in the family-owned properties is mostly used for the alimentary craftsmanship - marmalades, brandy, jam, etc.

We may conclude that 0.38% of the total plum production is realized through the direct marketing channel. The total sale through the mediatory and direct marketing channels

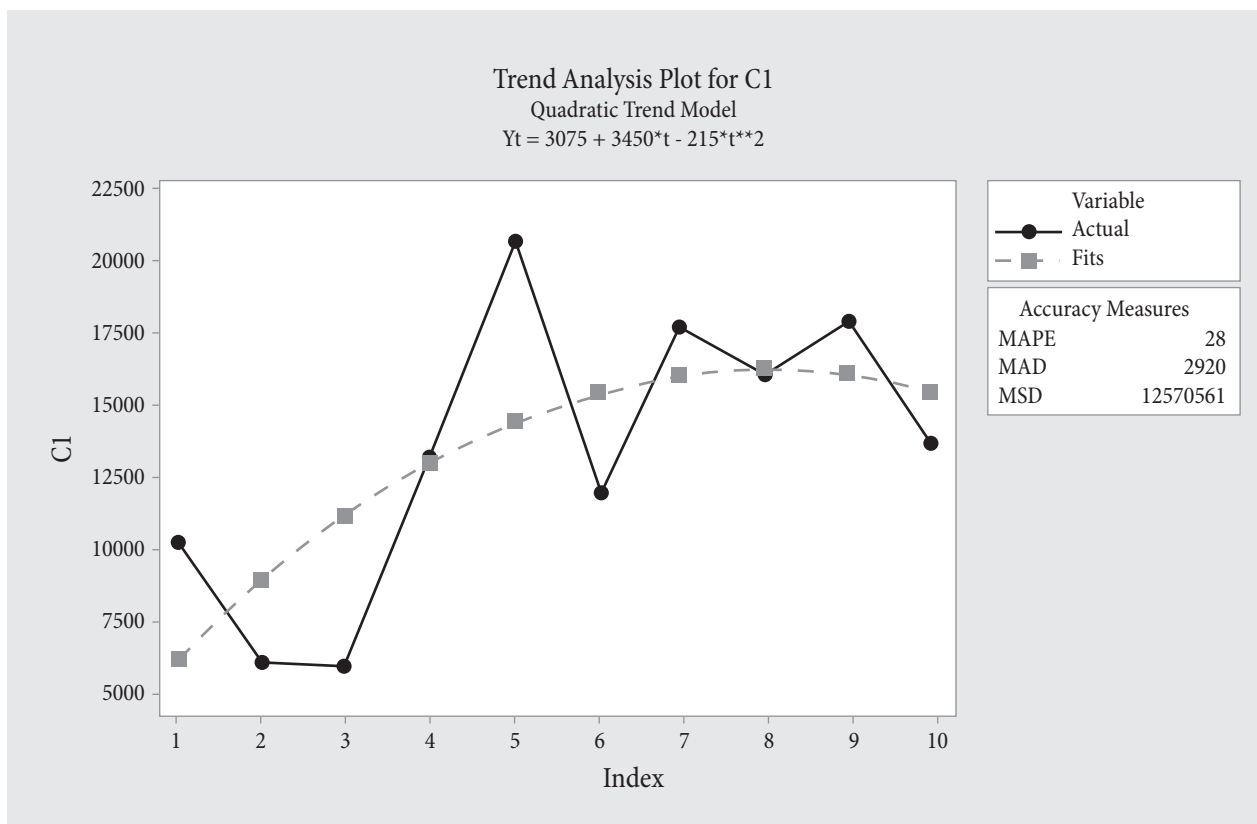
Table 5: The Marketability of plum according to the marketing channels subjects on the market of Serbia (2003-2012)

Characteristics	Total	
	average %	rate %
*Marketability	2.6	5.84
Total Marketability of Family-Owned Properties	2.45	4.8
Marketability of Firms and Cooperatives	43.7	-6.52
Marketability of Family-Owned Properties, Directly	0.39	-6
Marketability of Family-Owned Properties, Mediatory	2.06	17.17

\*The total marketability is expressed on the market  
Source: The author's adaptations based on [6].



Figure 5: The trend of plum delivery



Source: The author's adaptation based on softver Mini Tab

has a trend of growth at an average rate amounting to 13.4% and a coefficient of variation amounting 38.06%.

In the turnover process 40% of plum from the cooperatives and firms is distributed to the trade enterprises and only 2% from the family-owned properties. The total quantity coming to the retail stores amounts to 2%, while the rest is used in the manufacturing capacities, processed in various kinds of manufactured goods. The production of the manufactured goods from plums is carried out through the natural consumption into retail. In the peasant properties it is used for the alimentary craftsmanship, i.e. for the production of brandy, jams and marmalades. The plantations sell their market surplus to trade firms and to industry for fruit processing.

After a mediatory placement of plum amounting to 11,8 thousand tons in average in the observed period, the marketing channel continues its export amounting to 19 thousand tons, while approximately 0.4 thousand tons were imported (See Figure 2). The export of plum id highly variable amounting to 44.38%, compared to the computed line of trend the total sale on the domestic market varies to 38.6%, while the coefficient of the production variation amounts to 22.73%. We may conclude that the marketing channels are disorganized and inconstant both on the domestic and the export market.

After China, Serbia, Romania and the USA are the countries being the global leaders, with the highest production amounting to approximately 600,000 tons each. Serbia is

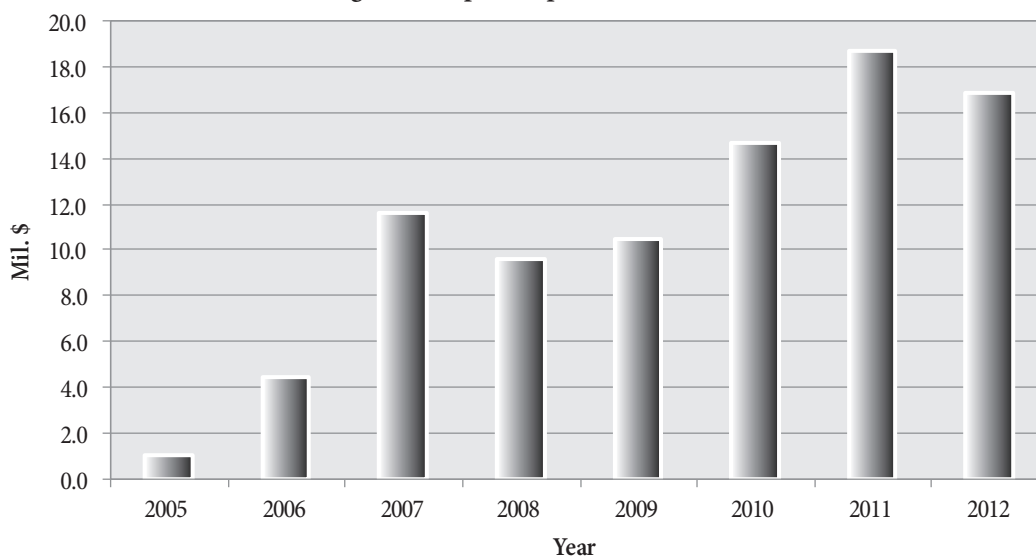
Table 6: Variance and type of trend

Type of Trend	Variance
Linear Trend	16,673,331.05
Exponential Trend	18,825,822.98
Parabolic Trend	13,967,290.14

Source: The author's adaptations based on [6]



Figure 6: Export of plum (mil. USD)



Source: [11]

the sixth world exporter of plum and holds the fifth position in exporting prune. The EU is the major importer (Great Britain, Germany and Holland) (See Figure 8), while the major exporters are Spain, the USA and Chile. In 2009 the world average price amounted to approximately \$ 1.04/ kg [1].

Plum is traditionally exported From Serbia as a manufactured product. The export of raw plum to the Russian market started in 2004. In 2009, 2/3 of the total export was delivered to Russia, and accordingly it became the major market for the Serbian plum. The other important importers are Austria, Italy and Croatia. A part of raw plum is later transformed into brandy. The major part of export is carried out in cardboard boxes weighting 10-15 kg. We may conclude that Serbia doubled its export of raw plum and prune from the amount in 2005 and 2009 and that the value of the exported plum is constantly increasing (See Figure 6).

Also, the trend of the plum export is presented by a parabolic trend (see Figure 7). The values of the variances determining the mentioned trend are presented in Table 7.

The plum production in Serbia is an example what happens in the specific production without a state phytosanitary system as a part of the system of public interest - a precondition of a profitable production and development. Due to its unfavorable situation, Serbia disposes of lowest quality of plum intended for export, accordingly realizing a lowest price.

Serbia is characteristic by the old seedings, owners of the family-owned properties, which use plum mainly for the production of brandy. The high costs of production are the result of uneven returns and inadequate quality, and the sale through mediators or buying-up is mostly applied. The future trend should contain investments into new technologies of breeding, thus reducing the expenses of production, increasing the quality of revenue and the number of organized producers.

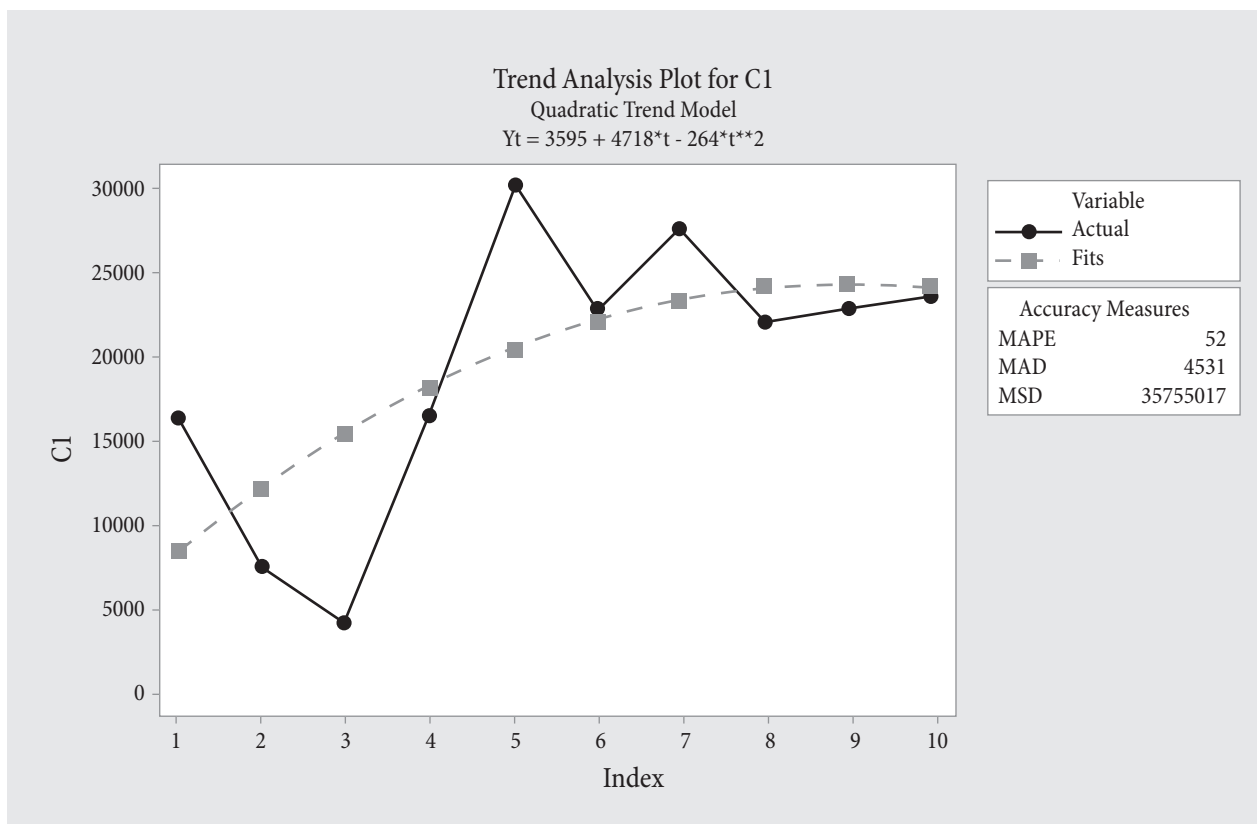
Serbia disposes of good comparative advantages for plum production, with its fertile land, convenient climate and the farmers with appropriate knowledge. The plum production varies due to the lack of cultivation and

Table 7: Variance and type of trend

Trend	Variance
Linear Trend	39,427,875.86
Exponential Trend	47,647,621.41
Parabolic Trend	35,755,016.95

Source: The author's adaptations based on [6]

Figure 7: Trend of plum export



Source: The author's adaptation based on softver Mini Tab

protection, and occurs hyperproduction which leads to oscillations in production. Following an irrational picking, a large quantity of plum is destroyed or processed into brandy. From the total plum production, amounting in average to 400-45000 tons, 80% is processed into brandy. A small part is manufactured into prune (about 200 tons according to statistical data, although it is estimated that some farmers and households may process still 600 to 800 tons, not being statistically computed.) and the rest is used for alimentation. A smaller part of fruit is processed into jams, marmalades, juices, jellies, etc. [1].

In the line of plum production can be expected a larger association of the family-owned properties, i.e. the creation of trading objects aimed to an organized storage and gathering plums. An increased seeding and export of raw plum should be realized, as to take a full advantage of the provision of the Agreement of Free Trade with the Russian Federation, not being at any other country's disposition (see Figure 8).

The value lines of plum tend towards selling raw fruit, the production of brandy, the raw plum processing

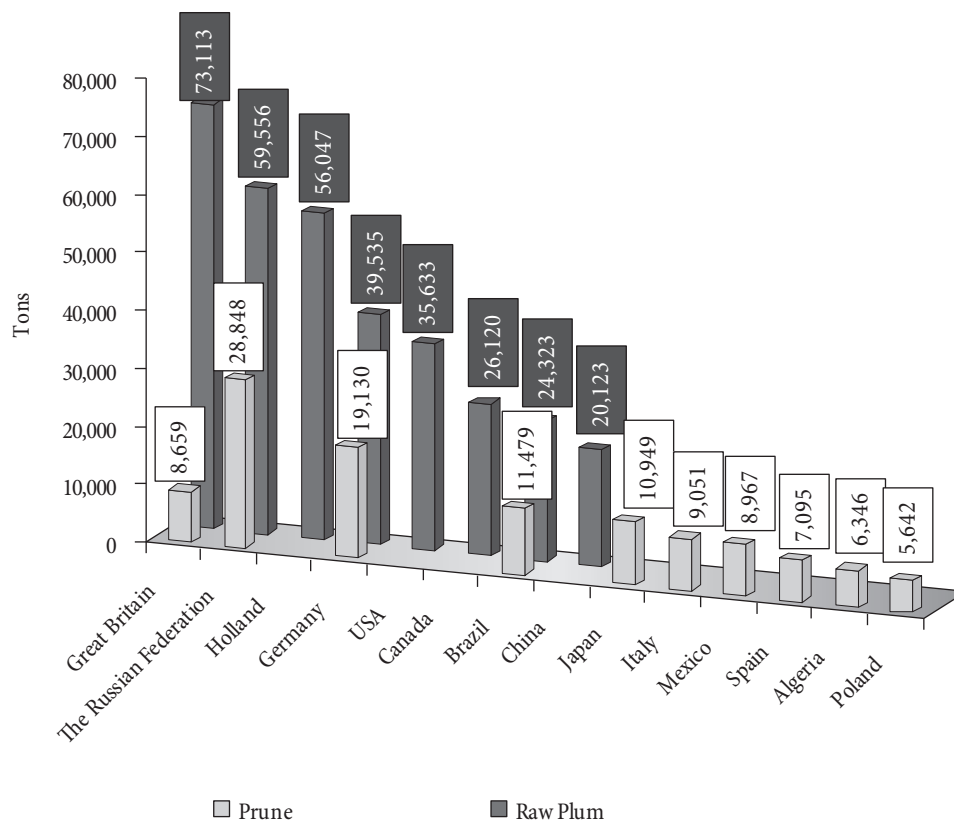
for the needs of production, fruit brandies, prune, jams, puree, compotes, etc.

### The important role of state in stimulating the agro competitiveness

One of the reasons of building up the present economic structure and its nonproductive use was a great illusion that through a natural potential of agriculture - with low-priced products, the measures of the social policy may be infinitely stimulated, and by a constant draining of incomes from agriculture the initial capital for the industrial development may be generated. As a rule, the producers had no appropriated conditions for an accumulative price for their products, and instead of taking care about protecting the most destitute categories of its population through the measures of the social policy; the state applied the linear control of prices of the basic agricultural and alimentary products.

The experience of the developed countries points to the effort to concentrate some of the resources for the

Figure 8: Major Importers of Raw Plum and Prune (in tons)



Source: [1]

agriculture financing. Those resources are mainly in banks - capable to finance such a specific branch of the economy. Accordingly, most European countries have the agrarian banks, mainly operating in the financing the agricultural production (France, Holland, Denmark, Greece...). The state greatly influences the development of the agrarian banks and their qualification to carry out the agrarian policy.

Due to a long process of production and successive investments, the turnover of capital in the agricultural production becomes decelerated. Accordingly, the agricultural production is obliged to run into debts, and the state holds a great responsibility regarding the interest rates. The state should assist in the reconciliation of the domestic products quality with the EU standards, and to support the horizontal and the vertical integration of the producers and the meat production [10].

The state should be interested in the large agricultural properties through approving favorable credits for the lands buying-up, the arrangement of land, introducing the irrigation systems, etc. The large agricultural properties

and those including 5-8 hectares may contribute that our agriculture becomes a powerful economic factor in the country's development and also a great exporter of food to the well-known and eminent world markets.

The free market with managing risk is an alternative that mostly generates the problem of prices in agriculture. The efficiency of the agricultural production may be achieved if the farmers can share the risk (referring to the variations of return of prices and revenue) with other groups in society. The risk management may be improved by a limited government's intervention, including insurance, forward of the market, futures contracts, and the financial market institutions capable to reduce the risk.

Through its stimulative measures of the credit and development policy the state should offer a great support to all the economic subjects, and particularly in case where the present comparative advantages could be transformed into the competitive ones. The implementation of an appropriate credit, legal, customs and foreign exchange policy should be a role of the state.

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