

## ASSESSMENT OF THE IMPACT OF CUSTOMS REGULATION FACTOR ON FOREIGN TRADE OF KAZAKHSTAN<sup>4</sup>

*The development of Kazakhstan's foreign trade is a central factor in Kazakhstan's economic growth, and therefore it is important to understand which trade procedures have a negative and positive aspect on the development of trade relations between countries. Customs procedures are an integral part of the passage of international borders. It is significant that such procedures do not have a negative impact on trade. The article on the basis of the gravitational model of foreign trade assesses the influence of the factor of customs regulation, namely the implementation of customs procedures at the border for the development of exports and imports of Kazakhstan. The models are based on bilateral trade data from Kazakhstan with 53 countries for the period 1995-2021, with partner countries divided into three groups depending on the income level of the countries to obtain better results. Independent variables reflecting customs regulation were countries' participation in the Revised Kyoto Convention (RKC), time and cost of customs formalities at the border according to the World Bank Report «Doing Business» (Trading across borders). The study concluded on the impact of customs regulation on the foreign trade of Kazakhstan, with the time factor playing a more significant role than transaction costs on customs clearance. At the same time, the participation of countries in the RKC has a positive impact on the development of bilateral trade. The assessment of the impact of customs procedures on the development of foreign trade confirms the need for customs regulatory reforms.*

*Keywords: customs regulation; customs procedures; foreign trade; gravity model; trade and customs policy*

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## 1. Introduction

The foreign trade of states is an important component of the development of economic integration processes, in which virtually all countries of the world are involved. Through international trade, countries are filling their own resource gaps and have the opportunity to profit by trading a surplus of domestic production. A well-designed trade policy provides the impetus for the sustainable development of a country's economy.

The Republic of Kazakhstan, like most of the countries of the former Soviet Union, is a small open economy characterized by dependence on foreign trade. This fact suggests that it is important for economic development to understand which factors have a positive impact on the change in imports and exports.

In recent decades, it has become clear that the simplification and harmonization of procedures related to international trade are significantly increasing its volume. Many international organizations, the main ones being the World Trade Organization (WTO) and the World Customs Organization (WCO), have as their main objective to make trade as smooth, predictable and free as possible.

Trade facilitation implies the modernization, standardization and harmonization of trade procedures for exports and imports (WTO, 2015a). In other words, the entire trade facilitation process, which affects both business and the State, is aimed at reducing the transaction costs of foreign trade.

An important role in the implementation of the trade in goods between countries is played by customs regulation, namely the activities of customs authorities to establish the order and conditions for the movement of goods across the customs border. The world's customs administrations are undergoing global changes to the extent that the country is developed. Such reforms are based on the « provision of digital solutions to expand on trade facilitation and improve risk management» (WCO, 2022).

The main purpose of this paper is to try to assess the impact of the customs facilitation process, as part of the above trade processes, on the development of imports and exports of the country on the example of Kazakhstan's trade with a group of countries with different income levels through the construction of a gravity model, which is a convenient tool, relevant for research.

The gravitational model proposed in this paper is based on the variables that most accurately characterize the impact of customs regulations on foreign trade: participation of countries in the RKC as well as the time and financial costs incurred by exporters and importers to pass the formalities at the border based on the World Bank Report «Doing Business», «Trading borders across», taking into account the level of economic development of the partner countries of Kazakhstan.

Previous studies have shown that the application of the rules of the RKC guarantees substantial economic and non-economic benefits. Such advantages may also include decreasing the trading costs of participants in international trade (Yasui, 2010). Despite the fact that the administration of the World Bank has refused to compile the ranking of countries

according to the terms of doing business «Doing Business», these reports are an indicative tool to assess the state of international trade.

In constructing the proposed models, we assume that variables based on World Bank data, related to importers' and exporters' costs of administrative procedures at the customs border, are factors of customs regulation. Given that the level of improvement, including digitalization of customs processes mentioned by WCO, is at different stages of application, models in this paper are based on trade flows of countries according to their level of income. In our opinion, such an approach will allow us to see more accurately the impact of customs regulation of foreign trade on the imports and exports of Kazakhstan depending on the level of development of the partner country.

The results obtained in this article can be used for research in the field of trade and customs policy, as well as serve as an evidence base for managerial decisions in customs regulation and for the formation of trade policy.

## **2. Literary Review**

The State's trade policy in the field of trade facilitation is closely related to other aspects of its economic and political life, which are often very difficult to change (Hillberry and Zhang, 2018). In particular, it is aimed at finding improvements in the trading environment aimed at reducing transaction costs between businesses and government. Thus, both business and government stakeholders benefit from the goals of trade facilitation, harmonization, standardization and modernization. It should be noted that the international trading environment is complex and the implementation of concepts and recommendations on trade facilitation is carried out with obstacles (Grainger, 2008).

One of the papers notes that the importance of customs remains and will be a priority in the development of foreign trade, regardless of whether trade facilitation will be decisive in the implementation of the country's trade policy. This situation is explained by the fact that customs will continue to be responsible for the effective management of borders in order to facilitate trade. This function of customs authorities plays a significant role in the formation of the country's international competitiveness (De Wulf, 2005). At the same time, during a certain period of growth in international trade, technology and other factors, the customs administrations of the world found themselves under institutional pressure, when it is necessary to balance supply chain security, replenishment of the state budget and trade facilitation. This conclusion was reached by a Jordanian researcher (Alsharari, 2022).

In the field of studying the effects of foreign trade, there are papers about the impact of the development of customs procedures on the change of bilateral trade, for example, the hypothesis of a rise in trade flows between Singapore and Japan, as a result of automation of customs regulation processes (Hertel, 2001), has been proved. In another paper, based on an econometric analysis of World Bank data, an interesting conclusion is made that countries with simpler customs procedures reduce the time spent on imports, while trade facilitation policies are more effective in countries with high incomes and better governance institutions (Hillberry, Zhang, 2018). In addition, there have been numerous studies of various factors

influencing the development of international trade based on the gravitational model, starting with the work of Linder (1961), Tinbergen (1962) and Linnemann (1966). The popularity of this empirical model is explained by the fact that gravity models play a leading role in explaining trade flows (Wilson, 2005).

Classical gravity models are based on the study of the development of bilateral trade of countries in direct relation to their size (GDP) and inversely to the distance between them. To understand what other factors, affect international trade, researchers include various explanatory variables, such as the language of communication in trading countries, the commonality of their borders and much more. For example, more than 70 variables for the development of trade between European countries, including the time of participation in the European Union, the Euro area, etc., have been assessed by means of a gravity model (Beck, 2020).

At the same time, there are other types of gravitational models that consider, for example, the impact of trade facilitation processes on changes in foreign direct investment flows (Onyango, Kiriti-Nganga, 2016), the impact of migratory flows (Arcangelis, 2022) or carbon emissions (Zhao, 2022) to develop the country's imports and exports.

Its own interpretation of the gravitational model is presented in the work of Zlatinov, Kosev & Shalamanov, which considered the influence of the production, internal electricity consumption, as well as regulations in the field of electricity export to change the growth of electricity exports of the countries of South-Eastern Europe (Zlatinov, 2022).

Past researches to achieve a goal similar to our work, based on the construction of a gravitational model, showed the following results.

To study the impact of trade facilitation on trade flows in Asia and the Pacific, John S. Wilson and others (Wilson, 2003) used country data on port efficiency, customs environment, e-business usage and many other factors. At the same time, the customs environment was understood as an integrated index consisting of an assessment of hidden import barriers, import fees, corruption, etc. The study found that customs facilitation enhances international trade opportunities, but to a lesser degree than improving port efficiency in partner countries.

The same group of authors later attempts to evaluate by means of the gravitational model of the theory of international trade, also using the variable «customs environment», which in this study consists of hidden barriers and bribes in the customs authorities. The results of the model showed that the country's exports are growing with improved customs procedures in the partner country, as well as the simplification of customs formalities can significantly reduce the cost of imports even if the customs tariffs are unchanged (Wilson, 2005).

The difference between Wilson and the present study on the impact of customs on imports and exports lies in the nature of partner countries of Kazakhstan, which in our study are grouped by income level, in the content of the variable «customs environment» as well as our consideration of changes in the level of customs procedures in both importing and exporting countries.

Another approach to assessing the impact of changes in trade procedures in Central Asian countries on foreign trade has been taken by researchers through the World Bank's Logistics

Performance Index (LPI) in the gravity model, including an indicator «Efficiency of customs services». The study also confirmed the finding that trade facilitation in Central Asian countries is making progress in trade (Felipe, Kumar, 2012). The models, constructed in this paper, show a picture of the impact on international trade of a set of factors, without highlighting progress in customs regulation separately, as such a goal was not set by researchers.

Another study of the impact of temporary delays in the delivery of goods from the sender's warehouses to the ship on international trade in 98 countries showed that each additional day of delay of goods reduces turnover by 1% (Djankov, 2006). The article under consideration also uses data from Doing Business regarding the time of delivery, but this indicator reveals problems of a different nature than the questions of our research.

Toševska-Trpčevska & Tevdovski (Toševska-Trpčevska, 2014) also use Doing Business data in their work on the impact of customs and administrative procedures on the trade of South-Eastern European countries. However, in assessing customs and administrative procedures, researchers have used the time and cost for documentary confirmation to export and import, associated with compliance with the requirements of all government agencies of the origin economy, the destination economy and any transit economies. The study concluded that the countries involved in the modelling needed to have more influence on the adoption of measures to reduce the time and costs required for border crossing.

The difference between the data reflected in the study of Toševska-Trpčevska & Tevdovski and our work is the key variables were information on time and costs, the exporter and importer incurred in the crossing of customs clearance and customs inspection as the main and resource-intensive types of government control at the border.

### **3. Methodology**

The paper proposed several models for analysis based on various studies related to the application of the gravity model of international trade.

The first part of this section describes gravitational models of foreign trade on the example of foreign trade operations of the Republic of Kazakhstan with 53 partner countries during the period 1995-2021. The second part contains descriptions of each of the variables and sources of information used for their generation.

#### *3.1. The Empirical Model*

The Model 1 hypothesis: The similarity of customs procedures applied in trade partner countries to simplify and harmonize them has a positive impact on the development of a country's foreign trade.

The RKC, which entered into force on 3 February 2006, is a model of modern and efficient customs procedures in this century and contributes to trade facilitation and effective State control of goods, moving across customs borders (WCO, 2008).

Therefore, the hypothesis is based on the assumption that the participation of partner countries in the RKC suggests a commonality and similarity of customs procedures in both countries.

The Model 1 is thus as follows:

$$LNTRADE_{Kj} = \beta_0 + \beta_1 LNGDP_{Kj} + \beta_2 LNDIST_{Kj} + \beta_3 RKC_{dummy} + \varepsilon \quad (1)$$

where:

$GDP_{Kj}$  is the real GDP of Kazakhstan and other countries;

$DIST_{Kj}$  is the distance between countries;

$RKC\_dummy$  is a dummy variable reflecting the fact of the country's participation in the RKC.

This model is not complicated by additional variables common in the construction of gravity models of foreign trade, in order to avoid the effects of multicollinearity and other negative effects of a large number of predictors.

For Models 2-5, Kazakhstan's partner countries are divided into three income groups (World Bank classification for Doing Business): high income (30 observations), low and middle income (10) and upper middle income (12). This grouping is due to the wide variation in the time and cost spent on customs and other formalities at the border, depending on the development of the country. The proposed method will also make it possible to see what impact transaction costs of time and finance have depending on the level of development of the country.

The hypothesis for Models 2-5: the increase in time and cost spent on customs formalities at the counterparty's country border negatively affects the development of exports and imports of goods from Kazakhstan.

In order to avoid the multicollinearity of the TIME and COST variables, their separation was carried out:

$$LNIMP_{Kj} = \beta_0 + \beta_1 LNGDP_{Kj} + \beta_2 LNDIST_{Kj} + \beta_3 LNTIME_{expj} + \varepsilon \quad (2)$$

$$LNIMP_{Kj} = \beta_0 + \beta_1 LNGDP_{Kj} + \beta_2 LNDIST_{Kj} + \beta_3 LNCOST_{expj} + \varepsilon \quad (3)$$

$$LNEXP_{Kj} = \beta_0 + \beta_1 LNGDP_{Kj} + \beta_2 LNDIST_{Kj} + \beta_3 LNTIME_{impj} + \varepsilon \quad (4)$$

$$LNEXP_{Kj} = \beta_0 + \beta_1 LNGDP_{Kj} + \beta_2 LNDIST_{Kj} + \beta_3 LNCOST_{impj} + \varepsilon \quad (5)$$

where:

$IMP_{Kj}$ ,  $EXP_{Kj}$  – import and export of Kazakhstan to the group of countries j;

$TIME_{expj}$ ,  $COST_{expj}$  – time and cost spent on compliance with customs rules in group of countries j when exporting to Kazakhstan;

$TIME_{impj}$ ,  $COST_{impj}$  – time and cost spent on compliance with customs regulations in the group of countries j when importing goods from Kazakhstan.

On the basis of the conclusions of the Models 2-5, Model 6 was constructed:

$$LNIMP_{Kj} = \beta_0 + \beta_1 LNGDP_{Kj} + \beta_2 LNDIST_{Kj} + \beta_3 LNTIME_{expj/impK} + \varepsilon \quad (6),$$

where:

$TIME_{expj/impK}$  – the ratio of time spent on customs formalities in the country of export of group of countries j, and time on customs clearance in Kazakhstan at import.

The hypothesis of this model is that the increase in the time spent on customs procedures in both countries has a negative impact on the growth of imports in Kazakhstan.

### 3.2 The Data

To construct the proposed models have been selected 53 countries which have accumulated with the Republic of Kazakhstan the largest volume of foreign trade in goods in 2021, namely more than 0.1% of total exports and imports in 2021. The study uses annual data from 1995 to 2021 to examine long-term factors affecting international trade.

At the same time, Table 1 provides information on the countries according to their income level according to the World Bank grouping for the Doing Business report, as well as the share of the country's foreign trade in the total foreign trade of Kazakhstan. Kazakhstan belongs to the third group of countries.

The International Monetary Fund database is the source of data on Kazakhstan's foreign trade with a group of selected countries. Information on the real GDP of the countries (base year 2015) is obtained from the World Bank Database. The distance between the countries is formed by the French research and expertise centre CEPII.

To construct the first model, additional information was used as of 25 June 2022 on the date of the signature without reservation or of deposit of instruments of ratification or accession to the International Convention on the Simplification and Harmonization of Customs Procedures (RKC) as amended, available on the World Customs Organization website (WCO, 2008).

Data for the key variables of the following models proposed in the study on the state of customs regulation are obtained from the historical data of the Doing Business Report of the World Bank for the period from 2015 to 2020. Although the World Bank administration has decided to abolish such a rating, it contains meaningful data on the time and transactions cost incurred by importers and exporters when crossing the customs borders of the States.

To solve the formed task to determine the role of customs regulation in the development of foreign trade, we focused on the indicator «Border compliance», because it reflects information on the implementation of requirements at the border, compliance with the customs regulations of the country (this segment includes the time and cost of customs clearance and customs clearance procedure customs inspection).

**Table 1. Income grouping of countries**

№	High-income countries	Share in trade turnover, 2021, %	Low-income and lower middle-income countries	Share in trade turnover, 2021, %	Upper middle-income countries	Share in trade turnover, 2021, %
1	Austria	0.22	Afghanistan	0.63	Algers	0.15
2	Belgium	0.56	Egypt	0.11	Azerbaijan	0.44
3	Brunei Darussalam	1.18	India	2.61	Brazil	0.23
4	Canada	0.66	Indonesia	0.24	Bulgaria	0.52
5	Croatia	0.91	Morocco	0.17	China	23.92
6	Czech Republic	0.34	Tajikistan	1.55	Georgia	0.12
7	Denmark	0.16	Pakistan	0.13	Iran	0.59
8	Finland	0.40	Ukraine	1.36	Malaysia	0.14
9	France	4.07	Uzbekistan	5.10	Mexico	0.23
10	Germany	2.92	Vietnam	0.57	Romania	2.09
11	Greece	1.79			Thailand	0.19
12	Hungary	0.18			Turkey	5.46
13	Ireland	0.19				
14	Israel	0.35				
15	Italy	12.97				
16	Japan	1.48				
17	Korea	3.52				
18	Lithuania	0.60				
19	Malta	0.39				
20	Netherlands	6.13				
21	Norway	0.11				
22	Poland	1.00				
23	Singapore	1.54				
24	Slovakia	0.11				
25	Spain	2.43				
26	Sweden	0.31				
27	Switzerland	1.71				
28	United Arab Emirates	0.93				
29	United Kingdom	1.55				
30	USA	2.95				

Source: Compiled by the author.

Next, consider approaches to the formation of variables for research.

The dependent variable for Model 1 is Kazakhstan's bilateral trade (K) with contracting countries (j), expressed by the natural logarithm of the sum of annual exports and imports between countries on average over the period 1995-2021 (53 observations) (Beck, 2020):

$$TRADE_{Kj} = \ln \left[ \frac{1}{T} \sum_{t=1}^T (IMPORT_{Kjt} + EXPORT_{Kjt}) \right] \quad (7)$$

The explanatory variable applied to each model is the real GDP resulting from (Beck, 2020):

$$GDP_{kj} = \frac{1}{T} \sum_{t=1}^T |GDP_j - GDP_K| \quad (8)$$



The  $DIST_{JK}$  variable is an indicator of the distance between the capitals of Kazakhstan and the contracting country, as these cities are often the centres of trade of the state.

The following variable is a dummy variable and one of the keys in this study, which defines the role of simplification and harmonization of customs procedures in the development of international trade ( $RKC\_dummy$ ). Its formation for «1» took a year, both countries were parties to the RKC, otherwise, this variable was assigned a value equal to «0». For the final construction of the dummy variable, the average for each country is taken.

Natural logarithms of average values for time and cost of customs procedures for the period 2015-2020 were taken in the formation of variables related to determining the impact of customs procedures on the development of foreign trade ( $TIME_{exp}$ ,  $TIME_{imp}$ ,  $COST_{exp}$ ,  $COST_{imp}$ ). The selected period is due to the revision and improvement of the methodology of rating formation on the indicator «Border compliance» since 2015.

For Model 5, an additional  $TIME_{expj/impK}$  variable was used, which is a natural logarithm of the ratio of the average index of the group of countries  $j$  for 2015-2020 «Time for export» to the average for the same period for the indicator «Time for import» of Kazakhstan.

At the same time, it should be noted that to obtain a logarithm of zero values according to the data of customs procedures assigned to 0.001 hours, which are translated in minutes. Similar to the value of customs procedures: value 0 was converted to 0.001 United States dollars, which has been transferred to American cents.

Calculations were made using EViews 12 Student Lite method of least squares.

#### 4. Results and Discussion

The modelling generated in the results is presented in Tables 2-4.

Table 2 shows the results of Model 1, aimed at understanding the role of country participation in the RKC. This model not only showed the expected results regarding the direct relationship of bilateral trade to the GDP of both countries and the inverse relationship of the explained variable to the distance between countries, but also confirmed the hypothesis that both countries' participation in the RKC implies an increase in States' imports and exports. At the same time, Model 1 reveals a significant direct relationship between the dummy variable and the dependent at the significance level of 5%.

**Table 2. Empirical Results of the Gravity Model 1**

Independent variables	LNTRADE <sub>Kj</sub> dependent variable for 53 observations		
	Coefficient	t-Statistic	p-value
$LNGDP_{Kj}$	1.006	5.317	0.000
$LNDIST_{Kj}$	-1.914	2.788	0.007
$RKC\_dummy$	3.461	1.927	0.059
Constant	11.674	2.146	0.036
R <sup>2</sup>	0.41		
F-statistic	11.34		

Although the determination factor is less than 50%, we assume the model is fairly stable, as it contains few variables for the reasons given above. All variables are significant, as confirmed by F-statistic.

The equation derived from model construction:

$$LNTRADE_{Kj} = 11,674 + 1,006LNGDP_{Kj} - 1,914\beta_2LNDIST_{Kj} + 3,461RKC_{dummy} \quad (9)$$

Table 3 presents the results of Models 2-6 for imports and exports of Kazakhstan with a group of high-income countries.

**Table 3. Results of Gravitational Models 2-6 with a high-income group of countries**

Independent variable	Dependent variable $LNIMP_{Kj}$		Dependent variable $LNEXP_{Kj}$		Dependent variable $LNIMP_{Kj}$
	Model 2	Model 3	Model 4	Model 5	Model 6
$LNGDP_{Kj}$	1,11 (0,000)*	1,13 (0,000)*	0,71 (0,000)*	0,70 (0,000)*	1,10 (0,000)*
$LNDIST_{Kj}$	- 3,84 (0,000)*	-3,71 (0,010)*	-1,21 (0,278)*	-0,82 (0,487)*	-3,84 (0,005)*
$LNTIME_{expj}$	-0,28 (0,046)*				
$LNCOST_{impj}$				-0,08 (0,216)*	
$LNTIME_{impj}$			-0,11 (0,358)*		
$LNCOST_{expj}$		-0,11 (0,190)*			
$LNTIME_{expj/impK}$					-1,36 (0,046)
Constant	24,23 (0,016)*	22,17 (0,035)*	7,15 (0,377)*	4,00 (0,645)*	24,24 (0,016)*
R <sup>2</sup>	0,54	0,49	0,42	0,44	0,53
F-statistic	10,01	8,44	6,27	6,68	10,01
No of Obs.	30	30	30	30	30

\* p-value data are in brackets, 5% level value

Based on Table 3, Models 2-5 show the inverse relationship of cost and time costs incurred in the group of j high-income countries, but only Model 2 has a significant variable ( $LNTIME_{expj}$ ). This model supports the assumption that the time spent by the exporter on the export of goods affects the import volumes of Kazakhstan, namely, by reducing export processing time in countries j by 10% will lead to more than 20% increase in Kazakhstan's imports.

Currently, the largest volume of goods imported into Kazakhstan is imports from the European Union countries (in 2021 – 24.8%). It can be assumed that the ease of customs procedures when sending goods from EU countries is an important factor in the development of trade with such countries.

The cost of the exporter in Model 3 showed a weak relationship. This can be explained by the fact that in the European Union countries, which are mainly high-income countries, there are no export processing costs.

A partial explanation for the fact that the importer's time and financial costs do not affect Kazakhstan's exports may be the policy in place to prioritize exports of manufactured products

Obtained equations for Models 2-5:

$$LNIMP_{Kj} = 24,23 + 1,11LNGDP_{Kj} - 3,84\beta_2LNDIST_{Kj} - 0,28\beta_3LNTIME_{expj} + \varepsilon \quad (10)$$

$$LNIMP_{Kj} = 22,17 + 1,13LNGDP_{Kj} - 3,71\beta_2LNDIST_{Kj} - 0,11\beta_3LNCOST_{expj} + \varepsilon \quad (11)$$

$$LNEXP_{Kj} = 7,15 + 0,71LNGDP_{Kj} - 1,21LNDIST_{Kj} - 0,11\beta_3LNTIME_{impj} + \varepsilon \quad (12)$$

$$LNEXP_{Kj} = 4,00 + 0,70LNGDP_{Kj} - 0,82LNDIST_{Kj} - 0,08LNCOST_{impj} + \varepsilon \quad (13)$$

The most significant according to the p-value for the key variable ( $LNTIME_{expj}$ ) and the determination ratio was Model 2. Based on this specification, a new variable is introduced, which describes the change in the time spent on the customs procedure, both high-income and high-income exports are spent in Kazakhstan – the country of imports and export groups.

The model also confirmed the hypothesis that the time costs incurred by the high-income exporter of the group j countries, as well as similar costs in Kazakhstan, were inversely related.

Consider Model 2-5 for low-income and lower-middle-income countries, the results are presented in Table 4.

**Table 4. Results of low-income and lower-middle-income gravity Models 2-5**

Independent variable	Dependent variable $LNIMP_{Kj}$		Dependent variable $LNEXP_{Kj}$		
	Model 2	Model 3	Model 4	Model 5	
$LNGDP_{Kj}$	0,56 (0,378)*	-0,15 (0,243)*	0,62 (0,261)*	0,43 (0,419)*	
$LNDIST_{Kj}$	- 0,71 (0,471)*	0,19 (0,434)*	-2,30 (0,032)*	-2,07 (0,052)*	
$LNTIME_{expj}$	-2,39 (0,084)*				
$LNCOST_{impj}$				-1,77 (0,184)*	
$LNTIME_{impj}$			-1,30 (0,106)*		
$LNCOST_{expj}$		3,99 (0,000)*			
Constant	16,85 (0,135)*	-0,94 (0,696)*	20,68 (0,033)*	25,8 (0,042)*	
R <sup>2</sup>	0,45	0,97	0,42	0,51	
F-statistic		1,63	63,75	2,70	2,04
No of Obs.		10	10	10	10

\* p-value data are in brackets, 5% level value

This group of models showed the following results: the distance between countries when buying goods from low-income and lower-middle-income countries is not determinative. It should be noted that most of the countries in this group are slightly distant from Kazakhstan. Key variables of customs regulation were also not relevant. The composition of imports from the category of countries in question explains that the exporter's costs are not significant when importing: from low-income countries, Kazakhstan imports vegetables and fruits that are not available in the country, that is, goods with high demand (according to statistics). The export structure of Kazakhstan's goods is similar: animal and vegetable products and food.

Thus, the structure of trade may explain the low level of customs simplification in both the country of import and the country of export.

Model 3 showed not only inconsistency with the main patterns of gravity models for GDP variables and distance between countries, but also the absence of a previously identified pattern: The level of cost of customs clearance of exports does not affect the increase in the import of goods. In addition, the determination ratio of this Model 3 variant indicates that 97% of the model is driven by these variables. There may be barriers in low-income countries that are more significant than those discussed in Model 3. The multicollinearity test showed negative results, meaning the variables are not correlated. F-statistic rejects the null hypothesis of no meaningful relationship between independent and dependent variables.

The equation of this group:

$$LNIMP_{Kj} = 16,85 + 0,56LNGDP_{Kj} - 0,71\beta_2LNDIST_{Kj} - 2,39\beta_3LNTIME_{expj} + \varepsilon \quad (14)$$

$$LNIMP_{Kj} = -0,94 - 0,15LNGDP_{Kj} + 0,19\beta_2LNDIST_{Kj} + 3,99\beta_3LNCOST_{expj} + \varepsilon \quad (15)$$

$$LNEXP_{Kj} = 20,68 + 0,62LNGDP_{Kj} - 2,30LNDIST_{Kj} - 1,30\beta_3LNTIME_{impj} + \varepsilon \quad (16)$$

$$LNEXP_{Kj} = 25,8 + 0,43LNGDP_{Kj} - 2,07LNDIST_{Kj} - 1,77LNCOST_{impj} + \varepsilon \quad (17)$$

**Table 5. Results of gravity Models 2-5 with a group of countries with upper-average incomes**

Independent variable	Dependent variable $LNIMP_{Kj}$		Dependent variable $LNEXP_{Kj}$	
	Model 2	Model 3	Model 4	Model 5
$LNGDP_{Kj}$	0,59 (0,002)	0,61 (0,001)	-0,02 (0,885)	0,02 (0,890)
$LNDIST_{Kj}$	-0,31 (0,579)	-0,30 (0,583)	-1,88 (0,049)	-1,93 (0,039)
$LNTIME_{expj}$	-0,13 (0,521)			
$LNCOST_{impj}$				-1,18 (0,246)
$LNTIME_{impj}$			-0,26 (0,308)	
$LNCOST_{expj}$		-0,10 (0,469)		
Constant	0,73 (0,874)	0,46 (0,918)	22,19 (0,010)	21,75 (0,010)
R <sup>2</sup>	0,72	0,72	0,51	0,53
F-statistic	6,77	6,91	2,70	2,99
No of Obs.	12	12	12	12

\* p-value data are in brackets, 5% level value

The group models presented in Table 5 show that in upper-middle income countries, the time and cost of border formalities, most of which are customs formalities, are not significant (time and cost variables are not relevant).

It should be noted that Kazakhstan also belongs to this group of countries, which also influenced the results shown by the model: countries have an approximate level of development and almost all countries are parties to the RKC and the WTO Agreement on Trade Facilitation, which makes the facilitation of customs formalities a priority in the customs policy of these countries, that is, it can be concluded that the applicable customs regulations in the partner countries are similar. As a result of these circumstances, customs regulation is still relevant in trade with these countries, based on the findings of Model 1.

Models 2, 3 and 5 show the usual results relative to the GDP of countries and the distance between them. The exception is Model 4, which demonstrates the negative impact of the GDP of countries on export development, but the F-statistic for this model says that there is no significant link between the dependent and independent variables, However, the p-value of the GDP variable in question is not significant, so it is possible to exclude the value from the analysis by accepting the background of the key independent variable.

It should be noted that the time cost variable is most significant in the models presented. It can be assumed that time is the most sensitive factor when crossing the customs border, while transaction costs associated with border procedures are not the most important.

The equation for models presented in Table 6:

$$LNIMP_{Kj} = 0,73 + 0,59LNGDP_{Kj} - 0,31\beta_2LNDIST_{Kj} - 0,13\beta_3LNTIME_{expj} + \varepsilon \quad (18)$$

$$LNIMP_{Kj} = 0,46 + 0,61LNGDP_{Kj} - 0,30\beta_2LNDIST_{Kj} - 0,10\beta_3LNCOST_{expj} + \varepsilon \quad (19)$$

$$LNEXP_{Kj} = 22,19 - 0,021LNGDP_{Kj} - 1,88LNDIST_{Kj} - 0,26\beta_3LNTIME_{impj} + \varepsilon \quad (20)$$

$$LNEXP_{Kj} = 21,75 + 0,2LNGDP_{Kj} - 1,93LNDIST_{Kj} - 1,18LNCOST_{impj} + \varepsilon \quad (21)$$

## 5. Conclusion

Currently, large-scale work is being carried out in the Republic of Kazakhstan to simplify trade procedures, which is based primarily on the reform of customs procedures. The priority of customs regulation is an electronic declaration, an important part of that is customs risk management.

The purpose of this study is to determine, based on gravity models, the role of the customs regulation factor in the development of bilateral trade between Kazakhstan and the countries with the closest trade relations. At the same time, in order to obtain a more complete analysis, Kazakhstan's partner countries are divided into three groups depending on their income level. A model based on the simultaneous participation of countries in the RKC. Such a model is necessary to answer the question of whether similarity in customs procedures is a positive factor for the development of bilateral trade between countries.

The factor of customs regulation of foreign trade in this paper is determined by the World Bank data on the time and cost incurred by importers and exporters for crossing the customs border.

The application of the gravity model in this article was aimed at obtaining conclusions on the role of customs regulation in the development of exports and imports, which is justified by the need to apply a differentiated approach to the implementation of the foreign trade policy of the country. This paper is based on trade data from Kazakhstan with a group of selected countries, but the findings can be extrapolated to other small open economies as well as international trade studies. The conclusions of the study could serve as an evidence base for the development of an effective trade capacity-building strategy for Kazakhstan and other countries with similar indicators.

The assessment of the impact of customs regulation on the development of Kazakhstan's foreign trade showed diverse results depending on the specifications of the models, which were designed to consider the differences in the size of the economies of the countries, participating in bilateral trade with Kazakhstan. The use of the proposed approach to modelling and design gives the government and business more information on which combinations of terms of trade can provide positive changes related to the growth of exports and imports.

One model confirmed earlier research findings that participation in the RKC led to increased bilateral trade. This fact should be considered in the formulation of the trade and customs policy of States, developing instruments of customs regulation based on the fundamental principles of simplification of customs procedures laid down in this international agreement.

An analysis of Kazakhstan's exports and imports with high-income countries concluded that Kazakhstan's imports were adversely affected by export delays from partner countries. Given that most of the countries in this grouping do not have the cost of customs clearance of exports and imports, the models have shown that these variables are not significant, but still revealed the negative dependence of such variables on Kazakhstan's exports and imports. Another model in this group, however, showed that the time spent on exports in the country of departure and the same delays in clearing customs in the country of destination could negatively affect Kazakhstan's imports.

Considering the structure of Kazakhstan's imports and exports to low-income and lower-middle-income countries, the model, with the expected outcome relative to GDP and the distance between countries, showed that key variables were not relevant. Perhaps, in order to get clearer conclusions, it is necessary to take as a basis the export and import that are not essential goods. There are, however, a number of economic problems in low-income countries that are of higher priority than the factors addressed.

A third category of middle-income countries confirmed the finding that the harmonization of customs procedures aimed at simplification in partner countries had a positive impact on the development of both exports and imports of goods.

Summarizing the above observations, it can be noted that the time spent at the border in customs clearing goods plays a bigger role than the financial costs of exporters and importers.

At the same time, improved customs procedures can facilitate trade and contribute to the growth of a State's foreign trade.

Thus, the assessment of the impact of customs regulations provides for trade policy policymakers information on the nature of trade relations with countries of different income levels and also confirms the need for customs regulatory reforms, which will eventually lead to the development of trade as a fundamental factor of economic well-being for Kazakhstan's economy.

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