Transaction Analysis of Agrarian Sector

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Abstract. The Russian agrarian market shows a difficult situation. We research this market with the institutional point. The food chain is rather long. We can see the following subjects: "farmers – manufacturers – wholesale merchandisers – retailers – ultimate consumers". We can't deny "egoistical" motive of each subject to increase his own utility (and this idea is under the neoclassical paradigm). If we speak about the first four subjects, this utility is in the desire to sell the product to the following link in a chain at higher price. We can consider such desire normal if the price extra charge at each stage of the agrarian chain doesn't exceed on average 5% over the cost value (in one of the reports the President of Russia has said such trade extra charge as "normal" profitability for food sellers). Meanwhile, we see an essential distortion at the stage "farmers – manufacturers". We suggest to consider this phenomenon through the institutional theory which operates with categories "contractual relations", "behavioral opportunism", "transactional costs". The companies-manufacturers often hold a monopoly position at the local markets. As a result farmers have no opportunity to realize a product at reasonable price. Thus, production of a qualitative, environmentally friendly and healthy product becomes almost impossible. Farmers have no motivation to produce a qualitative and safe product, and in general to produce it. The efficiency of contractual interactions of a food chain is low already on start. Thus, researching the agrarian market since 2015, we have come to a conclusion concern such phenomenon as "a transactional rent". This category has been introduced for scientific use. Using this category we point to the institutional imperfection of the agrarian market. More over in the article the we make quantitative analysis using developed technique. It allows to estimate the level of transactional costs at each stage of food chain.

1. Introduction
The general task of the agrarian sector is achievement of food security. According to the Russian President, food security is among the priorities within the Scientific and technological development strategy [1]. Food security is the difficult multidimensional category meaning such state of the economy when basic needs in qualitative and safe food are satisfied (mainly at the expense of internal resources). There are following indicators of food security: availability at price, availability at quantity, safety and the level of regional self-reliance. [2].

2. Literary review
The transactional analysis is an integral element in the theory of contractual relations. With the development of the neo-institutional contractual theory in the 1970s, Macneil, I was the first scientist who classified contracts. According to his interpretation, contracts could be considered as “mini-societies with a wide range of standards, not limited by the exchange framework.” [3]. Macneil’s
classification identifies classical, neo-classical, and relational types of contractual relations. Classical type of contracts is characterized by discreteness, comprehensiveness of the agreement, and transparency of all the further circumstances; it implies anticipation of different scenarios. Classical contract is a short-term agreement based on formal clauses. As for long-term contracts, their typical characteristics include the condition of uncertainty which is in contravention of the transparency condition. Macneil, I. classified long-term contracts as neoclassical, implying incompleteness of any agreement.

The issues of opportunism and the transaction costs reduction are covered by the works of Williamson, O. According to the cognitive map of contracts introduced by him [4, 5], these questions should be considered within the “effectiveness” sector.

Hodgson, G. developed his special approach, according to which contractual relations are considered as the ownership transition process, not only as the bilateral transfer of goods, finances or service [6].

Jensen, M. and Meckling, W.M. in their works paid special attention to the factors having negative impact on contractual relations effectiveness, such as information asymmetry, and behavioral opportunism [7]. According to Hart, O., incompleteness of contracts is majorly caused by these factors [8].

Among the Russian studies on the contractual relations efficiency we can single out the works of Auzan, A., Bendukidze, K., Benz, D., Kozlova, E., Kudryashova, E., Kuzminov, Y., Oleynik, A., Popov, E., Silova, E., Tambovtsev, V., Shastitko, A. and Yudkevich, M; e.g. Benz, D., Kozlova, E., Silova, E. demonstrated the linkage between opportunism, the quality of the corporate institutes, and the inadequacy of contractual relations [9].

The issue of contractual relations has recently joined the economic science. The theory of contracts started to develop within the neo-institutional course. However, the issue of food security has been a major concern of the scientists for a much longer period. Even the physiocrats headed by Quesnay, F. considered farming as the general source of wealth; they called only labour in agriculture productive, unlike any other “fruitless” work. Taking into account that the surplus product is produced directly by the farmers and provides welfare of the whole society, we can consider agriculture as the main sector of the economy [10]. Malthus, T. was the first scientist paying attention to the issue of food security on the national level. He noted the danger of the Earth overpopulation, bearing in mind the declining soil fertility law [11]. He pointed out the necessity of the marriage and birth rate regulation.

The problems of the modern world were caused by the unprecedented population growth in the end of the 20th century. The biggest numbers of birth rate were demonstrated by the developing countries, which have resulted in multiple energy crisis along with the sharp increase in ecological problems.

In the work “After the green revolution” Conway, G. and Barber, E. determine food security as unimped access for everyone to the sufficient quantity of food allowing to lead full active lives. The main obstacle to the implementation of food security, according to the researchers, is the lack of energy resources, especially in the developing countries. State policy aimed to support agricultural sector, poverty alleviation, and birth control are described as the solution to the problem [12].

Gorbacheva, A. and Kupchenko, A. propose the following definition of food security: the country’s capacity by means of its own production to provide its population (prioritizing the poor) with access to qualitative foodstuffs sufficient to support life, including regulation of import providing diversity and extending the range of food [2]. This approach postulates the key role of the Government in the implementation of food security. At the same time Gorbacheva, A. and Kupchenko, A. define the following components of food security: 1) physical accessibility of foodstuffs; 2) affordability of food; 3) safety and quality of food.

According to Mikhaylushkin, P. and Barannikova, A., food security consists in well-resourced ability of the country to fully satisfy nutritional needs of all the population groups sufficiently to support and reproduce life independently of internal and external challenges, supply and demand, and market conditions [13].
The authors described above gave consideration to the issues of food security. However, they didn’t study the factors causing the reduction of the contractual relations efficiency in agriculture. The problem of a long agrarian chain, accompanied by opportunism and transactional costs, remains to be explored.

The issue of the agrarian chain was raised by the Russian researchers Zinich, A. and Stukach, V. Nevertheless, their work concerns only one participant of the agrarian chain, the small-scale farmers [14].

The transactional costs as a category were induced by Coase, R. in 1937. According to his determination, transactional costs are the result of the price mechanism usage, exchange transactions on the open market, and market costs [15].

Dalman, K. specifies the definition of transactional costs with information costs, negotiation costs, decision-making costs, and contract implementation costs [16].

Many works of the Russian researchers also study transactional costs, e.g. Shastitko, A. regards them as “costs of the resources, for instance time, money, labour etc. utilized to organize, adapt and regulate the performance of the obligations raised during the process of expropriation and appropriation” [17].

Behavioral opportunism is another category developed by the researchers within the neo-institutional school of thought, such as Jensen, M. and Meckling, W. who placed emphasis on factors affecting contractual relations efficiency, for instance asymmetry of information, and behavioral opportunism [7]. Hart, O. named these factors as the main preconditions for the contract incompleteness [8].

Innovativeness of the contractual relations efficiency in agriculture lays in: 1) the work devoted not to contracting, but to the efficiency of contractual relations; 2) the work introduces the methodology of the transactional analysis within contractual relations; 3) all the theoretical categories and methodological instruments are to be tested on the agrarian market. Besides, we will establish relationship between the issues of food security, contractual relations efficiency, excess transactional costs, and opportunism.

3. Materials and methods

Let’s give definitions to the terms "contractual relations in the agrarian sector" and "contractual relations efficiency in the agrarian chain". Contractual relations in the agrarian sector could be identified as a special type of the economic relations between at least two subjects concerning purchase and sale of foodstuff on the basis of developed institutes system. As for contractual relations efficiency in the agrarian chain, it can be described as an ability of these relations to satisfy economic interests of the subjects involved in these relations. These relations are based on distribution of ultimate agricultural product’s price. To put it another way, high efficiency of the contractual relations assumes optimum price which lets harmonize interaction between all the five subjects [18, 19].

Let’s suppose that farmers, manufacturers, wholesale merchandisers and retailers wish to maximize selling price. As for ultimate consumers, they are interested in minimum price. Minimum price allow the consumer to maximize his usefulness. At the Figure 1 we can see pricing of food products.

We can see that the realization price of \( i \)-agent becomes, some kind of, prime cost for the \( i+1 \) – agent

\[
C_{i+1} = C_i + X_i
\]

where \( C_i \) – prime cost for \( i \)-agent, \( X_i \) – trade profit for \( i \)-agent,

\[
C_{i+1} \quad \text{prime cost for } \text{\( i+1 \)-agent.}
\]

As a result the ultimate consumer buys production at the price of \( P_4 \):

\[
p_4 = C_4 + X_4
\]

where \( P_4 \) – the ultimate price, \( C_4 \) – prime cost for retailer,
$X_4$ – trade profit for retailer.

As the studied chain consists of five subjects, the number of price growth stages is, at least, four.

Let’s consider that the trade profit at each stage includes both a normal level, and an extra level:

$$X_i = X_i^{\text{norm}} + X_i^{\text{extra}}$$  \hspace{1cm} (3)

where $X_i$ – trade profit for $i$-agent,

$X_i^{\text{norm}}$ – normal trade profit for $i$-agent,

$X_i^{\text{extra}}$ – extra trade profit for $i$-agent.

\[
\alpha + \beta = \chi. \quad (1)
\]

\[
\text{Figure 1. The subjects of the contractual relations in agrarian sector and pricing stages. The Source: Evaluated by authors.}
\]

Let’s consider that the behavioral opportunism of each of four contractual relations participants (apart from the consumer) is evident in a possibility of realization the product at the price containing an extra trade profit.

The long agrarian chain obviously predetermines high cost of a product. Length of the chain generates imperfection of the contractual relations, in particular transactional costs.

Transactional costs in the agrarian sector are the costs causing decrease in efficiency of the contractual relations in the agrarian chain "farmers – manufacturers – wholesale merchandisers – retailers – ultimate consumers" [20].

Existence of transactional costs is quite normal phenomenon. Therefore if we speak about imperfection of the contractual relations, we should mind extra costs. In other words, extra transactional costs are losses in welfare of subjects of the contractual relations of an agrarian chain because of imperfection of the institutional environment. Decrease in welfare of each subject becomes key negative result of transactional costs in an agrarian chain.

It is difficult to estimate the transactional costs quantitatively. Let’s estimate it indirectly using the quantity of extra trade profit (through ratio on sales – ROS). The simplified formula of its calculation looks follows:

$$\text{ROS} = \frac{\text{PF}_{\text{gross}}}{\text{TR}} = \frac{Q}{Q} \cdot \frac{P - C}{P} \cdot \frac{C - X}{P} \cdot \frac{X}{P} \cdot \frac{X^{\text{norm}} + X^{\text{extra}}}{P}$$  \hspace{1cm} (4)

where $\text{ROS}$ – ratio on sales,

$\text{PF}_{\text{gross}}$ – gross profit,

$\text{TR}$ – total rent,

$Q$ – quantity of product,

$P$ – price,

$C$ – prime costs,
$X$ – total trade profit,  
$X_{\text{norm}}$ – normal trade profit,  
$X_{\text{extra}}$ – extra trade profit.

Thus, through excess ratio on sales over normal level we can find the level of behavioral opportunism and the level of contractual relations efficiency.

4. Results
The result of calculation ROS of 150 enterprises of Chelyabinsk region is shown in the Table 1.

| № | Kind of Agrarian Business | The Number in Agrarian Chain | Ratio on Sales (ROS), % |
|---|---------------------------|------------------------------|------------------------|
| 1 | Cultivation of cattle     | 1                            | 18.6 22.4 21.6         |
| 2 | Vegetable growing         | 1                            | 56.7 48.2 49.7         |
| 3 | Cultivation of grain and leguminous crops | 1 | 6.7 5.1 4.9 |
| 4 | Production of bread and flour confectionery of in continuous storage | 2 | 22.4 13.4 11.2 |
| 5 | Production of flour from grain and vegetable crops and ready flour mixes and dough for pastries | 2 | 9.6 9.7 10.6 |
| 6 | Production of chocolate and sugary confectionery | 2 | 14.6 12.4 12.9 |
| 7 | Wholesale trade in sugar and sugary confectionery, including chocolate | 3 | 2.9 – 3.6 – 2.9 – |
| 8 | Wholesale trade in other foodstuff | 3 | 9.2 7.9 8.9 |
| 9 | Unspecialized wholesale trade in the frozen foodstuff | 3 | 0.1 0.2 0.15 |
| 10 | Retail trade in products from meat and fowl | 4 | 11.3 4.3 9.8 |
| 11 | Large retailers           | 4                            | 5.6 6.3 6.9            |

The Source: According to the Financial Reporting of the enterprises.

We can see following results of calculation. Not all links of the food chain show behavioral opportunism. The companies-manufacturers can abuse the situation in the market, but only if it is large business. As for small companies the level of its opportunism is normally. Even retail trade isn't extra profitable. High level of opportunism is characteristic of wholesale merchandisers.

5. Materials and methods
The low efficiency of the contractual relations in agrarian sector is defined not only and not just by length of the chain, but also a number of institutional problems. During 2015-2016 authors have made the research about agrarian sector in Chelyabinsk region with financial support of President’s grant. Authors made to the following conclusions.
First, new economic and geopolitical calls demand creation of new rules and institutes, more improve institutional environment. There is no certain norms and rules regulating food production, for example, the requirement to conditions of keeping animals in the personal farms, agroinsurance mechanisms. The institutional environment differs in a certain lag effect and depend on "the previous way of development" therefore its change demands a long time and system approach.

The second problem is "institutional traps". These "traps" can be considered as "steady, but inefficient norms". These inefficient norms lead to decrease in efficiency of the sector in general. As for example, we can speak about the mechanism of price control. This mechanism affects only trade margins of retailers, but doesn't mention the price of other links.

The third institutional problem consists in discrepancy of some institutes (for example, discrepancy and blurring in regulation of legal forms of business, both large, and small). Property structure of large agricultural producers is not transparency. Meanwhile, large business prevails in the food market.

All mentioned problem creates the fourth problem connected with imperfection of the contractual relations in the sector. Too long contractual chains lead to the repeated unreasonable growth of the final price for ultimate consumer. And agrarian business revenues are redistributed unevenly between subjects of the contractual relations therefore the efficiency of the sector in general decreases.

As a result we offer the term "transactional rent" to describe the existing imperfections. Transactional rent is the income gained as a result of imperfection of a market mechanism redistributed in favor of one of contractors while there are all bases to believe that this income has to belong to the second contractor in condition of perfect market.

The fifth institutional problem is the high administrative barriers in the food market. The solution of this problem is search of optimum level of barriers, but not their maximum decrease as the barriers' purposes is ensuring quality of production (such tools as licensing, certification, control of production quality, veterinary rules, etc.) and market regulation. On the other hand, the excessive level of barriers influences the final price of production, competition level in the sector, degree of market concentration.

Russia has huge potential in the agrarian business, however there are certain difficulties with its realization. System agrarian policy will allow to solve them.

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