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The Effectiveness of Creating a Common Energy Market in the Eurasian Economic Union

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ABSTRACT

The integration of energy markets (gas and oil) is accompanied with growing imbalance in the economic interests pursued by member states of the Eurasian Economic Union (EAEU). The evaluation was based on price and synergy factors (economies of scale), and the production function was solved by building a linear regression model. The model construction involved calculating the indicators of GDP elasticity that reflect changes in consumption and foreign trade for the period 2007 to 2018 and assessing the effects of the price factor (indices of growth in oil and gas transit prices and oil and gas export prices) on GDP changes when a common gas or oil market is created. Finally, the priority conditions for the integration of EAEU gas and oil markets were ascertained to allow the design of optimal scenarios for the establishment of a shared electricity market. The findings confirmed a synergistic effect, which manifests as an increase in GDP growth rate for each of the EAEU member states. The proposed approach enables a comprehensive evaluation of integration effectiveness on the basis of available relevant data.

INTRODUCTION

Stability in the energy sector is crucial for economic prosperity in the member states of the Eurasian Economic Union (EAEU) as these countries are rich in resources and collectively produce 14.6% and 17.3% of the world's oil and natural gas, respectively (The Common Energy Market of the Eurasian Economic Union, 2018). Such stability has been pursued through a traditional industry approach, which has instead caused imbalance given the difficulty of identifying the development potential of the energy industry outside conventional areas of action (Burke a Stephens, 2018; Semin et al., 2019a). Under the conditions of dynamic economic development, therefore, the concept of synergistic effect has become the central aspect of an integrated approach to the expansion of the energy industry (Tang et al., 2018; Santamouris, 2019; Thellufsen and Lund, 2015). Under this scientific approach, energy is regarded not as a static product that needs to be evaluated and delivered but as a dynamic contribution that can bring about economic and social benefits to a state (Santamouris, 2019; Thellufsen and Lund, 2015; Arto et al., 2016). It is an approach that focuses on the relationship between improved energy supply and elevated development potential (Bergasse, 2013). The problem is that many countries do not have enough natural hydrocarbon reserves or capacities to promote competition (breaking up a monopoly) in the energy market and meet the needs of the national economy. Nevertheless, such issue can be solved by individual countries or regions through the creation of a common regional energy market (Nangia, 2019)—a strategy that has been verified effective, in practice, in reducing the market share of monopolistic companies and increasing the number of entrants into the market (Nangia, 2019; Madyo, 2008). Regional integration also improves the operation of an entire system, thereby eliminating border issues and facilitating integrated production, network operation, and trade (Madyo, 2008; Dugstad, 2019). A success story in this regard is represented by the regional electricity markets created in Nordic countries 10 years ago (Deryabin and Antyushina, 2008). Over time, the focus has shifted to the consolidation of energy markets in neighbouring countries, which is a trend observed in Europe, the USA, and some other regions (Dugstad, 2019).

In Europe, various regional initiatives are aimed at developing regional markets for electricity and gas. Similarly, the United States uses a standard market model based on the concept of regional wholesale markets regulated by independent system operators (ISOs) and/or regional transmission organizations (RTOs) (Hartman, 2016). The same tendency manifests itself in Eastern Europe. Given that many energy markets in EAEU member states seek to establish a competitive integrated space, the draft Concept for the Formation of the EAEU Common Electricity Market was approved on March 10, 2015. This document outlines the main stages, goals, and objectives of the formation and development of the energy market and the methods by which its participants interact (On the Concept for the Formation of a Common Electricity Market of the Eurasian Economic Union, 2015). It implies that the establishment of common energy markets is to ensure the stable supply of energy resources to the national markets of participating states, enhance their energy security (both in terms of supply and demand), and foster their positions in global energy markets. In terms of geographical scope, a consolidated market would represent one of the world's largest commercial energy arenas, strategically located between Europe and Asia and encompassing a population of about 182 million (The Common Energy Market of the Eurasian Economic Union, 2018). The EAEU common energy market is a system of relationships among participants in the domestic gas, oil and electricity markets of member states that buy and sell hydrocarbons, electric energy (power capacity), and related services and that act on the basis of general rules and relevant agreements (Eurasian Economic Treaty Union, 2014). Integrating EAEU energy markets can engender major effectiveness gains in welfare terms to consumers and industries. Energy markets can be further consolidated through a process of market coupling, which also produces effectiveness benefits owing to its more efficacious use of generation capacity and the consequent reduction in the need for large but idle productive capability (Böckers, 2013). The potential for savings is indicated by the sharing of diverging high-peak periods among member states. The larger the share of divergence, the greater the generation capacity gained in utilization. While market coupling theoretically increases market effectiveness, issues such as market design or other regu-

latory interventions significantly affect the performance of market coupling. Therefore, aligning the different existing national regulatory frameworks across the EAEU or setting up a new common framework altogether is important. According to the Concept, the common energy market is formed on the basis of parallel electric power systems and capacities. It will have uniform technical norms and rules, as well as coordinated energy balances (On the Concept for the Formation of a Common Electricity Market of the Eurasian Economic Union, 2015). However, objectively, creating a common oil and gas market is first necessary. The countries that participate in the integration have various models and conditions of their energy markets' operation. This condition results in the imbalance of interests. For example, Kazakhstan and Belarus seek to differentiate tariffs between exports and domestic deliveries, while Russia wants all tariffs to be the same for all types of shipments (Gnutzmann-Mkrtchyan, 2013). Kazakhstan and Belarus would like to unify quality standards, while Russia believes such an approach is unrealistic since oil and oil products are streamed from different fields, and this situation would inevitably lead to significant expenses (The Common Energy Market of the Eurasian Economic Union, 2018). The integration process in the electric energy industry, as in any other field, brings about different effects for the countries of the integration association. The goal of this study is to develop an approach to estimate the economic efficiency of energy market integration for each EAEU member state (Fedorenko et al., 2016). The study describes the main conflict of interests of net exporters and net importers of hydrocarbons during the integration of the EAEU's energy markets. Results show that the factors of price and economies of scale are the key to economic efficiency during the integration of energy markets. By solving the production function and performing regression analysis (Chikunov et al., 2019), the authors showed that in modern conditions the creation of a common oil and gas market has a positive synergistic effect in all EAEU countries that manifests itself through GDP growth (Osipov et al., 2019).

2. LITERATURE REVIEW

Under modern conditions, the creation of common EAEU markets is not only timely, but also a fairly innovative measure. As a matter of fact, except for a very specific and narrowly applicable integration model implemented in the European Union, no one has yet proposed other efficient integration projects. However, such work has begun (a recent example is the GEIDCO Chinese project in the electric power industry (Cornell, 2019)). The EAEU can present its own model of broad Eurasian integration to neighbouring countries, including China, Japan, the Republic of Korea, Iran, the European Union, and others. The attractiveness of this project depends on the characteristics of the model itself and its viability. The decision to form a common electricity market for the EAEU member states drew researchers' attention to the issues related to evaluating the economic efficiency of cross-border integration of electric power complexes, which is reflected in numerous scientific publications.

Research papers provide a range of approaches to evaluating the effectiveness of regional energy systems and markets integration (Batten et al., 2019; Li, Zhang and Andrews-Speed, 2019; Aalto, 2014; Leal, Rego and Ribeiro, 2019). The integration of energy markets has been studied mainly as part of the creation of a common energy market of the European Union (EU). In 2005, Copenhagen Economics attempted a preliminary evaluation of the possible consequences of launching a common European electricity market based on the data for the period from 1990 to 2003. The goal of that research was to evaluate its impact on electricity prices caused by the synergistic effect for consumers in the integrated electricity market (Copenhagen Economics, 2005). The study consisted of several stages: measuring the market opening at the national level, an econometric evaluation of the impact of the market opening on electric power indicators of individual countries, and finally, the evaluation of the overall economic impact using the general equilibrium model of the European economy. It was established that the market opening had a significant impact on national productivity, and the researchers estimated that a long-term impact on electricity could manifest itself as a 7–8% price reduction (Sheng, Shi and Zhang, 2013).

Dealing with these issues, scientists also widely applied the scenario modelling approach: using the world gas market model and the least cost method, they determined the differences between various scenarios of energy market integration (Volkart, Mutel and Panos, 2018; Shi, Variamand and Shen, 2019).

Research papers from the EAEU countries mainly consider different aspects of creating an integrated electricity market in the Eurasian Union. The authors explored the issues of organizing cross-border trade in electric power (Salimonenko, 2017), the specifics of electric power as a marketable product (Valeeva, 2017), and presented proposals for building an effective model of cross-border trade in electric power in the EAEU (Filippova, 2018; Arifulova and Storozhenko, 2018). Scientists have developed methods for optimizing the costs of generating electricity, having considered different generation patterns in the EAEU countries (Matveev, 2017). However, it should be noted that creating common gas and oil markets is the first step for the integration of the electricity market of the EAEU countries. After this, the electricity market can be integrated in 2025 (Sargsyan, 2017). The creation of common markets will allow bringing together wholesale prices for gas, oil, oil products and electricity in the domestic markets of five EAEU countries. Definitely, there will still be regional differences, but these will be mainly due to transportation distances. That is, from the perspective of manufacturers, this will ensure the equal profitability of energy supplies over the largest part of the EAEU (with the exception of some isolated and inaccessible areas) (the EAEU Common Energy Market will create the infrastructure basis for the Union, 2017). It is difficult to predict whether prices will be stable and acceptable for consumers. At the same time, one should remember that common markets mainly influence wholesale trade, while a significant share of the final price is formed in retail. In the future, as cross-subsidies decrease, the role of retail will grow (The EAEU Common Energy Market will create the infrastructure basis for the Union, 2017). The creation of the common EAEU energy market should contribute to the economic development of the member states through greater energy security and effectiveness (The EAEU Agreement on the Common Electricity Market was signed, 2019). Higher effectiveness is not an obvious result for all the countries as they have formed different levels of energy prices. The formation of an equilibrium price in a single market at a level lower than the export price of an individual country will increase the economic benefits of importing countries and reduce the economic benefits of energy exporting countries. Reaching an equilibrium price in the common market at a level higher than the export price of an individual country will have the opposite effect for importing and exporting countries. The imbalance of economic benefits associated with the integration of energy markets is also due to the cost of hydrocarbons transit. Cancelation of transit fees, as provided for by the conditions for creating a common market (Mgdesyan, 2017; Osipov et al., 2018), will be beneficial for importing countries and not good for countries involved in the transit of energy resources (primarily Russia and Kazakhstan).

Modern scientific approaches mostly address the issues of electricity market integration. They do not consider the matter consistently and require expensive or inaccessible detailed data, especially in the developing EAEU member countries. Therefore, we aimed to develop a method for evaluating energy transition strategies adapted to the conditions of the countries in which they are to be implemented and to consider them with a holistic approach that would ensure the evaluation of the economic effect (change in GDP) for each EAEU country.

3. METHODS AND MATERIALS

As we have already said, the effectiveness of energy markets integration primarily depends on the factors of price and economies of scale obtained by combining economies and individual industries (Wang and Feng, 2019). Therefore, the proposed methodology for evaluating the effectiveness of creating a common energy market involves evaluating the influence of the price factor (change in the price of export and transit) and the synergy factor (synergistic effect from this combination).

When evaluating the effectiveness, one should consider changes in GDP—an indicator that reflects the efficiency of the whole economy and the oil and gas sector in particular. To determine the impact of the synergy factor on changes in GDP, we used the production function:

$$Y_1 = \alpha_0 \times X_1^{\alpha_1} \times X_2^{\alpha_2}, \quad (1)$$

where Y_1 is the GDP indicator, billion USD;
X_1 is oil/gas consumption in the country, million tons;
X_2 is net export of oil/gas in the country, million tons;
α_0 is the intercept term;
$\alpha_1 - \alpha_2$ are indicators of the elasticity of GDP changes from factors $X_1 - X_2$, respectively.

The type of the model (formula 1) was chosen by the analogy with the Cobb-Douglas production function which is used to evaluate the influence of production factors on production volumes (Vîlcu, 2011). At the macro level, GDP is an indicator of production volumes. Since we are examining the oil and gas industry, the indicator of this sector that influences GDP was selected as the production factor. This is the volume of consumption—the greater the consumption of energy, the larger are the volume of production and the indicators of export and import of energy resources.

Since the production function does not include negative values, the indicator X2 for importing countries was calculated as the difference between import and export. This indicator has the following economic interpretation: importing countries receive almost no profit from energy exports, and imported energy resources are a factor of production, which, when used effectively, increases the profit of enterprises and GDP. The economic development of a country exporting energy resources is ensured by revenues from the export of hydrocarbons, whereas import is associated with expenditures (Vasiljeva et al., 2019).

The chosen model (formula 1) allowed evaluating the effectiveness of the integrative energy association within the Eurasian Union. Since the integration of energy markets produces a synergistic effect (manifesting itself in economies of scale when creating a common market), it does not seem accurate to calculate the total effect from the creation of a common energy market as a sum of individual GDPs of the EAEU member states.

We analysed the model of creating a common market with the production function (1) to determine the presence of super-additive synergy that means long-term advantages of integration associations arising from access to new markets, development of corporate and competitive potential, and diversification of production (Filippova, 2018).

We used a multifactor linear regression model to solve the production function (1). For this, the logarithm was taken of both parts of the equality, and the function was reduced to a multifactor regression model:

$$lnY_1 = lna_0 + a_1 lnX_1 + a_2 lnX_2 \rightarrow \overline{\overline{Y}} = \overline{\overline{a}}_0 + a_1 \times \overline{\overline{X}}_1 + a_2 \times \overline{\overline{X}}_2, \quad (2)$$

where $\overline{\overline{Y}} = lnY_1$; $\overline{\overline{a}}_0 = lna_0$; $\overline{\overline{X}}_1 = lnX_1$; $\overline{\overline{X}}_2 = lnX_2$ (from function 1);
$\overline{\overline{a}}_0$ is the intercept term;
$a_1 - a_2$ are coefficients for independent variables—model elasticity coefficients (1).

The influence of the price factor on economic efficiency was evaluated with a linear regression model, in which the dependent variable is the index of change in GDP (growth rate of each EAEU member state) (Y_2), while independent variables are export price indices (X_3) and transit price indices (X_4):

$$Y_2 = a_0 + a_3 \times X_3 + a_4 \times X_4, \quad (3)$$

This model type was chosen since the relationship between the dependent and independent variables is linear. Relative values—growth rates—were taken as dependent and independent variables in order to ensure the commensurability of the indicators. Modeling is more accurate if one uses the same units of measure and the same dimension. The GDP growth rate is the dependent variable in the model (3). In both functions (formulas 1 and 3), absolute or relative values of GDP were used for final evaluation of the total change in GDP under the influence of the synergetic and price factors. Independent variables are the price indicators that will change after creating a common energy market: the growth rate of the export price and the growth rate of the transit cost (Semin, 2019b). The model was built to evaluate the change in GDP of each EAEU member state regarding its oil and gas market. Unknown model parameters (2)-(3) ($\mathbf{a_0} - \mathbf{a_4}$) were determined in Statistica 12.0 software with the multifactor linear regression method.

4. DATA

In this study, we imposed a system of certain limitations. First, we evaluated the effectiveness of creating common oil and gas market since the creation of such markets is the priority for the EAEU member states during the integration of energy markets. After this, it is possible to build an integrated electricity market (The common EAEU electricity market: it won't work without gas, 2019). The creation of a common electricity market is a long-term project (the stipulated implementation period is up to 2025) (Sargsyan, 2017). During this period, the political and economic conditions of the agreement may change. Therefore, one cannot model the long term effectiveness of creating a common market with a high degree of reliability, so it is not viable. Oil and gas are key components in the structure of the total consumption of primary fuel and energy resources of the EAEU for 2018 (72.2%) (EAEU Statistics, 2019). Second, the efficiency is understood as the GDP growth of a country participating in the integration of energy markets. Since there are no statistical data for the EAEU countries regarding the energy efficiency indicator (EROEI) that most accurately characterizes efficiency, we used GDP as the resulting indicator—an indicator of the overall performance of business entities and the state, whose level significantly depends on the efficiency of the oil and gas market. Third, the export price is measured as the price of Russia's oil and gas exports, which is the main producer and exporter of energy resources to the EAEU countries. Fourth, we evaluated the effectiveness of creating a common market separately for each EAEU country. Such a decision can be explained by the heterogeneity of the data sample on the volumes of oil and gas exports and imports in the studied countries, as well as the differentiated effect of the price level and transit volumes for the exporting and importing countries.

The most significant factors that change first when a common market is created are price and transit fees (Mgdesyan, 2017). Investments in the technological process are secondary tasks in the integration of energy markets integration; therefore, in this study, the costs of energy production and processing are constant values and were not taken into account in the efficiency evaluation model. At the same time, the synergistic effect occurring due to increased production (the capacities of several countries are combined), greater consumption, export, and import may lead to a change in total costs, which will influence changes in GDP. We put forward the hypothesis that the creation of a common market of the EAEU countries is characterized by a synergistic effect. This hypothesis was verified with the production function (formula 1). For this purpose, and to evaluate the effectiveness of the formation of common oil and gas markets, we used the following indicator values for the period from 2007 to 2018:

- GDP of the EAEU countries (Armenia, Belarus, Kazakhstan, Kyrgyzstan, Russia), billion USD;
- Oil and gas consumption in the EAEU countries in physical units, million tons and million m^3, respectively;
- Oil and gas imports to the EAEU countries in physical units, million tons and million m^3, respectively;
- Oil and gas exports by the EAEU countries in physical units, million tons and million m^3, respec-

tively;

- Transit cost of oil (USD per ton) and gas (USD per 1000 m³/100 km);
- Price of oil and gas exported by Russia.

A model for evaluating the effectiveness of a common market included Russia, Kazakhstan, Belarus, the Kyrgyz Republic, and Armenia (EAEU Statistics, 2019; World Data Atlas, 2019; National Statistics Committee of the Kyrgyz Republic, 2019; Federal State Statistics Service, 2019; Ministry of National Economy of the Republic of Kazakhstan, Statistics Committee, 2019; National Statistical Committee of the Republic of Belarus, 2019; Statistical Committee of the Republic of Armenia, 2019).

5. RESULTS

Having solved functions (1)–(3), we obtained multifactor regression estimates of the effectiveness (change in GDP) of creating a common oil and gas market in the EAEU (Table 1).

Table 1. Models for evaluating the economic efficiency of integrating oil/gas markets of the EAEU member states

Country	Model for efficiency evaluation (by the price factor)	Model for efficiency evaluation (by the synergy factor)
Integrated oil market		
Armenia	$Y_2 = 1.03 - 0.002 \times X_3 - 0.02 \times X_4$	$Y_1 = 19.65 \times X_1^{0.68} \times X_2^{0.83}$
Belarus	$Y_2 = 0.88 + 0.11 \times X_3 + 0.072 \times X_4$	$Y_1 = 0.37 \times X_1^{1.02} \times X_2^{1.01}$
Kazakhstan	$Y_2 = 0.85 + 0.14 \times X_3 + 0.028 \times X_4$	$Y_1 = 0.11 \times X_1^{1.05} \times X_2^{1.02}$
Kyrgyzstan	$Y_2 = 0.999 + 0.009 \times X_3 + 0.07 \times X_4$	$Y_1 = 17.79 \times X_1^{1.001} \times X_2^{1.01}$
Russia	$Y_2 = 0.88 + 0.11 \times X_3 + 0.093 \times X_4$	$Y_1 = 0.04 \times X_1^{1.05} \times X_2^{1.03}$
Annotation Y_1 is GDP, billion USD; Y_2 is GDP growth rate; X_1 is oil consumption, million tons; X_2 is net oil exports, million tons (for Belarus, Kazakhstan, Kyrgyzstan, Russia) and the difference between imports and exports, million tons (for Armenia); X_3 is the growth rate of export oil price set by Russia; X_4 is the growth rate of oil transit cost (average for the EAEU).		
Integrated gas market		
Armenia	$Y_2 = 1.87 - 0.30 \times X_3 - 0.41 \times X_4$	$Y_1 = 39.94 \times X_1^{0.81} \times X_2^{1.02}$
Belarus	$Y_2 = 0.63 + 0.28 \times X_3 + 0.11 \times X_4$	$Y_1 = 0.34 \times X_1^{1.03} \times X_2^{1.01}$
Kazakhstan	$Y_2 = -0.07 + 0.64 \times X_3 + 0.31 \times X_4$	$Y_1 = 0.31 \times X_1^{1.09} \times X_2^{1.04}$
Kyrgyzstan	$Y_2 = 1.51 - 0.21 \times X_3 - 0.21 \times X_4$	$Y_1 = 37.16 \times X_1^{0.78} \times X_2^{1.02}$
Russia	$Y_2 = -0.15 + 0.83 \times X_3 + 0.42 \times X_4$	$Y_1 = 0.02 \times X_1^{1.03} \times X_2^{0.98}$
Annotation Y_1 is GDP, billion USD; Y_2 is GDP growth rate; X_1 is gas consumption, million m³; X_2 is net gas exports, million m³ (for Belarus, Kazakhstan, Russia) and the difference between imports and exports, million m³ (for Armenia and Kyrgyzstan); X_3 is the growth rate of export gas price set by Russia; X_4 is the growth rate of gas transit cost (average for the EAEU).		

The adequacy of the constructed models for evaluating the efficiency of creating a common oil and gas market is proven by the values of determination coefficients (**R2**) exceeding 0.8, and higher values of the F-test than in Table 1 (4.26 at **p** = 0.05).

The constructed functions revealed the following patterns in the formation of common energy markets of the EAEU member states:

- Energy exporting countries (Russia, Kazakhstan, Belarus, Kyrgyzstan—oil; Russia, Kazakhstan, Belarus—gas) benefit from creating a common market due to the super-additive effect of an increase in total consumption and export (**α1> 1, α2> 1**). That is, an increase in total oil consumption by 1% will lead to an increase in Russia's GDP by 1.05%, Kazakhstan—by 1.05%, Belarus—by 1.02%, and Kyrgyzstan—by 1.001%. A 1% increase in gas consumption will lead to

an increase in Russia's GDP by 1.03%, Kazakhstan—by 1.09%, and Belarus—by 1.03%. An increase in net oil exports by 1% will lead to an increase in Russia's GDP by 1.03%, Kazakhstan—by 1.02%, Belarus—by 1.01%, and Kyrgyzstan—by 1.01%. An increase in net gas exports by 1% will result in an increase in Russia's GDP by 0.98%, Kazakhstan—by 1.04%, and Kyrgyzstan—by 1.02%. A positive effect from market integration is due to the access to labour and capital resources of the EAEU countries, rational territorial redistribution of production, processing, and energy consumption, which will reduce logistics costs and expenses associated with the processing of energy resources. This confirms the hypothesis that there is a synergistic effect when a common market is created.

- Energy importing countries (Armenia imports oil and gas, and Kyrgyzstan imports gas) experience a positive impact on their GDP from an increase in hydrocarbon consumption and, consequently, an increase in their import ($\alpha1 > 0$, $\alpha2 > 0$); it is achieved by lifting import restrictions and reducing fixed costs.
- The creation of a common market implies the cancellation of transit fees for the Union countries, which will positively influence the economies of the importing countries ($\alpha4 < 0$). For exporting countries, a decrease in transit fees will have a negative impact on the economy ($\alpha4 < 0$).

To quantify the synergistic effect on the creation of a common oil and gas market for each country, we estimated indicator **Y1** in the model from Table 1. Indicator **X1** was replaced with the volume of total oil and gas consumption (separately for each market) that was calculated as the sum of the corresponding indicator for the EAEU countries for 2018, and **X2** was replaced with the total volumes of net oil and gas exports for the EAEU for 2018. The effect was calculated as a relative deviation of the calculated values of **Y1** from the real GDP of the EAEU countries for 2018.

To determine the effect of the price factor, the value of **X4** = 0 (the result of cancelling the transit fee) was introduced into the model (Table 1). The changes in GDP due to the cancellation of transit fees correspond to the calculated value of indicator **Y2**. The calculated results of the creation of common oil and gas markets are given in Table 2.

Table 2. Indicators of the effectiveness of creating a common oil/gas market of the EAEU member states

Country	*Changes in GDP, %*		
	The impact of the synergy factor	*The impact of the price factor*	*Total change*
Integrated oil market			
Armenia	0.02	2.79	2.81
Belarus	0.80	-0.60	0.19
Kazakhstan	0.90	-0.50	0.40
Kyrgyzstan	0.01	0.83	0.84
Russia	1.00	-0.60	0.39
Integrated gas market			
Armenia	0.10	0.32	0.42
Belarus	0.30	-0.18	0.12
Kazakhstan	0.90	-0.82	0.07
Kyrgyzstan	0.08	1.77	1.85
Russia	0.40	-0.14	0.26

The creation of common oil and gas markets will have a positive synergetic effect in all EAEU countries that will manifest itself as an increase in GDP. Such changes will be the most significant in less developed countries importing energy resources. Positive changes are primarily due to the cancellation of energy transit fees. For more developed countries, mainly export-oriented, the negative impact of cancelling transit fees is eliminated by a positive synergistic effect leading to an increase in their GDP.

6. DISCUSSION

Creating a common market, it is necessary to keep in mind not only its general purpose, but also the specific task to be solved for each particular country. This can be achieved only by determining the synergistic effect of integrating the energy market into the economy as a whole. These factors and their influence have been studied by modern researchers, as we have mentioned above. However, the focus has been made on reducing the price of electricity for the population (Nangia, 2019; Knaut and Paschmann, 2019). However, researchers have not examined such an objective condition for the integration of the EAEU countries as the synergistic effect for the economies of the participating countries due to the common gas/oil market.

In contrast to scenario modeling (Volkart, Mutel and Panos, 2018; Shi, Variam & Shen, 2019), the production function allowed us to study not only the combination of the price factor and the synergy factor, but also to take into account the interests of both categories of the countries—hydrocarbon exporters and importers. The previous experience of the CIS and the EurAsEC demonstrates that the creation of common markets and mutual integration have always been associated with different goals of the participants (Vartanova, 2018). The key aspect here is developing an attractive model of energy integration. The countries participating in the integration have different models and operating conditions of the electricity markets. Russia and Kazakhstan are active exporters of hydrocarbons, whereas the rest of the EAEU member countries are importers. That is, the former are interested in selling the product with profit, while the latter want to buy it at a lower price. Trade and economic conflicts in the common market are virtually inevitable. The transfer of oil and gas from Russia to other EAEU members is a crucial redistribution mechanism and a prerequisite for obtaining potential positive economic effects within the integrated EAEU energy market. In other words, Member States do not pay export tariffs for energy imports. In fact, this means that Russia provides indirect subsidies by selling gas and oil in the EAEU cheaper than the world market prices. For example, the Belarusian economy is highly dependent on Russian hydrocarbons. Belarus imports Russian crude oil (of which 45-50% is used for the production of petroleum products for export) and natural gas (that is not re-exported directly) at lower than market prices. For instance, purchasing Russian gas at USD 173 per 1000 cubic meters (for comparison, its price for Armenia is USD 250 and for Ukraine—USD 430), Belarus is exempted from paying the export tariff (30% of the price of a barrel of oil). As a result, the Russian budget loses about USD 73 per 1000 cubic meters or USD 9.5 million in total (USD 8.5 million for oil and USD 1 million for gas) (The Common Energy Market of the Eurasian Economic Union, 2018). The situation with Armenia is somewhat similar: after it joined the EAEU, the gas import price was reduced from USD 271 in 2014 to USD 189 in 2015. This means the Russian budget does not receive USD 82 from each 1000 cubic meters of gas exported, and which in total corresponds to 2% of Armenia's GDP (The Common Energy Market of the Eurasian Economic Union, 2018). The proposed model for evaluating the effectiveness considers the fundamental factors in the imbalance of the EAEU economic interests. Compromise on these differences has been reached in the Concept for the Formation of a Common Electricity Market of the Eurasian Economic Union. The developed model is based on available and relevant statistics. The variables of the regression models for evaluating the economic efficiency of the EAEU energy markets are reduced to the same dimension (growth rates), which allowed us to develop adequate evaluation models. By applying the proposed approach, we could evaluate the impact on the economy of each participant (country) at the stage of energy markets integration and determine optimal conditions of the integration, even if at first glance they do not seem so attractive. The study proved that integrating the energy markets of EAEU members increases GDP growth; this is because price smoothing increases the economic stability of both net exporters and net porters of oil and gas.

The economic situation is constantly changing, and these changes affect the energy sector. Any change in the energy balance has a socioeconomic effect; therefore, the results of this study are relevant in the short term. We believe this issue should be studied further because it is essential to understand all Eurasian Economic Union processes when creating a common energy market.

CONCLUSION

In this study, we proposed an approach to evaluating the economic efficiency of EAEU gas and oil market integration. We used the production function and the linear regression model and reflected the price factor influence. This approach allowed us to determine the cumulative effect of such economic characteristics of energy market integration as the prices of gas/oil export and transit and consider the effect of the economies of scale on each EAEU member's GDP during integration. We empirically proved that integrating EAEU energy markets produces a positive synergistic effect that increases GDP. These changes will be most significant for less-developed countries importing energy resources, such as Armenia and Kyrgyzstan. Creating a common oil market will increase Armenia's GDP by 2.81% and Kyrgyzstan's by 0.84%; creating a common gas market will increase Armenia's GDP by 0.42% and Kyrgyzstan's by 1.85%. The cancellation of energy transit fees is the primary reason for these positive changes. For exporting countries, a positive synergistic effect eliminates the negative impact of cancelling transit fees, which ensures a higher GDP growth rate. Therefore, the formation of common markets will mean a more efficient use of the EAEU's great energy potential, solving the national economies' energy supply problems, expanding export opportunities and transit potential, and increasing the energy sector's resilience and infrastructure. Oil and gas market prices will be more predictable and will not depend on speculative dynamics in international markets.

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