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## INFLUENCE EFFECTS ASSESSMENT OF INTERSTATE INTEGRATION ON KAZAKHSTAN AGRICULTURAL SECTOR

*Researching the agro-industrial complex development in formation of the Eurasian economic Union context is intended to assess the impact on agricultural production stability and competitiveness and its growth in integration process.*

*Using the following indicators to assess the international economic integration process was carried out effects assessment of interstate integration on stability and competitiveness Kazakhstan's agricultural sector: the economic openness indicator, the share of mutual trade turnover in the total trade turnover, the index of intra-industry trade for two countries case and one industry (the Grubel-Lloyd index), the preference coefficient, the mutual preference coefficient, the relative preference coefficient.*

*Countries that are members to the integration Union get a number of dynamic advantages, which are showed in integration development process in the long term. There are not excluded the probability of the following negative integration effects – unilateral advantages for more developed member countries, price increases due to the formation of member countries' transnational companies, demonstrations of descending economies effects scale (losses on scale).*

*In general, the positive effects of integration, both static and dynamic, exceed the negative ones.*

***Keywords:*** *agricultural sector, integration, Eurasian Economic Union, effects of interstate integration, agro-industrial complex, national agrarian economy, export, import, sustainability, competitiveness.*

***Кілт сөздер:*** *аграрлық сектор, интеграция, Еуразиялық экономикалық одақ, мемлекетаралық интеграцияның әсері, агроөнеркәсіптік кешен, ұлттық аграрлық экономика, экспорт, импорт, тұрақтылық, бәсекеге қабілеттілік.*

***Ключевые слова:*** *аграрный сектор, интеграция, Евразийский экономический союз, эффекты межгосударственной интеграции, агропромышленный комплекс, национальная аграрная экономика, экспорт, импорт, устойчивость, конкурентоспособность.*

**JEL classification: Q17**

**Introduction.** Balanced and competitive development of agricultural sectors determines the target organization of mutually beneficial cooperation in the countries integration interaction. Because it is not only a production sphere, but also a complex multifunctional system that performs the following wide range of national economic functions: non-agricultural activities various types, demographic, environmental, environmental protection, etc.

Considering the multifaceted demonstration of integration processes its effectiveness assessment issues are important not only from the theoretical research viewpoint, but also to identify opportunities for further participation in a regional integration association. However, it is difficult to assess the integration processes effectiveness for the following reasons [1]:

- integration effects appear over time, therefore, at a certain moment, the assessment is always conditional;

- it is almost impossible to take account all

the gains and losses from integration, as well as assess all the costs of integration activities;

- it is rather difficult to identify, formalize and quantify many integration effects;

- integration effects appear in a certain hierarchy (primary, secondary, etc.), at that higher order group effects is not directly related to the integration;

- there are different directions of integration effects at the macro and micro levels (for example, trade liberalization may be beneficial to the state and unprofitable to national producers);

- the integration effects arise and show at different stages of the integration process development and possible their double counting.

**Literature review.** Nevertheless, several ways of measuring the integration processes effects have been suggested. The scientific and methodological apparatus formation is related with American economists' works J. Viner [2] and J. Meade [3], who formulated the classical position on the trade effects expansion and trade flows redirection and the customs unions theory.

Attempts to quantify assessment impacts various forms of states economic integration have been made in the works W.E. Prewo [4], B. Balassa [5], D.G. Mayes [6]. They proved the non-acceptance obviousness of economic decisions without serious and, above all, quantify assessment impacts of creating one or another states integrative association.

The measurement method, for example, B. Balassa's was based on determining the demand elasticity for imports by income (GNP), an increase the indicator which was considered as a trade creation effect. Before the integration group formation comparing of the EU countries demand elasticity for imports, with the same indicator after formation the EU, according to 7 industries showed a significant trade creation effect. Before the EU formation growth of 1 % in GNP brought to increase in trade between countries by 2.4 %, after the EU formation – by 2.7 %, that is, the total increase in trade was

12.5 %. In some industries, it was 20-50 %. The demand elasticity for imports from non-EU countries has not changed much [5].

In economic science of the post-Soviet space are also actively developed the modern theoretical problems of regional economic integration and customs unions. For example, integration processes are considered in economic growth context of States that are integrative associations' members. At the same time, the growth parameters quantify assessment is implemented using econometric methods by processing the available statistical information and extrapolating the identified trends [7].

According to some researchers, the integration effects assessment is also difficult due to the nonlinearity process, which shows in the multi-variance development, which is caused by [8]:

- firstly, it has two levels in integration process development (transformation of the States production systems and supranational governance bodies' development);

- secondly, multidirectional interests of separate countries, firms, structures;

- thirdly, different degrees of separate components adaptability, in the reproductive structures form;

- fourthly, different levels development of separate territories;

- fifthly, the States national interests related to socio-cultural conditions.

The complex systems development such as interstate associations can be accompanied by sharp transformations. These processes nonlinear dynamics mean that their rational forecasting, centralized management and control possibilities are limited.

During international integration development the integration activities can either increase (for example, the European Union), or have a negative interaction level (for example, the CIS). At the same time, the any state role may change (as a part of the whole integration system). As a result, there are changes in economic dynamics development.

The impact's nonlinearity of integration processes is obvious concerning Kazakhstan agro-industrial complex, as marked different directions as the industries development, as well as their interaction with the EAEU countries. For example, increase rates of production in sensitive industries have a significant scatter (from +66 % non-condensed milk and cream to –4 % condensed milk products in 2015-2019). At the same time there is an increase in demand of participating countries for products in Kazakhstan market (from 1.9 times for condensed milk products to 3.6 times for chees). The increase in demand for domestic goods also has a different trend in Eurasian market (from +200 % for sausage products to –10 % for chees).

These trends within the mutual trade framework have become stable sustainable and can serve as a basis for the directions development to optimize the interaction of sensitive agricultural industries with the EAEU countries.

Arguing these assumptions, some experts note that the change in production's scale is a direct result of the integration. And it is the result of the so-called static and dynamic factors that allow economic entities to widely use the opportunities of a larger market.

Researching the agro-industrial complex development in formation of the EAEU context is intended to assess the impact on agricultural production stability and competitiveness and its growth in integration process. This analysis main purpose is to identify objective opportunities for the most rational participation in international labor division, to determine the competitive production's optimal structure.

**Main part of the research.** The indicators, allowing assess the international economic integration process include development level of foreign trade with the integration union member countries, mutual foreign investments volume, the member countries share in exports (imports) total volume of integration union's separate states, the share of exports, imports, and the country's trade turnover to the gross product. These indicators are easy to calculate and the results can be easily analyzed.

To assess the mutual trade dynamics are widely used the following two indicators [9].

The first indicator is an economic openness and it presents the ratio of the mutual trade volume (trade with an integration association's members) in goods to GDP:

$$PO = (\text{Эint} + \text{Иint}) / GDP, \quad (1)$$

where Эint – the export cost to integration association's countries;

Иint – the import cost from integration association's countries;

GDP – the gross production cost of agro-industrial sector (in this case, it is the agriculture and processing industry gross product).

The second indicator is mutual trade in goods importance, which is the share of mutual trade turnover in the total trade turnover:

$$TI = (\text{Эint} + \text{Иint}) / (\text{Эall} + \text{Иall}), \quad (2)$$

where Эall – the export total cost from country;

Иall – the import total cost to the country.

For example, for conditions' 2019, the share of agro-industrial products turnover with the Eurasian Economic Union countries is related for 33 % of the total foreign trade turnover for these products (the calculation also includes the new member countries Kyrgyzstan and Armenia).

At the same time, this indicator is 16.3 % for agricultural raw materials and products, and it is 44.4 % for industrial output products. It should be noted that a negative balance creates trade in industrial products both in interaction with EAEU countries and with third world countries.

To highlight the integration effects given impact of the business cycle and other factors it is made of intra-industry trade assessment, i.e., export/import trade flows availability within branches between countries [10]. The formula for calculating the intra-industry trade index in the case of two countries and one branch is

conducted by Grubel-Lloyd index (GL):

$$L = 1 - [|Эin - Иin|/(Эin + Иin)], \quad (3)$$

where Эin – the branch products' export to integration association's countries;

Иin – similar products' import from integration association's countries.

The index takes the value 1 in case if export equals import, i.e. ideal intra-industry trade, and the value 0 – in case, there is only export or only import. Closer the index value to 1, more the branch trade flows' intersection, which means an increase intra-branch trade quality. The formula generalized as a branch groups, and country groups.

As seen, there are tools for assessing integration processes from different sides, however, modern economic science is not yet able to determine their implementation full effect, which is caused by the multiplicity of consequences in time and space. Nevertheless, in the economic literature identifies several indicators that serve as instruments for measuring the international economic integration impact [11; 12]:

- preference coefficient that allows to determine the trade links, in which countries have a high degree of attraction. The coefficient takes values from zero to one. If the value is zero, then there are no trade relations between the states, if it is one, they are at the world average. The greater the coefficient value, the greater the countries trade integration. The preference coefficient is calculated by the formula:

$$K_1 = T_i/T_w \quad (4)$$

where $T_i$ – the share trading in trade with any state;

$T_w$ - the partner country specific gravity in international foreign trade;

- mutual preference coefficient, which is determined as the average indicators value of preference by the first partner for the second and vice versa. This coefficient allows determining trade integration for two countries at the same time. The coefficient is calculated by the formula:

$$K_2 = (average \ K_1^{ij}, K_1^{ji}), \quad (5)$$

where: K1ij – the i-th country preference coefficient for country j,

K1ji – preference coefficient by the j-th country for country i;

- relative preference coefficient, which value must be higher than one. It shows how much higher the international trade relations intensity between two countries is compared to their relations with other states.

Change in the national agricultural economic openness indicator was calculated using the formula (1) (table 1).

Table 1

**Openness of Kazakhstan's agricultural market in the EAEU, USD million***

| Indicator | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|
| Export (Эint) | 1 000,4 | 1 057,4 | 1 241,5 | 1 366,2 | 1 344,6 |
| Import (Иint) | 2 957,8 | 2 676,5 | 3 012,9 | 3 094,6 | 3 335,8 |
| Gross production, total (GDP) | 17875,7 | 10526,8 | 12151,9 | 13355,5 | 13208,1 |
| The openness indicator (PO) | 0,221 | 0,354 | 0,350 | 0,334 | 0,354 |

*\*Calculated by the authors based on sources [13], [14]*

Using formula (3) calculated the Grubel-Lloyd index indicators for sensitive agro-industrial sectors of Kazakhstan in cooperation with the EAEU countries (table 2).

Table 2

**The Grubel-Lloyd index indicators for sensitive agro-industrial sectors
of Kazakhstan in cooperation with the EAEU countries***

| Branch | 2015 | | | 2019 | | |
|---|---|---|---|---|---|---|
| | export, tonnes | import, tonnes | GL index | export, tonnes | import, tonnes | GL index |
| Non-condensed milk and cream | 7 568,3 | 46 260,7 | 0,282 | 38 853,6 | 21 853,2 | 0,720 |
| Condensed milk and cream | 523,4 | 41 150,8 | 0,026 | 912,4 | 38 789,7 | 0,046 |
| Chees | 1 750,1 | 21 202,7 | 0,153 | 3 419,4 | 25 434,9 | 0,238 |
| Sausage goods | 451,0 | 32 737,5 | 0,028 | 407,6 | 33 313,7 | 0,025 |
| Sunflower oil | 29 363,6 | 130 340,6 | 0,368 | 105 986,8 | 117 148,9 | 0,950 |
| White sugar | 683,7 | 411 472,5 | 0,004 | 8 158,1 | 390 188,0 | 0,041 |

*\*calculated by the authors based on source [15]*

The coefficients calculated using formulas (4) and (5) for assessing the Kazakhstan and Russia trade integration shows a high level interaction (table 3).

Table 3

**Preference coefficients in Kazakhstan
and Russia integration***

| Coefficients | Indicators |
|---|---|
| Preferences: | |
| - Kazakhstan-Russia | 9,2 |
| - Russia-Kazakhstan | 9,5 |
| Mutual preference | 9,3 |
| Relative preference | 99 |

*\*Compiled on data [7]*

Table 1 shows that after the creation of the Customs Union, there was a decrease in market openness and decrease mutual trade growth.

However, a similar openness indicator, but calculated for trade with third world countries, shows an increased the republic's economy openness.

Calculation Grubel-Lloyd index for the EAEU (table 2) shows that despite the increase in the cost indicators of member states' mutual trade in 2015-2019 the intra-industry trade index decreased. It evidences about the trade flows alignment on separate trading positions.

The intra-industry trade and, accordingly, the Grubel-Lloyd index increase occurred only for non-condensed milk and cream products and sausage goods. For trade in these products, there is a significant increase in both exports and imports. The assessment showed a strong decrease in intra-industry trade in white sugar and sunflower oil. This is caused by a change in the ratio between exports and imports, in favor of the latter.

Table 3 shows that all coefficients have large indicators, which are significantly higher than the world average, which demonstrates a high integration degree between countries. It should be noted that these indicators can fluc-

tuate by periods, and the integration process activation has high efficiency.

The listed tools for measuring international integration show the relations intensity between countries at some point in the integration processes development. But they do not determine the actual integration degree – its development level.

Therefore, the result of creating new good flows within the integration framework performs an increase in production and, consequently, the welfare in the countries participating in the grouping, the specialization level. All this together allows extensive use of these advantages to increase production efficiency.

**Conclusion.** In general, at the moment the theoretical foundations for the creation and functioning of states economic associations have received significant development.

Countries that are members to the integration Union get a number of dynamic advantages, which are showed in integration development process in the long term. There are not excluded the probability of the following negative integration effects – unilateral advantages for more developed member countries, price increases due to the formation of member countries' transnational companies, demonstrations of descending economies effects scale (losses on scale). However, in general, the positive effects of integration, both static and dynamic, exceed the negative ones.

Depending on arise sphere and influence object are highlighted the following international integration effects [1]:

1 The trade effect is related with an integrated market formation, which supposes the implementation of a coordinated state policy in mutual and foreign trade fields, and which is expressed in a decrease in trade costs, redistributing trade flows, changing the volumes and structures of mutual and foreign trade.

2 Production effect causes a deepening labor division, provides structural changes in the production sector (industries, geographical), initiates technological changes, increases competitiveness and productivity.

3 The price effect consists in the price level changing and pricing mechanisms transforming, which is related to the common market interstate coordination and its regulation mechanisms.

4 The consumption effect is expressed in volumes and structures consumption's changing, getting consumers access to a wider products range and reorienting their preferences to producers with a lower price.

5 The competition effect is related with a new competitive environment formation that extends to a wider market space with a large number of market participants, changes in state competition policy, and transformation of barriers to entry into the market.

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**ҚАЗАҚСТАННЫҢ АГРАРЛЫҚ СЕКТОРЫНА МЕМЛЕКЕТАРАЛЫҚ ИНТЕГРАЦИЯ ӘСЕРІНІҢ НӘТИЖЕСІН БАҒАЛАУ**

**Аңдатпа**

Еуразиялық экономикалық одақтың қалыптасу жағдайындағы агроөнеркәсіптік кешеннің дамуын зерттей отырып, интеграциялық процесі өсуінің ауылшаруашылық өндірісі тұрақтылығы мен бәсекеге қабілеттілігіне әсерін бағалау ұсынылады.

Халықаралық экономикалық интеграция процесін бағалауға мүмкіндік беруші көрсеткіштер қарастырылды: экономика ашықтығының көрсеткіші, жалпы сауда айналымындағы өзара сауда айналымының үлесі, екі ел мен бір сала жағдайлары үшін (Грубель-Ллойд индексі) ішкі салалық сауда индексі, артықшылық коэффициенті, өзара артықшылық коэффициенті, салыстырмалы артықшылық коэффициентін қолдану арқылы Қазақстан аграрлық саласының орнықтылығы мен бәсекеге қабілеттілігіне мемлекетаралық интеграцияның әсерін бағалау жүргізілді.

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Интеграциялық одақ елдері интеграцияның ұзақ мерзімді даму үдерісінде көрінетін бірқатар динамикалық артықшылықтарды иеленеді, сонымен бірге интеграцияның теріс әсерлерінің пайда болу ықтималдығы ескертіледі – неғұрлым дамыған мүше елдер үшін біржақты артықшылықтар, мүше елдердің трансұлттық компанияларының қалыптасуына байланысты бағаның өсуі, төмендетілген ауқым нәтижесінің (ауқымдағы шығындардың) пайда болуы.

Жалпы алғанда, интеграцияның әрі статикалық, әрі динамикалық жағынан қарастыратын болсақ, теріс әсерлерге қарағанда оң әсері басым болып келеді.

**А.А. Пягай, С.С. Шинтаева**

## ОЦЕНКА ЭФФЕКТОВ ВЛИЯНИЯ МЕЖГОСУДАРСТВЕННОЙ ИНТЕГРАЦИИ НА АГРАРНЫЙ СЕКТОР КАЗАХСТАНА

### Аннотация

Исследуя развитие агропромышленного комплекса в условиях формирования Евразийского экономического союза, предполагается оценить влияние на устойчивость и конкурентоспособность аграрного производства нарастание интеграционного процесса.

С помощью показателей, позволяющих оценить процесс международной экономической интеграции: показатель открытости экономики, доля оборота взаимной торговли в общем обороте торговли, индекс внутриотраслевой торговли для случая двух стран и одной отрасли (индекс Грубеля-Ллойда), коэффициент предпочтения, коэффициент взаимного предпочтения, коэффициент относительного предпочтения, проведена оценка эффектов межгосударственной интеграции на устойчивость и конкурентоспособность аграрного сектора Казахстана.

Страны, входящие в интеграционный союз, получают ряд динамических преимуществ, которые проявляются в процессе развития интеграции в долгосрочном периоде, где не исключается вероятность возникновения негативных эффектов интеграции - односторонних преимуществ для более развитых стран-участниц, повышение цен вследствие формирования транснациональных компаний стран-участниц, проявлений нисходящего эффекта масштаба (потерь на масштабе).

В целом позитивные эффекты интеграции, как статические, так и динамические, превышают негативные