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The Effect of Trade Costs on the Foreign Trade Size: A Comparative Study of High-Income Countries and Upper-Middle-Income Countries

Ticaret Maliyetlerinin Dış Ticaret Hacmine Etkisi: Yüksek ve Üst-Orta Gelirli Ülkeler Üzerine Bir Çalışma

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ABSTRACT

In theories of microeconomics, exchange costs are not taken into account when discussing exchange benefits, and an implicit assumption is made that exchange costs are zero. On the other hand, in the traditional international economy, the cost of trade was not considered very carefully. However, in the modern economy, trade costs constitute a significant portion of global trade. This article examined the effect of trade costs on trade volume in two groups, high-income, and upper-middle-income countries, over the period of 2006-2015 using the Panel data analysis method. The results of the study show that transportation costs and the number of commercial documents have a negative effect on the trade volume in high-income countries. In high-income countries, trade costs lead to a decrease in trade volume, while in upper-middle-income countries, transportation costs and the number of trade documents do not have a significant impact on trade volume.

Keywords: Documents in international trade, export and import, high-income countries, middle-high-income countries, trade cost, transportation cost

ÖZ

Geleneksel dış ticaret teorisi uluslararası ticarette taşıma maliyetlerinin sıfır olduğunu iddia etse de gerçek yaşamda taşıma maliyetleri işlem maliyetlerinin önemli bir kısmını oluşturur. Bu çalışmada 2006–2015 döneminde yüksek gelirli ülkeler ve üst orta gelirli ülkeler olmak üzere iki grupta ticaret maliyetlerinin ticaret hacmi üzerindeki etkisini Panel veri analizi yöntemini kullanarak incelenmektedir. Çalışmanın sonuçları, yüksek gelirli ülkelerde taşıma maliyetlerinin ve ticari belge sayısının ticaret hacmi üzerinde olumsuz etkiye sahip olduğunu göstermektedir. Dolayısıyla sonuçlar, yüksek gelirli ülkelerde ticaret maliyetlerinin ticaret hacminde azalmaya yol açtığını, üst orta gelirli ülkelerde ise taşıma maliyetlerinin ve ticari belgesi sayısının ticaret hacmi üzerinde önemli bir etkisinin olmadığını göstermektedir.

Anahtar Kelimeler: Ticaret maliyeti, ulaştırma maliyeti, ihracat ve ithalat, uluslararası ticarette belgeler, yüksek gelirli ülkeler, orta-yüksek gelirli ülkeler

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Introduction

Countries around the world seek to investigate and identify the factors affecting exports and imports so that they can adopt appropriate economic policies (Fatali, 1997, p. 9). Therefore, this article examines the effect of trade costs, which play an important role in international trade and the competitiveness of countries in global trade. In international trade, costs include production costs and trade costs. Production costs are related to the structure and economic conditions of the production sector of exporting or importing countries. However, trade costs are related to non-production costs and depend on both exporting and importing countries, which can be referred to as the transportation cost or trade barriers such as tariffs and administrative costs of export and import (Anderson & Van Wincoop, 2004, p. 694-695).

The question is that "do trade costs in groups of countries with different income levels have a similar effect on their trade value?" Therefore, the main question of the present article is about the effect of trade costs on the trade value in the group of high-income countries and upper-middle-income countries. It is expected that the income level of countries can influence the effect of trade costs on their trade value. Therefore, in this study, the effect of trade costs on trade value during the period 2006–2015 is discussed using panel data analysis.

The rest of this study is organized as follows: The theoretical foundations and research background are discussed in the second section, the methodology and introduction of the research method in the third, the analysis of research data and findings in the fourth, and in the final section, summation, conclusion and policy suggestions are presented.

Theoretical Literature and Literature Review

International trade is affected by many variables such as economic growth, exchange rates, exchange rate fluctuations, monetary and fiscal policies of countries, and the economy's openness degree. However, in addition to these variables, certainly in the discussion of international trade, one of the reasons for the increase in trade is the trade cost. Among these costs, we can mention transportation costs, reduction of trade tariffs between exporting and importing countries, and the time required for exports and imports (Anderson & Van Wincoop, 2004, p. 698).

Factors Affecting International Trade

The volume of trade or the summation of exports and imports is affected by several economic variables, some of which are described in this section. Among the variables examined, we can refer to trade costs, exchange rates, economic growth, and the degree of economy's openness (Ahmadishadmehri & Ahmadianyazdi, 2012, p. 118).

Trade Cost and International Trade

Trade costs include all costs required to deliver the product to the final consumer and of course, do not include the production costs. These costs include transportation costs (including transportation costs and time costs), policy barriers (including tariff and non-tariff barriers), information costs, contract execution costs, costs associated with using different currencies, legal and regulatory costs, and regional distribution costs (intentional sales and retail) (Anderson & Wincoop, 2004, p. 700-701).

Trade costs are also defined (Ahmad & Hina, 2019) as the difference between the final cost of production in one country and the price paid by consumers in another. These costs can be divided into two parts: trade costs in the country of origin and trade costs in the importing country (Ahmad & Hina, 2019, p. 73).

Exchange Rates and International Trade

According to the international trade foundations, one of the moderating exchange rate policies is the policy of devaluing the national currency (increasing the real exchange rate). Based on economic theories with the implementation of this policy, the value of the country's exports increases and the value of imports decreases. Thus, the consequence of these two effects leads to improving the country's balance of trade. Accordingly, it is expected to be a direct relationship between changes in a country's exchange rate and balance of trade (Ahmadishadmehri & Ahmadianyazdi, 2012, p. 119).

Economic Growth and International Trade

Two functions of import demand and export supply are used to discuss the effect of economic growth on trade. Exports are one of the main pillars of international trade. Classical and neoclassical theories of growth have emphasized the relationship between increased exports and economic growth, and it is believed that the development of the international economy has led to increased expertise and efficiency in the export sector. Finally, it redistributes resources from non-commercial and inefficient sectors to commercial sectors and can help to increase production (Lam, 2015, p. 608).

As gross domestic product (GDP) grows, the demand for goods and in-demand services is met, and the export of excess domestic demand becomes possible.

The Degree of Economy's Openness and International Trade

The degree of economy's openness or economic liberalization means reducing trade restrictions and tariffs, which reduces trade barriers for countries; in this way, their foreign trade increases. In other words, increasing foreign trade means increasing the countries' exports and imports and bringing significant benefits to countries on the path of economic growth and development. Therefore, according to the aforementioned, the higher the economy's openness degree (the ratio of total exports and imports to GDP), the more open that economy is in international trade. Thus, trade exchanges are more important and account for a larger share of GDP (Rodrik, 1997, p. 3-5).

Literature Review

Sugiharti et al. (2020) presented a study using the Autoregressive Distributed Lag (ARDL) model during the monthly period 2006–2018. The results of their study showed that the effect of the exchange rate on many export goods from Indonesia to India, Japan, South Korea, and the United States has been significant both in the short and long term, and this relationship has been negative for most export goods from China.

Vieira and MacDonald (2020) examined the effect of exchange rates on the current accounts of 58 selected countries during the period 1994–2014. The results of their study showed that the current account has deteriorated, and in countries where the exchange rate has risen, the current account has improved.

Xu et al. (2020) examined the effect of tariffs on Chinese export destinations using the panel data method. Their study period was 2002–2013. The results of their study showed that tariffs have a negative effect on exports at the national level and exports at the level of enterprises.

Ahmad and Hina (2019) examined the effect of trade cost, in particular, tariffs on the volume of trade (exports) of Pakistan with its trading partners during the period 2005–2017. For this purpose, they used the panel data method. The results of their study showed that population, GDP, and tariffs have a direct effect on Pakistan's exports to its trading partners. The results also showed that the exchange rate and the distance between the countries have a negative effect on Pakistan's exports to its trading partners.

Cam Tu and Giang (2018) examined the effect of trade costs on exports in Vietnam. They used the panel data method of the gravity model in their study during the period 2001–2013. The results obtained from their study by fixed effect methods showed that trade costs play a crucial role in Vietnam's trade with its trading partners. The results also showed that the population of importing countries, the degree of economy's openness in importing countries, the GDP of the importing country, and the GDP of Vietnam have a significant effect on bilateral exports with its trading partners.

Wangpit (2013) examined the effect of export facilitators and distance on Thailand's exports to Singapore and the European Union using panel data method during the period 1999–2010. The results of his study showed that the commercial cost of industrial goods in Thailand has decreased over time because of reducing tariffs and also the distance between Thailand and the EU accounts for a significant share of business costs.

Methods

The present study in terms of purpose is an applied research and in terms of research method is correlation analysis. The statistical population used in this study includes 30 high-income countries and 31 upper-middle-income countries (see Appendix A for the list of countries).

Empirical Model Specification and Econometric Model

The model is specified as follows:

$$Trade_{it} = \alpha_0 + \alpha_1 TC_{it} + \alpha_2 TT_{it} + \alpha_3 DT_{it} + \alpha_4 GDP_{it} + \alpha_5 EXC_{it} + \alpha_6 OP_{it} + \alpha_7 Tarrif_{it} + \varepsilon_{it}$$

- Trade value: it refers to the total exports and imports of countries, and the required statistics and information have been collected from the World Development Indicators (WDI) (2019) World Database. The figures for this variable are in million dollars.
- Transportation cost: The total cost of relocation of export and import containers is in dollars and its statistics and information are collected from the statistical database of the Global Business Group.
- Export and import time: the total duration of exports and imports is given in days and its statistics and information are collected from the statistical database of the World Business Group.
- Documents of trading: it is the total of registered documents for export and import (document), and its statistics and information have been collected from the statistical database of the World Business Group.
- Gross domestic product: it is the monetary value of all goods and services produced per year in a country, and in fact, it will be compared to the base year of 2010. Gross domestic product statistics and data are also collected from the WDI (2019) Global Database. The figures for this variable are in million dollars.
- Exchange rate: it indicates the value of the national currency against the US dollar; GDP statistics and data are also collected from the WDI (2019) World Database.
- Trade openness: it is equal to the ratio of total exports and imports to GDP (percentage of GDP), and its statistics and data are also collected from the WDI (2019) World Database.
- Tariff: the cost of export and import tariff is in dollars, and its statistics and data are also collected from the WDI (2019) World Database.

Trend of Research Variables

In the present section, we examine the average trend of indicators during the period 2006–2015 in a group of high-income countries and upper-middle-income countries.

The Average Trend of Trade Value in the Studied Countries

The average trend of trade value in both groups of studied countries during the period 2006–2015 is shown in Figure 1.

As shown in Figure 1, the trend of trade value in the group of studied countries is increasing during the period under consideration. Also, high-income countries have the highest volume of trade compared to the other group. In fact, as income levels increase in the studied countries, trade value also increases.

The Average Trend of Transportation Costs in the Studied Countries

The average trend of transportation cost in both groups of studied countries during the period 2006–2015 is shown in Figure 2. As shown in Figure 2, high-income countries have the lowest transportation costs compared to upper-middle-income countries.

The Average Trend of Export and Import Time in the Studied Countries

The average trend of export and import time (number of export and import days) in the studied countries during the period 2006–2015 is shown in Figure 3.

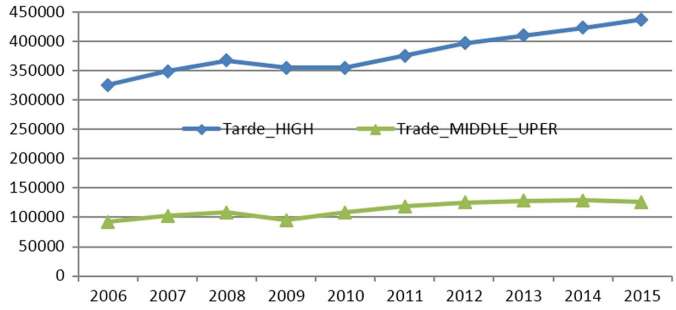


Figure 1.
Average Trend of Trade Value in the Group of Studied Countries During the Period 2006–2015. Source: Research Calculations and WDI (2019).

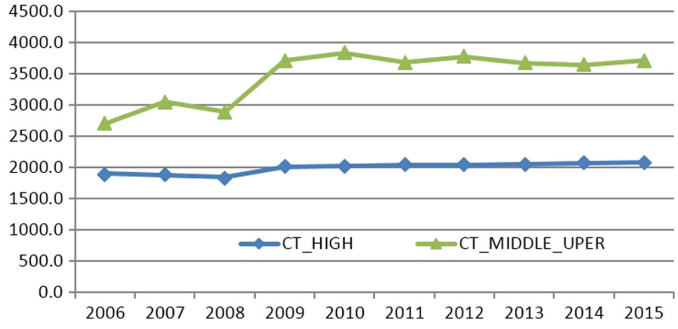


Figure 2.
Average Trend of Transportation Costs in the Group of Studied Countries During the Period 2006–2015. Source: Research Calculations and WDI (2019).

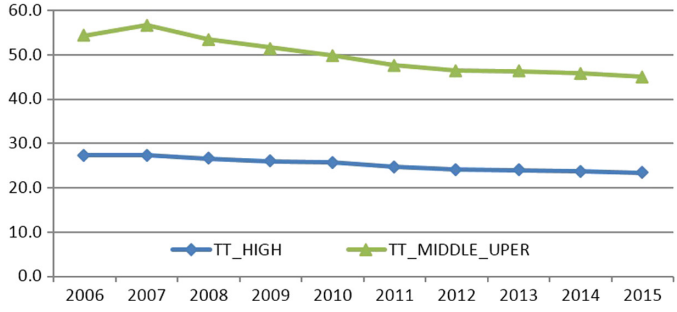


Figure 3.
The Average Trend of Export and Import Time in the Studied Countries During the Period 2006–2015. Source: Research Calculations and WDI (2019).

As shown in Figure 3, the average trend of export and import days in the group of countries with high-income levels is the number of days of exports and imports is the lowest (under 30 days) and countries with average income levels are in the range of 45 and 60 days. Thus, an increase in the income level of the countries has led to a decrease in the days of exports and imports.

The Average Trend of Documents of Trading in the Studied Countries

The average trend of documents of trading in the studied countries in both groups of studied countries during the period 2006–2015 is shown in Figure 4.

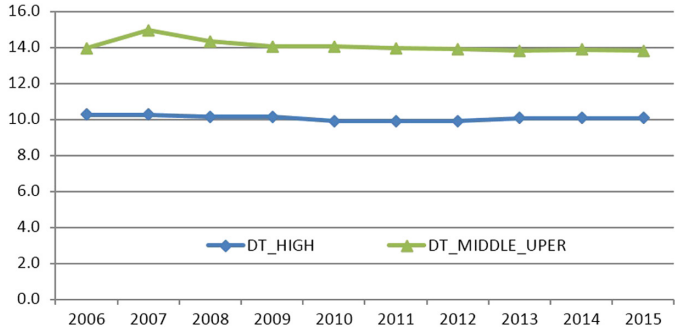


Figure 4.
The Average Trend of Documents of Trading in Group of Studied Countries During the Period 2006–2016. Source: Research Calculations and WDI (2019).

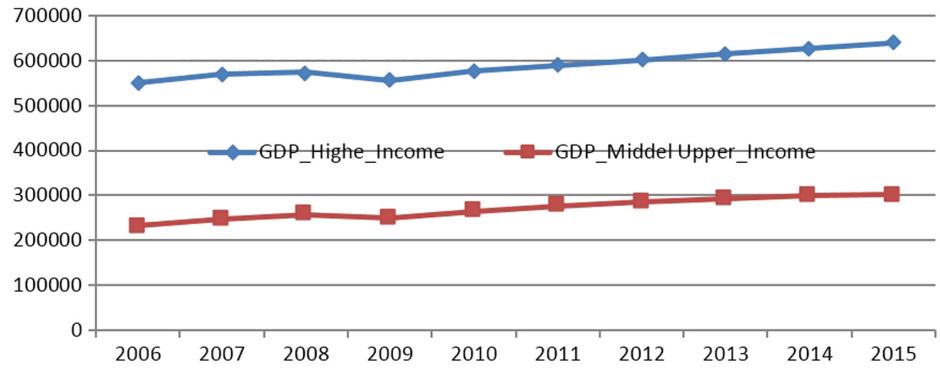


Figure 5.
Average Trend of Documents of GDP (billion dollars) in the Group of Studied Countries During the Period 2006–2015. Source: Research Calculations and WDI (2019). Note: GDP = gross domestic product.

As shown in Figure 4, the trend of the number of documents of trading in the group of high-income countries is the least number (10 documents) and in upper-middle-income countries is between 14 and 15 documents. Therefore, as countries' incomes increase, the number of documents of trading will decrease.

The Average Trend of Documents of* Gross Domestic Product *in the Studied Countries

The average trend of trade value in the studied countries during the period 2006–2015 is shown in Figure 5.

As shown in Figure 5, the average trend of real GDP has an upward trend in the group of studied countries. There is also a significant difference between the real GDP in the group of studied countries.

Average Trend of Exchange Rate in the Studied Countries

The average trend of exchange rates in the studied countries during the period 2006–2015 is shown in Figure 6.

As shown in Figure 6, the average trend of exchange rates in the group of high-income countries is lower than in upper-middle-income countries.

Average Trend of Economy's Openness Degree in the Studied Countries

Average trend of economy's openness degree in two groups of studied countries during the period 2006–2015 is shown in Figure 7.

As shown in Figure 7, the average trend of economy's openness degree in high-income countries is the highest and in upper-middle-income countries is less than in high-income countries.

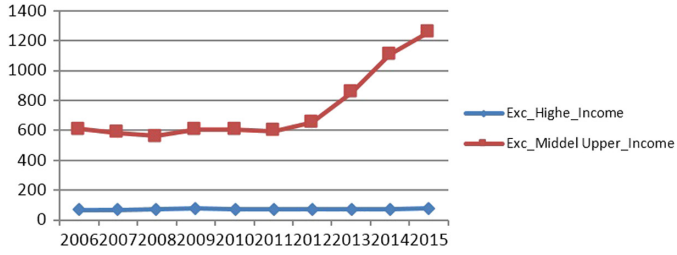


Figure 6.
The Average Trend of Exchange Rates in the Group of Studied Countries During the Period 2006–2015. Source: Research Calculations and WDI (2019).

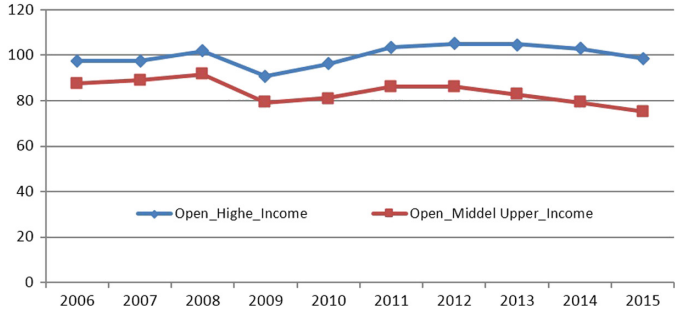


Figure 7.
The Average Trend of Economy's Openness Degree in two Groups of Studied Countries During the Period 2006–2015. Source: Research Calculations and WDI (2019).

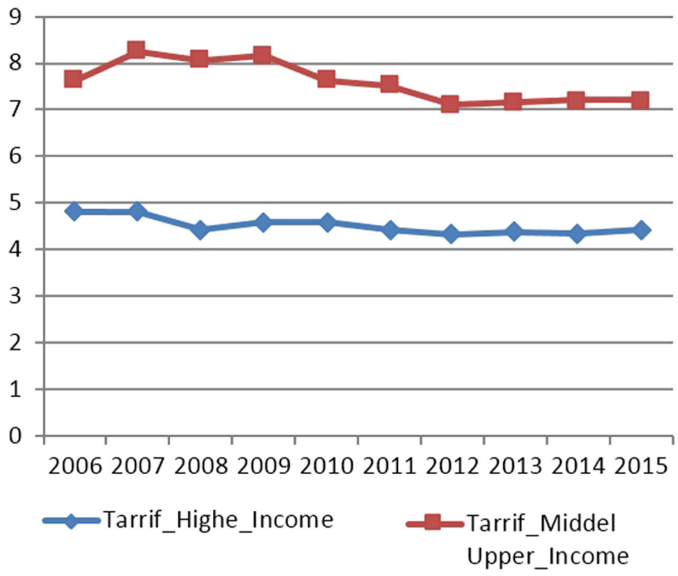


Figure 8.
The Average Trend of Tariff Costs in the Group of Studied Countries During the Period 2006–2015. Source: Research Calculations and WDI (2019).

The Average Trend of Tariff Cost in Studied Countries

The average trend of tariff costs in the two groups of studied countries during the period 2006–2015 is shown in Figure 8.

As shown in Figure 8, the average trend of tariff costs in high-income countries is the less than upper-middle-income countries.

Empirical Findings of Model Estimation

In this section, first, we examine the reliability test of the article variables, and then, the model is estimated. The estimates have been done using Eviews software version 11.

The Reliability Test of Model Variables in High-Income and Upper-Middle-Income Countries

The reliability test of the model variables is presented in Table 1.

Results obtained from reliability test of the model variables in Table 1 show that probability value of Levin, Lin, and Chu test statistics for variables of trade volume, transportation cost, export and import time, GDP, exchange rate, tariff rate and economy's openness degree, and documents of trading in the studied countries is less than five hundredths; and this result indicates that the null hypothesis based on having a unit root of variables is rejected and its opposite hypothesis that is the reliability of the variables is accepted.

Results for Diagnostic Tests for High-Income Countries Model

The F-Limer test statistical probability value is less than 1% in the model of high-income and upper-middle-income countries. Therefore, at a 99% confidence level, the calculated F statistic based on group estimation method indicates the rejection of the null hypothesis, or the opposite hypothesis acceptance based on the data panel, the estimation method in this group of countries are presented in Table 2.

Hausman Test Results for the Model of High-Income Countries and Upper-Middle-Income Countries

Probability value of Hausman test statistics for the model of high-income countries and upper-middle-income countries is zero, which is less than the significance level of 1%. Therefore, the null hypothesis that indicates compatibility of estimates with random effects is rejected as opposed to the hypothesis that the estimation is consistent with the fixed effects. The result are shown in Table 3.

Table 1.
Results for Panel Unit Root Tests, the Model Variables for High-Income Countries, and Upper-Middle-Income Countries Using (Levin-Lin-Chu) LLC Test

			High-Income Countries		Upper-Middle-Income Countries	
Variable	Abbreviation	Test Conditions	Test Statistics	Probability	Test Statistics	Probability
Trade value	Trade	With intercept and trend	−15.32	.0000	−7.66	.0000
Transportation cost	TC	With intercept and trend	−10.57	.0000	−15.76	.0000
Export and import time	TT	With intercept and trend	−4.60	.0000	−41.32	.0000
Documents of trading	DT	With intercept and trend	−1.88	.0299	−20.42	.0000
GDP	GDP	With intercept and trend	−9.94	.0000	−7.61	.0000
Exchange rate	EXC	With intercept and trend	−4.32	.0000	−21.84	.0000
Tariffs	Tariffs	With intercept and trend	−5.18	.0000	−15.53	.0000
Economy's openness degree	OP	With intercept and trend	−9.28	.0000	−17.74	.0000

Source: Research Calculations.

Table 2.
Model F-Limer Test Results for High-Income Countries Model and Upper-Middle-Income Countries

	High-Income Countries		Upper-Middle-Income Countries	
Test	Statistics	Probability Value	Statistics	Probability Value
F Limer	234	.0000	239	.0000
Chi square	975	.0000	946	.0000

Source: Research Calculations

Table 3.
Hausman Test Results for the Model of High-Income Countries and Upper-Middle-Income Countries

	High-Income Countries		Upper-Middle-Income Countries	
Test	**Test Statistics**	**Probability Value**	**Test Statistics**	**Probability Value**
Hausman	162	.0000	34.27	.0000

Source: Research Calculations

Table 4.
Kao Co-Integration Results for the Model of High-Income Countries and Upper-Middle-Income Countries

	High-Income Countries		Upper-Middle-Income Countries	
Test	**Test Statistics**	**Probability Value**	**Test Statistics**	**Probability Value**
Kao co-integration test	−6.19	.0000	−3.07	.0011

Source: Research Calculations

Kao Co-Integration Results for the Model of High-Income Countries and Upper-Middle-Income Countries

Kao co-integration test is used to examine the variable co-integration; and the Kao co-integration results for the model of high-income countries and upper-middle-income countries are shown in Table 4.

The probability value of the Kao test statistic is less than one hundredth. The null hypothesis of this test that there is no coherence between the variables is rejected, and the opposite hypothesis that there is a combination of variables is accepted. Therefore, there is a co-integration between the model variables of high-income countries and upper-middle-income countries, and a long-term relationship is established.

Results Obtained from the Estimates for Model of High-Income Countries and Upper-Middle-Income Countries

According to the results obtained from F-Limer and Hausman tests, the results of the model estimated with fixed effects in high-income, and upper-middle-income countries during the period 2006–2015 are shown in Table 5.

Results obtained from model estimation based on the effect of trade cost on trade volume in high-income and upper-middle-income countries in Table 5 can be discussed as follows.

Transportation costs in high-income countries with a coefficient of −2.9 have a significant negative effect on the trade volume at a significant level of 5%. Thus, with a 1-unit increase in transportation costs in high-income countries, trade volume will decrease by 2.9 units and in upper-middle-income countries, with a coefficient of −0.17, it has a negative effect on trade volume which is not statistically significant.

Export and import time with a coefficient of 102.6 does not have a significant effect on trade volume in high-income countries. But with a coefficient of 68.82, it has a direct and significant effect on the trade volume in upper-middle and high-income countries. In other words, in these countries, the increase in the number of export and import days has led to an increase in trade volume.

Real GDP by a coefficient of 0.84 has a direct and significant effect on the trade volume in high-income countries at a significant level of 1%. It means that by increasing 1 unit in real GDP in high-income countries, trade volume increases by 0.84 units. Also, real GDP with

Table 5.
Results Obtained From the Estimates for Model of High-Income Countries and Upper-Middle-Income Countries (Dependent Variable: Trade Volume)

		High-Income Countries			Upper-Middle-Income Countries		
Variable	**Abbreviation**	**Coefficient**	**T Statistics**	**Probability**	**Coefficient**	**T Statistics**	**Probability**
Intercept	C	19340.2	.51	.6040	785.7	.09	.9240
Transportation cost	TC	−2.9	−2.49	.0131	−0.17	−.59	.5491
Export and import time	TT	102.6	.93	.3504	68.82	2.93	.0036
Documents of trading	DT	−16392.7	−4.71	.0000	−91.72	−.86	.3880
GDP	GDP	0.84	30.1	.0000	0.43	16.46	.0000
Exchange rate	EXC	−58.7	−3.45	.0006	−9.64	−4.11	.0001
Economy'sopennessdegree	OP	236.5	5.89	.0000	62.59	10.16	.0000
Tariff	Tariff	−74.9	−.24	.8072	−878.13	−6.64	.0000
R^2	0.99	Statistics F		3513	0.99	Statistics F	2353
R^2 adjusted	0.99	Statistical probability F		.0000	0.99	Statistical Probability F	.0000
Number of countries	30	Observation number		295	29	Observation Number	284

Source: Research Calculations

a coefficient of 0.43 has a direct and significant effect on the trade level in upper-middle-income countries with a significant level of 1%. It means that by increasing 1 unit in real GDP in upper-middle and high-income countries, trade volume increases by 0.43 units.

Exchange rates in high-income countries with a coefficient of −58.7 have a negative and significant effect on the trade volume at a significant level of 1%. It means that by increasing 1 unit in exchange rates of these countries, trade volume decreases significantly by 58.7 units. Also, exchange rates in upper-middle-income countries with a coefficient of −9.64 have a negative and significant effect on the trade volume at a significant level of 1%. It means that by increasing 1 unit in exchange rates of these countries, trade volume decreases significantly by 9.64 units.

The economy's openness degree in high-income countries with a coefficient of 226.5 has a direct and significant effect on the trade volume at the significant level of 1%. Therefore, by increasing 1 unit in economy's openness degree of these countries, trade volume increases significantly by 226.5 units. Also, the economy's openness degree in upper-middle-income countries with a coefficient of 62.59 has a direct and significant effect on the trade volume at the significance level of 1%. Therefore, by increasing 1 unit in economy's openness degree of these countries, trade volume increases significantly by 62.59 units.

Tariff with a coefficient of −74.9 has a negative effect on trade volume in high-income countries, which is not statistically significant. Also, tariff with coefficient of −878.13 has a direct and significant effect on the trade volume in upper-middle-income countries at the significant level of 1%. Therefore, with a 1-unit increase in tariffs in upper-middle- and high-income countries, trade volume decreases significantly by 62.59 units.

The number of trading documents with a coefficient of −16392.7 has a significant negative effect on trade volume in high-income countries, which is not statistically significant. Therefore, with a 1-unit increase in documents of trading in these countries, trade volume decreases significantly by 16392.7 units. Also, the number of trading documents with a coefficient of −91.7, has a significant negative effect on trade volume in upper-middle-income countries at the significant level of 1%. Therefore, by increasing 1 unit in number of trading documents in these countries, trade volume decreases significantly by 91.7 units.

Finding Analysis

Transportation costs in high-income countries have a significant negative effect on trade volume. According to the results obtained by estimating the models, it is observed that transportation costs in high-income countries are higher than upper-middle-income countries.

The duration of exports and imports in high-income countries does not have a significant effect on trade volume.

The number of documents in the group of high-income countries and upper-middle-income countries significantly reduces the trade volume and its impact is higher in high-income countries than in other countries.

Real GDP in both high-income countries and upper-middle-income countries has a direct and significant effect on trade volume.

Exchange rates in the group of high-income countries and upper-middle-income countries have a negative impact on trade volume.

The economy's openness degree in both groups of countries has a direct impact on trade volume. In other words, in each group of the country with different income levels, the economy's openness degree increases with the trade volume.

Tariffs in upper-middle-income countries have a negative impact on trade volume. But, in high-income countries, it has no significant effect on the trade volume of these countries.

Conclusion and Policy Suggestions

In international trade, costs include production costs and trade costs. Production costs are related to the structure and economic conditions of the production sector of exporting or importing countries, while trade costs are related to non-production costs and depend on both exporting and importing countries, which include transportation costs or trade barriers such as tariffs and administrative costs of exporting and importing.

As exports increase the total demand level and increase the economic activity volume in the exporting country, it can lead to production in countries. Also, increasing the import of goods, especially intermediates and raw materials, will increase the mobility of the domestic economy of the importing country and will have a direct impact on production and economic growth. Accordingly, countries want to remove obstacles and problems related to exports and imports to take advantage of exports and imports in order to improve the internal conditions of their economies. One of the biggest obstacles in international trade is related to trade costs. This, in turn, requires the study of the trade costs' impact on trade value. But the question is, Do trade costs in groups of countries with different income levels have a similar effect on their trade value? Therefore, the main question of the present study is related to the trade cost impact on trade value in a group of countries with different income levels. Accordingly, countries were selected based on the division into groups of high-income countries and upper-middle-income countries, and the effect of trade costs on their trade value was examined. In fact, it is expected that the income level of countries can influence the impact of trade costs on the trade value in these countries.

The results and findings of this study are given as follows: transportation costs in high-income countries with a coefficient of −2.9 have a negative and significant effect on trade volume at the significant level of 5%. Therefore, by increasing 1 unit in transportation costs in these countries, trade volume decreases significantly by 2.9 units. Also, the transportation costs in upper-middle-income countries with a coefficient of −0.17 have a negative impact on trade volume where its effect is not statistically significant.

The expansion and prosperity of international trade, and the success in globalization process in developed and developing countries, are not possible without addressing the international trade costs. Because, one of the solutions to succeed and improve the competitiveness of developed and developing countries in the field of international trade is to discuss international trade costs such as transportation costs, tariff costs, and bureaucracy costs. Trade costs include political barriers (tariff and non-tariff), transportation costs (transportation costs and time), communication and information costs, executive costs, currency, legal, regulatory costs, and local distribution costs.

According to the results, it has been observed that transportation costs in both groups of countries with different income levels have a negative and significant effect on trade volume. Therefore, it is considered that transportation is one of the most important indicators of international trade. Therefore, countries are required to make appropriate and efficient policies to reduce transportation costs. Among these policies, we can refer to the formation of international transport union, the development of rail and sea transport, and the reduction of tariffs in the transport sector. Export time also has a negative impact on trade volume; therefore, countries must take some action such as reducing administrative bureaucracies and creation of electronic infrastructure for the export and import process in order to reduce trade costs.

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APPENDIX A

Research Countries

A) The list of high-income countries used in the statistical sample is as follows:

Argentina, Australia, Bahamas, Bahrain, Brunei, Canada, Chile, Croatia, Czech, Denmark, Hungary, Iceland, Israel, Japan, Korea, Kuwait, Latvia, Lithuania, New Zealand, Norway, Oman, Poland, Qatar, Saudi Arabia, Singapore, Sweden, Switzerland, United Arab Emirates, United Kingdom, Uruguay.

A) The list of upper-middle-income countries used in the statistical sample is as follows:

Albania, Algeria, Angola, Azerbaijan, Belarus, Belize, Bosnia, Botswana, Brazil, Bulgaria, Colombia, Costa Rica, Dominican, Ecuador, Gabon, Guyana, Jordan, Kazakhstan, Malaysia, Mauritania, Mexico, Montenegro, Namibia, Panama, Paraguay, Peru, Romania, Russian, Turkey, Venezuela, Iran