Food security and optimal government intervention level in agriculture (comparative analysis)

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Abstract

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The article analyses the impact of government intervention in the agricultural sector on food security comparatively. The authors conclude that, since 1992, the aggregate volume of agricultural products in these countries has dropped dramatically since the government intervention in agriculture has diminished in most republics of the former Soviet Union. On the other hand, the role of agriculture in the country's economy is decreasing as the GDP per capita increases in the majority of countries. On the contrary, the share of agriculture in GDP is high in countries with relatively small GDP per capita. The authors conclude that the choice of the "optimal place" of the agricultural sector in the economy of the country is important. A method for measuring government intervention in the agricultural sector is proposed. Based on this method, the degree of government intervention in the agricultural sector in some countries is evaluated comparatively. Assessments show that government intervention in the agricultural sector, one of the most liberal sectors of the economy, is widespread in both developed and developing economies. The contact line between the food security index and liberalization of foreign trade, GDP per capita and the level of agricultural development and the level of government intervention in the agricultural sector were estimated by the regression method. The authors came to the conclusion that the level of liberalization of foreign trade and economic growth play a special role in ensuring food security. If the country does not have a competitive advantage in the agricultural sector, there is no need to give strategic priority to this field and to increase government intervention, and liberalization of foreign trade is more appropriate for food security.

Keywords: government intervention; agricultural sector; GDP; food security; food security index; sub-index; foreign trade

Introduction

The economic sector in which the government intervenes in some way is the agricultural sector. However, it seems at first glance that the agricultural sector and subjects involved in this sector are less exposed to government intervention.

It seems that these subjects are more independent in other sectors of the economy, for example, in the industrial and service sectors, and most liberal environmental and market relations have been formed for their activities. They have full control of the factors that are essential for production. However, in almost all countries, the agricultural sector is

exposed to this or that degree of intervention. In all countries, restrictive, regulatory, and supportive interventions are applied to the agricultural sector. The most common form of government intervention in the agricultural sector is a form of incentive (subsidies). In each country, the government uses restrictive interventions that are necessary for the development of agriculture. Restrictions on exports of products of strategic significance or restrictions on imports of any agricultural products may also be referred to as restrictive intervention. The benefits of "yellow basket", "green basket" and "blue basket", regardless of their nature and direction, are the government intervention in the agricultural sector.

The allocation of subsidies by the government to the agricultural sector is particularly dependent on profitability in this field of the economy. Because the average profit margin obtained in this sector, where more time and physical labour and, on the other hand, less knowledge and skills are applied, is significantly lower than industrial and service sector. The necessity to provide food security of the country and the whole development of the regions forced the state to allocate subsidies to the agricultural sector. However, not all countries are equally able to allocate subsidies to the agricultural sector. Some countries view the agricultural sector as a strategic priority of the economy.

At present, the world's largest producer of agricultural products is the European Union (11% of all agricultural products produced in the world) and the US (10% of all agricultural products produced in the world). These countries and other developed countries are the most helpful countries to the agricultural sector. 39% of the total subsidy allocated by the World Trade Organization (WTO) to the agricultural sector belongs to the European Union, 35% to the United States, and 15% to Japan. The share of subsidies given to the agricultural sector in these countries in total agricultural production is 36%, 39% and 37% respectively. In other words, these states intervene in the agricultural sector in the world, interfering with the agricultural sector in their countries, and have a significant impact on the prices of agricultural products. The impact of these countries on the prices by subsidizing agricultural sector will have a significant impact on the Gross National Income (GNI) of other countries, especially the developing countries. Farmers who receive substantial subsidies by the state are more competitive in the world market and gain comparative advantages. Large amounts of subsidies to agriculture by the developed countries, such as the United States, the European Union and Japan, have a significant impact on the prices of strategic products such as wheat, sugar, milk and dairy products in the world market.

Although there are various interventions in the agricultural sector in different countries, it is possible to divide them into two groups: 1) government expenditures on agricultural sector for various purposes; 2) impacts of the model shaping interventions (Muzaffarli & Ahmadov, 2018; Gulaliyev et al., 2018) in the economy, as well as in the agricultural sector. The first is government expenditure to the agricultural sector purposefully, and second is linked to the government intervention to all the fields of economy. For example, prices, minimum wage, licensing, foreign trade regime by government influence on the development of agricultural sector.

Undoubtedly, the government intervention in agricultural sector should be optimized with liberal activity in order to have a positive impact on the overall development of agriculture, in particular in the field of production, market prices, farmers' revenues, as well as on investment volumes. If the government intervention to the agricultural sector is less than the optimal size, it can lead to the weakening of the agricultural field and it can be threat to the country's food security. On the other hand, more intervention than optimal size can lead to the agricultural field's independence and, in some cases, reducing entrepreneurship. Determining the optimal size of government intervention in the agricultural sector can lead to a more accurate definition of the prices of agricultural products in the country and parity between agricultural and industrial sectors and services.

Literature review

The problem of the effectiveness of liberalization processes in the scientific economic literature began to be developed from the beginning of the formation and development of economic theory (Acemoglu & Robinson, 2013). But until now there is not clear understanding on optimal level of liberalization of economy. Even there is not clear attitude to the "government intervention to the economy" category at the economic literature. Afonso and Jallesuse indicators of expenditures on government consumption (their share in total consumption expenditures), transfers and subsidies, tax burden (maximum marginal tax rate) and the number of state-owned enterprises. Along with these indicators, they also take into account the weights in GDP of total public spending, expenditures on government consumption and public debt (Afonso & Jalles, 2011).

The process of liberalization was quite complicated for economies located in the Soviet economic system. In most cases economic liberalization, for example, the expansion of liberal economic activity of household entities, the elimination of obstacles by the state, limiting this activity and expansion of entrepreneurship, as well as the replacement of state pricing processes with free market prices were not accompanied by political and ideological liberalization, and as

a result, faced with serious difficulties (Abalkin, 1993). Recent year's liberalization and economic growth problem in transition countries is actively investigated (The Logic of the Market, 2015). Some researchers believe that this is one of the main reasons for the failure of economic liberalization in most countries (Mau, 1999). However, as in other countries with market economies, the degree of liberalization and the results obtained were different in these countries (Stiglitz, 2003). But many theoretical and empirical results prove that liberalization has positive impact to economic process only under certain conditions (Kotwal et al., 2011; Mrabet & Lanouar, 2012; Khobai & Chitauro, 2018).

In addition to the privatization process, sudden release of prices is also a major factor in accelerating the liberalization process. Even before the collapse of the Soviet Union, some attempts were made for the release of prices. However, for liberal release prices in the Soviet republics were proposed to use the method of "shock therapy" of Gaidar (2010).

The problems of liberalization and state regulation of agriculture have long been studied by foreign researchers. Many economists, including Schultz (1968), Abbott (2002), Alston (1998) and others paid special attention to the issues of state regulation of agriculture. A significant contribution to the study of the problems of state regulation of the economy was made by Abalkin (1997). The problems of state regulation of agriculture in the post-Soviet scientific area were studied in the context of the struggle with the liberal worldview. Questions of state regulation and liberalization of the agricultural sector are reflected in the articles by Lukichev (1999), Krylatykh(2002), Kuchukov (1999), Kuznetsova (2002), etc. However, it should be noted that the majority of the researches do not give a clear answer to the questions: 1) since there is no direct relationship between the levels of liberalization and growth in agriculture, what should be the measure of government intervention for the selected country; 2) whether the level of food security depends on the level of government intervention in the agricultural sector; 3) whether the level of food security depend on the level of liberalization of foreign trade. The second and third questions that need to be investigated require defining "food security" more precisely as well. The concept of "food security" is one of the most controversial concepts in economic literature. Perhaps for this reason over the last decade, more than 200 definitions have been given to the food security (Maxwell & Smith, 1992). However, in most of the definitions given in the concept of "food security", the main issue is individual security, not state security. Food security is the stable situation related to the food, the population can be provided by the food products from physical, social and economic point of view for their health and living (FAO, 2002). This defini-

tion of food security was adopted at the 1996 International Food Summit. This definition is based on the three indicators of the Global Food Security Index (availability, affordability and quality).

The Global Food Security Index requires the study of more than 28 indicators to be quantitative and qualitative. By investigating these indicators, one can evaluate the sensitivity of the state from food security point of view. Various organizations are exploring food security issues from different angles. The GFSI methodology differs from the methodology of other organizations. The main difference is that the GFSI takes into account quantitative and qualitative changes of the three main indicators mentioned above. On the other hand, this index takes into account changes in food prices and food-related risks in the country.

Thus, state aid to the agricultural sector is necessary and beneficial for each country. However, it is the main factor that creates serious problems in the global scale. As a result, two scientific views contradicting each other in the state support (intervention) to the agricultural sector have been formed. First, the agricultural sector needs more state support, and the second, on the contrary, is the development of agricultural sector in a liberal competition environment (liberal and neoliberal view). Granting subsidies by the developed countries according to the liberal and neo-liberal view eliminates the comparative advantage of the agricultural sector in countries that do not give such subsidies. Similarly, such cases affect the position of farmers who receive and do not receive subsidies on the world market. According to the neoliberal view, agricultural households, which have high productivity in any country, have gained comparable advantage over the world market and gain profits both for their country and for themselves. Such liberal competition all over the world can eventually lead to a decline in prices both on the market and on distribution of revenue in the global scale.

Another view points out the importance of state support for the agricultural sector by criticizing neo-liberalism on the basis of the significance of agricultural sector for food security, the social welfare of the workers in this sector, the development of the regions and so on. Undoubtedly, the state support to the agricultural sector cannot be stopped completely. Because there are issues affecting the development in the agricultural sector so that the farmers or their associations separately cannot cope with this problem. Government intervention in the solution of such problems is important. On the other hand, the "excessive" government support to the agricultural sector can have a negative impact on farmers' entrepreneurialism and may cause to "excessive" price deflation. In this case, the profitability of workers in the agricultural sector can be seriously diminished. This may cause

other problems, such as a sharp decline of sown areas or a sharp reduction in the number of animals in cattle-breeding, as well as leaving of the population the regions and so on.

Thus, the state support for the agricultural sector should be optimized, taking into account several parameters: 1) increase in agriculture; 2) ensure that the country has at least a minimum level of assurance for products of strategic importance; 3) the welfare of the population in the agricultural sector is not less than the average well-being in the country; 4) the average price of agricultural products in the country in accordance with consumer basket; 5) productivity in the agricultural sector is not less than average productivity in the world. On the other hand, state support to the agricultural sector should increase productivity in industrial-technological (use of material resources), production-economic (food production), socio-economic and ecological-economic areas. Determining the economic efficiency of government support for the agricultural sector in any country and defining the "optimal limit" of government support should be accomplished by using comparative analysis with other countries. Comparative analysis also allows countries to determine comparative advantages with other countries.

Methods

To determine the optimal degree of government intervention in the agricultural sector, we will take the relation between the level of government intervention in the agricultural sector and the level of food security. The evaluation will be based on the "cross-section series" and the "time series". We will take "time series" assessment for Azerbaijan case. It should be noted that the only criterion for determining the optimal degree of government intervention in the agricultural sector is the food security is only valid for the first approach. Assurance of food security is one of the main targets of government intervention in the agricultural sector. One of the other targets is the sustainable development of the regions or the employment of the population in rural areas and so on.

In order to determine the level of intervention of the government in the agricultural sector, we will use two indicators comparatively. The first indicator is defined as the agricultural share of government expenditures in total expenditures divided by the agricultural share of value added in GDP. This indicator is known as the Agricultural Orientation Index (AOI) (Food and Agriculture Organization, 2019). Agricultural Orientation Index is used to measure 2.a targets of Sustainable Development Goals. If the Agricultural Orientation Index is greater than 1, it means that the government gives the agricultural sector more advantages. Investment in the agricultural sector is higher than the share of this sector in GDP. The fact that the Agriculture Orientation Index is lower than 1, it means that the government investment in the agricultural sector is less than the contribution of this sector to GDP. AOI = 1 means that agricultural sector investment is equivalent to the contribution of this sector to GDP, the government expenditures to agricultural sector are at a neutral level.

As the second indicator, we will use the share of government expenditures on agricultural sector in total government expenditures (agriculture index-AI). The main difference of this indicator from the Agriculture Orientation Index is that this indicator changing [0; 1] range, allows comparative study of the level of government intervention in the agricultural sector. Thus, depending on the amount of the expenditures of the agricultural sector, countries are "left-to-right" on a scale (from the level of more intervention to the level of less intervention, or vice versa). It is quite clear that AI has been located in neither "1" nor "0" in any country. All countries are located in the range [0; 1].

AOI's important difference from the AI is that AI is related to the economic, including agricultural policy of the country. It can be managed by decision makers based on the analysis of the relations between different economic indicators, in particular the amount of added value in the agricultural field, the poverty and unemployment levels in rural areas, and the linkage to the Global Food Security Index. The Agricultural Index also has the potential to be a subject of political struggle. Due to its impact on the dynamics of its change and the agricultural sector's development, the left-wing political parties may demand the increase of government intervention in the agricultural sector, and the right-wing political parties may seek to reduce such intervention.

It should be noted that the AI is a very simple index characterizing the intervention of the government in the agricultural sector and does not cover all interventions and in the broadest sense, it cannot be a formula for the government agricultural intervention level. Because if we assume that there is a certain relationship between government expenditure and the development of the agricultural sector, depending on the direction of this relationship, it is difficult to assess the effectiveness of the intervention. Nevertheless, in the first approach, we can compare the impact of government intervention in agricultural fields on food security comparatively in different countries through the relation between the Agriculture Orientation Index, as well as the Agriculture Index and the Global Food Security Index. It should be noted that the figures included as "government expenditures on agricultural fields" are also the sum of direct and indirect costs for fishing and forestry. These costs in some countries come

both from the state budget and from other government sources. Thus, the calculations are approximate.

The analysis of dependence of food security on agricultural production, level of foreign trade liberalization and dependence on GDP volume in the country suggests that liberalization of foreign trade and ensuring economic development is sufficient in order to ensure food security within any country. There is no need to stop the agricultural sector on the basis of such economic development. This may be a field of service that does not have material benefits. For comparison, nowadays, the share of value added generated in the service sector in developed countries is growing steadily. Unfortunately, in the 21st century, where globalization has expanded, many economists and politicians have insisted that food security should be selected as the strategic advantage of agricultural development. Even in some countries, a rigid customs regime is applied for agricultural products. On the contrary, some countries choose a service sector as a strategic priority and are not worried about the increase in imports of agricultural products.

In some countries, the importance of increasing GDP and national income for food security is a superior concept. This indicator, in one way or another, demonstrates the affordability of the population to access food. Naturally, the GDP per capita increases with the ability to access food. In addition, the tendency to choose the field of service as a strategic priority of the economy and the import of agricultural products is expanding. For providing the necessary products for food security in such countries is less expensive than investing in agriculture. For this reason, there is a need to find a relation between food security and the liberalization of foreign trade. To measure the level of foreign trade liberalization, we use the sub-index of foreign trade (Gulaliyev et al., 2017).

Results

Considering the share of government expenditures on agricultural sector (AI) in total government expenditures on the government agricultural sector, we listed 65 countries in the top 1 in the list. If we listed 65 countries in the increasing order of this indicator, the row in Table 1 will be obtained. As can be seen from the table, developed countries and developing countries do not create groups in this ranking. Therefore, in these countries, the intervention of the government in the agricultural sector can be analysed comparatively without regard to the level of development. If we perform this sequence above the horizontal line from more intervention to less intervention, then the countries are listed from "left" to

Table 1. Agricultural Index (AI) per capita in some countries -2015

	Countries	AIPE	AI		Countries	AIPE	AI		Countries	AIPE	AI
1	Belgium	0.257	0.0015	23	Ireland	0.352	0.0108	45	Timor-Leste	0.174	0.0257
2	El Salvador	0.016	0.0017	24	Bahamas	0.425	0.0111	46	Iceland	0.866	0.0271
3	Singapore	0.430	0.0027	25	Russia	0.301	0.0121	47	Armenia	0.161	0.0278
4	United Kingdom	0.474	0.0032	26	Hungary	0.515	0.0129	48	Lithuania	0.604	0.0295
5	Netherlands	0.248	0.0034	27	Estonia	0.580	0.0132	49	Czech	1.827	0.0303
6	Denmark	0.252	0.0037	28	South Africa	0.593	0.0136	50	Turkey	0.353	0.0330
7	Sweden	0.344	0.0042	29	Slovenia	0.371	0.0137	51	Vanuatu	0.080	0.0339
8	Israel	0.710	0.0045	30	Malta	1.699	0.0141	52	Azerbaijan	0.185	0.0418
9	Greece	0.089	0.0046	31	Costa Rica	0.208	0.0145	53	Switzerland	1.896	0.0423
10	France	0.364	0.0050	32	Brazil	0.247	0.0148	54	Botswana	0.307	0.0490
11	Italy	0.364	0.0058	33	Norway	1.248	0.0156	55	Bulgaria	1.511	0.0510
12	Germany	0.822	0.0066	34	Mongolia	0.096	0.0157	56	Japan	2.437	0.0514
13	Austria	0.303	0.0078	35	Egypt.	0.153	0.0165	57	Moldova	0.373	0.0542
14	Portugal	0.206	0.0080	36	Cyprus	0.800	0.0170	58	Kazakhstan	0.454	0.0551
15	Ukraine	0.108	0.0082	37	Chile	0.323	0.0176	59	Myanmar	0.170	0.0572
16	Latvia	0.190	0.0082	38	Spain	0.985	0.0185	60	Sri Lanka	0.511	0.0737
17	United Arab Emirates	5.235	0.0083	39	Kyrgyz	0.112	0.0189	61	Uzbekistan	0.577	0.0793
18	Australia	0.519	0.0084	40	Finland	0.838	0.0189	62	Belarus	1.323	0.0804
19	Luxembourg	1.563	0.0090	41	Romania	0.166	0.0215	63	Togo	0.388	0.1169
20	Slovak Republic	0.552	0.0093	42	Albania	0.122	0.0237	64	China	1.181	0.1536
21	Angola	0.030	0.0106	43	Paraguay	0.191	0.0249	65	Bhutan	0.441	0.1662
22	Poland	0.177	0.0107	44	Mauritius	0.615	0.0255				

Note: calculated by authors

the "right". Such an order suggests that countries with high levels of intervention are more dirigiste, countries with low levels of intervention are more liberal in relation to the agricultural sector.

According to the Table 1, we can say that Bhutan, China, Togo are the most dirigiste countries on the government intervention to the agricultural sector. At the same time, Belgium, El Salvador, Singapore, United Kingdom is the most liberal countries. It is notable that the majority of 65 countries attracted to the analysis, agricultural index are lower than 0.02, countries located more on the right side of the geometric mean of the scale. This means that the agricultural sector is one of the areas in which the government has less intervened. By 1991, agriculture in the former Soviet Union countries was almost entirely under government control. Liberalization is expanded in the agricultural sphere, as well as in other spheres after the collapse of the Soviet Union in the countries that gained independence. Liberalization covered a variety of issues ranging from privatization of state-owned and agricultural enterprises to decreasing government spending on the agricultural sector. As a result, the agricultural index began to differ dramatically in Russia, Belarus, Kazakhstan, Azerbaijan, Armenia, Uzbekistan, Lithuania, Latvia, Kyrgyzstan, Ukraine and other countries where the government intervention during Soviet times was at the same level. From Table 1, Ukraine, Latvia and Russia are less likely to intervene in the agricultural sector among these countries.

We can also characterize the government intervention in the agricultural sector, with the similar indicator, along with the Agricultural Index we mentioned. We can characterize this indicator as a ratio of public expenditure per employee to public expenditure (AIPE) in the agricultural sector per capita. The difference between this indicator and AI is that the agricultural sector in the AI reflects the volume of the agricultural sector and it distorts the view in the inter-country comparison. We eliminate the impact of size of agricultural sector on the calculation of costs per employee. Indeed, the

order of countries on these two indicators is not only overlapping, but in some cases standing on opposite poles. For example, Belgium, the United Kingdom, Netherlands considering liberal which is a "right" pole changed to the "left", Bhutan, Togo considering dirigiste which is a "left" pole has changed to the "right". However, the AIPE indicator also does not distinguish developed countries from developing countries noticeably. Some developed countries are more "right" and some more "left" for this indicator (Figure 1 and Figure 2).

According to the analysis of the relationship between the AI and AIPE indicators with the value added in the agricultural sector, we cannot claim that both the relative volume of government expenditure on the agricultural sector (AI) and the volume per employee (AIPE) have always positively impacted the added value generated in the agricultural sector (Figure 2 and Figure 3). In other words, raising government expenditure on the agricultural sector does not guarantee the increase in product volumes. There are countries where, for example, the share of agricultural sector in government expenditure in Belgium is 0.15%, the agricultural value added per employee in the agricultural sector exceeds 48,000 US dollars. However, the agricultural value added per employee is 2,000 US dollars in El Salvador, which is in the "right" order. In addition, in countries with a high level of government expenditure on the agricultural sector, the agricultural value added per capita is lower than the average world indicator. For example, in Japan, Bulgaria and Moldova about 5% of government expenditure is directed to agricultural sector. But in these countries, agricultural value added per agricultural worker differs greatly from one another. In Japan, this figure is about 18,000 US dollars and Bulgaria is more than 8,000 US dollars while in Moldova it is only 1,500 US dollars (Figure 4).

The relation between the share of government expenditure in the agricultural sector (AI) and agricultural value added in the agricultural field or the calculation of the relation between value added per employee in the agricultural
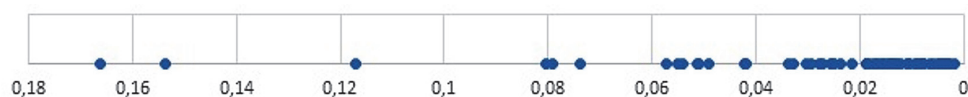

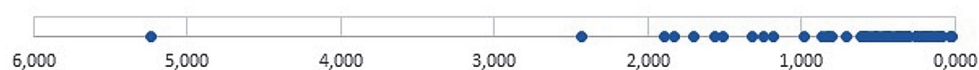**Fig. 1. Left-to-right order of 65 countries on agricultural index. AI (average) = 0.027379**
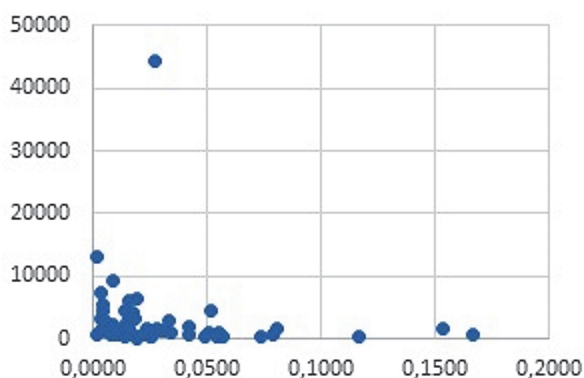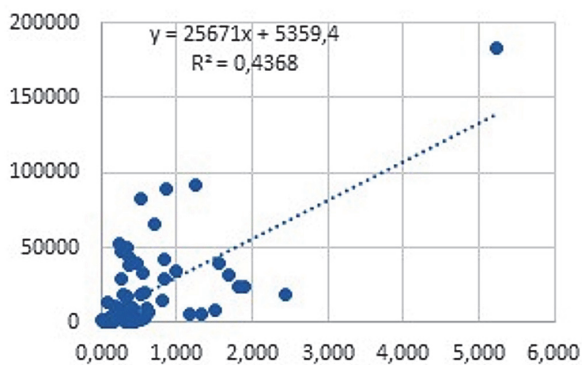

Fig. 2. Left-to-right order of 65 countries on government expenditure for per employee in the agricultural sector. AIPE (average) = 0.615543
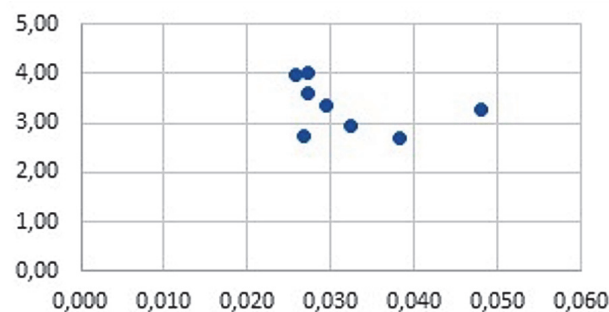
Fig. 3. Relation between the share of government expenditure in the agricultural sector (AI) for 65 countries and the agricultural value added per capita in rural areas
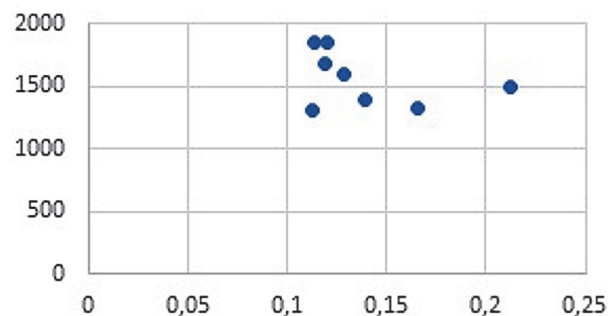

Fig. 4. Relation between the values added per employee in agricultural sector for 65 countries and government expenditure (AIPE) in the agricultural sector


Fig. 5. Relation between the shares of government expenditure in the agricultural sector (AI) and the agricultural value added (billion USD) in the agricultural field on Azerbaijan

Fig. 6. Relation between values added per employee in the agricultural sector (AVA) and the share of government expenditure per employee in the agricultural sector in government expenditure per capita (AIPE)

sector (AVA) and the share of government expenditure per employee in the agricultural sector in government expenditure per capita (AIPE) give approximately similar results (Figure 5 and Figure 6). Thus, both of these relations prove that government expenditure on the agricultural sector in Azerbaijan has not led to significant growth in the agricultural sector. Thus, an increase in the intervention reduced the value added. Moreover, it would be more effective to reduce the intervention. This conclusion once more proves that government intervention in the agricultural sector in Azerbaijan is beyond its optimal level.

Undoubtedly, directing government expenditure on rural areas or direct agricultural sector can have a positive impact on the lives and activities of people living in these regions and can stimulate production volumes. However, the calculations show that although government expenditure in the development of the agricultural sector has a certain role, it

is not crucial. Nevertheless, it does not mean that the government intervention in the agricultural sector is not necessary. The main problem is not the government intervention in the economy, including the agricultural sector. The main problem is how close the intervention is to the optimal limit. If the amount of intervention is close to the optimal limit, then it can be assured of its effectiveness. Otherwise, such interventions will have an adverse effect. Therefore, it is necessary to find the optimal extent of the government intervention in the economy, including the agricultural sector. The optimal limit varies depending on the country, the economic conjuncture and the time.

It is important to take a few criteria in determining the optimal extent of government intervention in the agricultural sector. The first one is the volume of the value added generated in the agricultural sector. Another crucial criterion is to raise the salaries of employed people in the agricultural sector to the level of average wages in the country, and to eliminate income inequality between urban population and
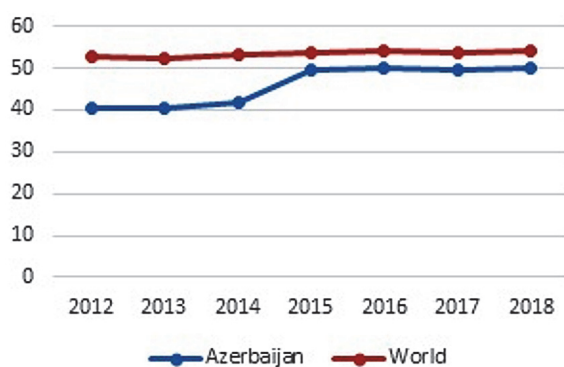
Fig. 7. Comparison of Azerbaijan's GFSI with the world

rural population. Assurance of food security can also be one of the key indicators for determining the optimal limit.

The impacts of the government intervention in the agricultural sector on food security also require reconsideration of the strategic importance of food security for the agricultural sector. Thus, on a global scale, the agricultural sector is the only means of ensuring food security, because it does not have the ability to exchange food from other planets. However, the agricultural sector as a strategic priority within the country does not justify itself in the context of increasingly globalization. Thus, each country cannot have comparative advantages for the more efficient development of the agricultural sector. On the other hand, the decline in the share of value added in the agricultural sector in the developed countries in the volume of total value added gives rise to the fact that, besides the agricultural sector, the importance of economic liberalization is increasing in the provision of food security.

Compared to 2012, Azerbaijan's GFS Index has significantly increased in 2018. Compared to Turkey, Russia and Ukraine, the low level of food security in Azerbaijan is one of the reasons for migration to these countries (see Figure 7 and Figure 8).
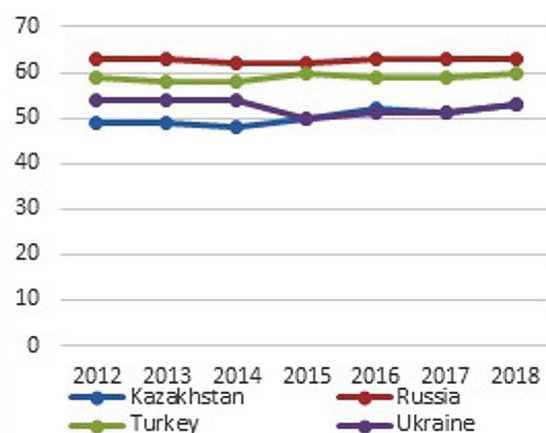
Fig. 8. GFSI on some regional countries

Particularly disturbing fact is that Azerbaijan's food security is lower than the average on 113 countries. Another disturbing factor is that Azerbaijan is at a low level on the third sub-indicator of food security – *"food quality and safety"*. The low purchasing power of the population has a significant impact on the quality of imported food products in the country. According to this indicator, Azerbaijan is far behind the average world level

The dependence of Global Food Security Index (GFS Index) for 42 different countries according to the level of economic development on the agricultural index (AI), the share of government expenditure per employee on agricultural sector in government expenditure per capita (AIPE), liberalization of foreign trade, the GDP per capita and the volume of value added generated in agriculture (Table 2) suggests that the GFS Index depends only on two of these factors: on the GDP per capita and on the liberalization of foreign trade, and the regression statistics of this relation are the same as in Table 2.

The P-value does not exceed the required interval for three of these indicators for the dependence on the agricul-

Table 2. Regression statistics of some indicators with GFS Index

	Coefficient	Standard errors	t-statistics	P-value
GFS Index	76.72203	5.000976	15.34141	3.15102E-14
AI	-0.81964	0.973006	-0.84238	0.407563771
AIPE	-34.0253	35.63909	-0.95472	0.348860747
Freedom of Foreign trade	-40.5954	16.52237	-2.457	0.02129641
GDP p.c	0.000314	4.84E-05	6.478648	8.73916E-07
Agriculture value added p.c.	1.61E-07	2.94E-07	0.549857	0.587296937
P-value = 4.52E-08				
Multiple R = 0.895643				
R-quadrate = 0.802177				

Note: calculated by authors

tural index (AI), the share of government expenditure per employee on agricultural sector in government expenditure per capita (AIPE) and the volume of agricultural value added per capita. In other words, the food security for the selected country depends largely on GDP per capita and the liberalization of foreign trade.

Conclusion

Taking into account the exceptional role of the agrarian sector in the overall food security, each country pays special attention to its funding. But public spending on this sector does not give the expected results in most countries. But this does not mean that state intervention in the agrarian sector is not necessary. The empirical researches show that the value added in the agrarian sector cannot always be positive relationship with the state intervention level in this sector. As well as this conclusion relates to the relationship between food security and state intervention in the agrarian sector. In some countries, the state intervention in the agrarian sector has positive or negative impacts. This connected with the fact that how much the intervention level is close to the optimal interval. Moreover, the lack of correlation between the food security of any country and the state's agrarian sector intervention, as well as the value added in the agrarian sector proves that agrarian sector cannot be a strategic priority sector for each country. Development of globalization, as well as liberalization of foreign trade facilitates inter-country relations, each country should choose a strategic priority area based on its comparative advantages.

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