

## Methodology of application of the systematic and derivative analysis of the conditions of the local raw materials market development

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**Abstract.** The authors have developed in the article the methodology of the systematic and derivative analysis of local mono-product markets development, which methodology is based on conceptual understanding of the results of development of these markets as a total of derivative forms reflecting the interaction between producers of agricultural products, parties of its industrial processing, investors, and owners of special infrastructure objects. This methodology targets delimiting and evaluating the three subsequent understandings of the efficiency of the studied markets development: the organizational, economic, and social ones.

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### Introduction

The essence of the systematic and derivative analysis resides in sequential stage-by-stage study of the efficiency of operation and stability of the crop products market, starting with the organizational efficiency, then the economic one, and, finally, the social efficiency. In elaboration of the previously obtained scientific results [1-3], the heuristic potential of the systematic approach in this methodology is complemented with the capacity of the theory of derivatives. The algorithm of the systematic and derivative approach is determined by the circumstance that the study object is the crop products market, which has a number of singularities conditioned by organizational, economic, and social factors [4-5].

### Methodology

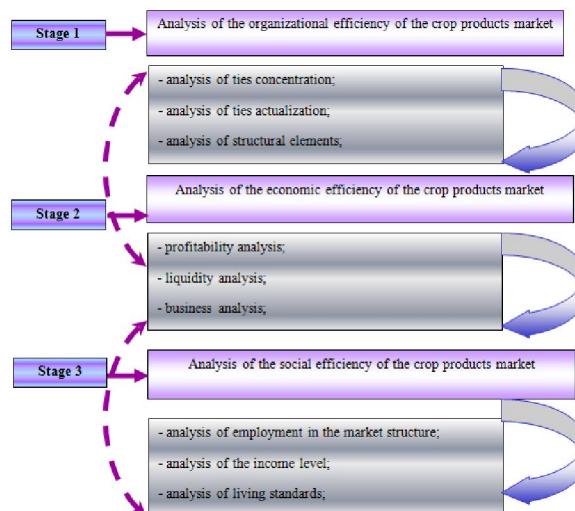
The methodology of conducting the systematic and derivative analysis (Figure 1) targets delimitation and evaluation of the three sequential understandings of the efficiency of the studied markets development: the organizational, economic, and social one [6-7]. The initial stage of the algorithm is the analysis of the block of indicators of organizational efficiency of the crop products market development. One of the main indicators in this block is the ratio of concentration (branching) of ties related to import and export of crop products [8]:

$$K_p = \frac{T}{M},$$

where T is the number of regions, with which the ties related to importing (exporting) agricultural products are established;

M is the total number of regions.

Calculation of the mentioned ratios was made by the regions belonging to the North Caucasian Federal District (NCFD), without reckoning the ratio of the whole macroregion.



**Figure 1. Algorithm of the systematic and derivative analysis of the conditions of the local crop products market development**

### Body of the work

At the first stage of approbation of the methodology of the systematic and derivative analysis of the local mono-product market development conditions according to the declared above algorithm,

we will evaluate the organizational efficiency of the crop products market.

Among all subjects of the NCFD, only the Stavropol Region has a wide network of crop products sales to the regions of the Russian Federation, and the other six regions mainly purchase them from other regions [9]. Due to close location of the large number of crop consumers, the transaction expenses at crop sales in the Stavropol Region are as low as possible [10]. The lowest ratios of concentration of ties related to export of crops within the regions of Russia are observed in the Karachayev-Cherkessian Republic (KCR), from which the crops are exported only to two regions (Ingushetia and Adygea). Such supplies are quite reasonable logically; however, taking into account the low level of self-sufficiency in this republic, we can conclude that entrepreneurs find it more profitable to sell the crops to other regions (even taking into account the transportation costs), rather than to sell them in the local market [11].

The ratio of branching of the ties related to crops import into the Stavropol Region was equal to 0.078 in 2005, 0.101 in 2010; 0.078 in 2011, 0.089 in 2012, and 0.112 in 2013. During the researched period, the ratio of concentration of the ties related to the products import grew by 43.5%. This ratio grew up in the Dagestan Republic and KCR, i.e. the number of grain drops supplying regions increased. It is to be mentioned that KCR and Dagestan import bread grain crops, and the Stavropol Region imports elite seed or forage grain crops.

The other line of organizational efficiency of the crop products market is the analysis of the structural elements. The overall efficiency of the market system depends on the number of infrastructure elements and their organized balanced interaction. This balance is mainly determined by the organizational structure, which is represented in the crop products market by commodity exchanges, elevators, and processing enterprises [12].

As of year-end 2013, there were 593 elevators and grain depots registered in Russia, 27 of which were located in the NCFD, namely 20 in the Stavropol Region, and one each in the Kabardino-Balkarian Republic (KBR), KCR, the Northern Ossetia, and Chechnya. Existence of elevators in regions ensures the possibility of fully fledge sale of the produced products. The near location of grain depots to the agricultural producers reduces transaction expenses, which makes the price competitive [13]. As of year-end 2013, there were 92,093 agricultural products processing enterprises registered in Russia, 2,281 of which were located in the NCFD. The availability of the infrastructure elements in the region has not only the economic effect, but also social one, as along with the growth of

the regional gross product, there also is the increase of the number of work places, the improvement of the population's life level, the wage hike, and, consequently, the replenishment of all-level budgets.

The second stage of the systematic and derivative analysis of the studied market development includes the analysis of the economic efficiency of the crop products market development. One of the main indexes of economic efficiency is the profitability (Table 1).

The final stage of the systematic and derivative analysis is the determination and calculation of the system of social efficiency indexes, which include both the characteristic of the labor resources of the crop products market, and the living standards, and the supply of crop foods to the population.

An important index of the social evaluation of the crop products market efficiency development is the gross income per capita. In 2012, 23,453 rubles were gained for one employee in the agribusiness sector in Russia, 19,465 rubles in the NCFD, and 21,841 rubles in the Stavropol Region. During the whole studied period, the incomes increased 2.5 times on the average within the considered territories. Closely related to the above-provided index, the index of average headcount of employees is, which during the period 2005-2012 decreased in Russia by 9.4%, and in the Stavropol Region by 3.9% [14].

**Table 1. Grouping the regions of the NCFD by profitability of crops production, %**

The groups of regions of the NCFD by profitability of crop products, %	The number of regions in the group	The average profitability (loss ratio) in the group, %	Expenditures per 1 dt of crop products, man hours.
Less than 10	4	4.2	4.2
10.1-15	2	12.6	4.5
15.1-20	1	15.3	4.7
Above 20	-	-	-
Total	7	11.2	4.5

### Conclusion

As a result of practical approbation of the methodology of the systematic and derivative analysis of the crop products market development, we can conclude that the growth of the gross crops output is observed, with the crop farming being more extensively developing in the southern regions of Russia. In view of the increase of the crop products output per a square unit, the expenditures per unit of the produced products are reducing. For example, the expenditures per 1 ruble of produced crop products in Russia decreased by 7.7%, in the NCFD – by 11.4%, and in the Stavropol Region – by 7.2%. The profitability of the grain crops production in Russia equaled to 36% in 2012, where in the NCFD it was

only 4.48%, and in the Stavropol Region – 18.9%. The main index of intensity describing the development of the crop products market is the production of the gross crop output per one employee in the agribusiness sector. Between 2005 and 2012, this index increased 2.36 times in Russia and equaled to 214,800 rubles in 2012 per one employee in the agribusiness sector.

### **Summary**

The result of supporting the heuristic potential of the systematic approach with the cognitive capacity of the evolutionary theory and the theory of derivatives is the systematic and derivative approach to the analysis of the local crop markets development conditions. The methodology of the modern systematic and derivative analysis is based on the understanding of the results of development of these markets as a total of derivative forms reflecting the interaction between the following entities: producers of crop products, parties of their industrial processing, investors, owners of the social infrastructure objects, etc.

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