

## Article

# Impact of Trade Facilitation on Trade of Post-socialist Countries in Europe and Central Asia

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## Abstract

Trade facilitation is implemented to enhance international trade smoothly. Well-organized trade facilitation is indispensable in developing countries, especially in transition economies. Hence, trade facilitation performance is an important part of trade policy. This paper investigates the impact of trade facilitation on the export and import of 21 former socialist countries with a gravity model. The exports and imports data for the analysis consist of 10 major trade partner countries and the sample period, which is confined by the availability of trade facilitation indicators from OECD, is three years (2017, 2019, and 2022). The estimated results considering country-specific effects show that while the coefficients of distance, GDP of targeted countries, and GDP of partner countries are significant with an expected sign, the coefficient of average trade facilitation index (TFI) is positive but insignificant. TFI is a composite index which consists of 11 components. The country-specific regression results of each component as an explanatory variable instead of average TFI show that information availability, advance rulings, automation, procedures, and internal border agency co-operation have impacts on trade significantly.

**Keywords:** Trade facilitation, transition economies, institutional elements, gravity model

## 1. Introduction

Trade facilitation is implemented to enhance international trade smoothly. The role of trade facilitation in trade activity is acknowledged by economists and policymakers. There are many empirical studies that stress the importance of trade facilitation efforts for increasing trade between countries (Wilson et al., 2003; Wilson et al., 2005; Shepherd & Wilson, 2009; Portugal-Perez & Wilson, 2012; Djankov et al., 2010).

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Recognizing this effect of trade facilitation, international experts and national policymakers relatively quickly find consensus in multilateral trade negotiations. Indeed, the Trade Facilitation Agreement (TFA) was the first multilateral trade agreement concluded by member countries in the World Trade Organization's nearly twenty-year history, including twelve years of Doha Round negotiations (Czapnik, 2015). According to the World Trade Organization (2023), this agreement increased trade by USD 321 billion or by 1.17% for the first two years of its implementation, i.e., in 2017-2019. After five years of its entry into force, TFA reduced trade costs by 1-4% on average (Duval & Utoktham, 2022). Thus, trade facilitation is an important part of trade policy.

Well-organized trade facilitation is indispensable in developing countries, especially in transition economies. After the collapse of the Soviet Union in 1991 most of the former socialist countries started to open their countries with lowering import taxes, abolition of import restrictions, etc.

Kanybekov (2023) examines the progress of trade facilitation of 21 post-socialist countries using the OECD Trade Facilitation Index during 2017-2022 and finds that their achievements differ by country. When these countries are categorized into three areas, Eastern Europe and Baltic countries, Commonwealth of Independent States (CIS), and Central Asia, Eastern Europe and Baltic countries area records the highest score, followed by CIS, and Central Asia. In the case of the Kyrgyz Republic, while its average score is almost the same as the average of Central Asia, and its component "documents" shows a significantly increased score, "Internal border agency co-operation" scores remain stagnant (Kanybekov & Inaba, 2023).

Most empirical studies estimate the impacts of trade facilitation on trade by considering all countries in the world, particular regions (ex., Balkan countries of Europe, Central Asia), areas of economic integration (ex., APEC, ASEAN, EU), or specific economies. Usually, the model is a gravity model and different variables are used as a proxy for trade facilitation. These variables are trading across borders, logistics performance index provided by the World Bank, OECD's Trade Facilitation Indicators (TFIs), etc. The estimated results show that these indicators positively affect trade flows.

While many studies show how changes in trade facilitation indicators resulted in the trade volume in different regions and countries, a few studies focus on transition economies. Hence, it is important to examine the impact of the trade facilitation of post-socialist countries on their trade. In addition, focusing on the effect of specific trade facilitation components on trade volume can reveal which aspects of trade facilitation are more significant.

The purpose of this study is to investigate the impacts of the trade facilitation performance of post-socialist countries of Europe and Central Asia on their trade volume. Specifically, the study tests the relationship between scores in TFIs and trade volume (exports and imports) using the gravity model. This study examines how changes in trade facilita-

tion performance affect trade flows. Such analysis can provide additional insights into the discussion on trade facilitation in transition economies of Europe and Central Asia.

The organization of this study is as follows. Section 2 is a literature review. Section 3 explains the methodology and the data for the analysis, followed by discussions on the estimated results in Section 4. Section 5 is a conclusion.

## 2. Literature review

This section focuses on the empirical studies regarding the impacts of trade facilitation on trade. Most studies use a gravity model and examine different categories of countries. Also, some studies apply TFIs as a proxy variable for trade facilitation. The followings are the empirical studies on the impacts of trade facilitation by area and country.

### 2.1 Empirical studies in Central Asia, Central and East Europe

Felipe & Kumar (2012) examine the effect of trade facilitation measures on trade volume in Central Asia. They assess the impact of trade facilitation on bilateral trade flows and find that improving trade facilitation increases trade volume. Karymshakov & Sulaimanova (2023) investigate the effect of infrastructure and trade facilitation on the trade of five Central Asian nations in 2010–2020, participants of the Central Asia Regional Economic Cooperation (CAREC) program. They find that in addition to these countries' levels of infrastructure development, the costs incurred at their border crossing sites and the speed of travel along the CAREC corridors are crucial to the trade between the five studied countries and their six fellow CAREC members.

Ramasamy & Yeung (2019) evaluate the impact of the One Belt One Road project on the trade of countries that have signed on to this project and nations along the six economic corridors. They examine the impact of the quality of border administration and physical infrastructure of 141 countries in the years 2008, 2010, 2012, 2014, and 2016. They find that changes in border administration have the most significant (99%) impact on corridor countries' exports. They stress the importance of trade facilitation besides physical infrastructure to ensure trade channels run smoothly throughout the numerous corridors.

Bugarčić et al. (2020) examine the effect of logistics performance on trade value in Central and Eastern Europe and Western Balkans. They use the logistic performance index (LPI) only for 2007 and 2018 to test the impact on the trade volume of 16 countries in Central and Eastern Europe. They find a positively significant effect of LPI on trade.

### 2.2 Empirical studies using TFIs as an explanatory variable

Several studies use trade facilitation index (TFIs) in their estimations based on a gravi-

ty model. Moïse & Sorescu (2013) build a model to investigate of TFIs on trade volume for 107 non-OECD for 2002–2010. They assume that trade facilitation indexes are relatively stable in this period. They use each component of trade facilitation as explanatory variables and find that information availability, simplification of documents, streamlining procedures, and automation significantly impact trade volume. The cumulative impact of these measures is a reduction of nearly 14.5% in total trade costs for low-income nations, 15.5% for lower middle-income nations, and 13.2% for upper middle-income nations.

Beverelli et al. (2015) study the impact of trade facilitation on the trade margin of 133 countries by considering the 2009 TFI. The study discovers that trade facilitation positively affects export diversification in Sub-Saharan Africa, Latin America, and the Caribbean. Fontagné et al. (2020) analyze how trade facilitation in destination countries impacts French firms' exports. They use TFIs for 2008 and consider 152 countries where French companies export their products. They find that while information availability helps exporters of all sizes, other policies, such as advance rulings, appeals procedures, and automation, tend to benefit large exporters. Thu & Thanh (2021) estimate the impact of trade facilitation measures on the trade value between 10 ASEAN countries and their respective 88 trading partners. They use the trade facilitation indexes of 2017 and 2019 to construct scorecards for ASEAN countries and reveal that non-tariff barriers and institutional coordination impact the trade flows of ASEAN economies the most.

This study intends to investigate the impacts of trade facilitation achievements of the former socialist countries on their trade volume. Specifically, the study focuses on the relationship between scores in TFIs and trade (exports and imports) between the targeted countries and their main trading partners. The gravity model is used to examine the relationship between trade facilitation and trade.

### 3. Methodology

#### 3.1 Model specification

This study is based on Beverelli et al. (2015), Fontagné et al. (2020), Moïse & Sorescu (2013), and Thu & Thanh (2021), which use TFIs as an explanatory variable in the gravity equation.

As mentioned before, previous empirical studies show the significant effect of trade facilitation on trade. The model envisages that the larger the two economies and the closer the distance between them, the more active trade occurs. Hence, besides the primary interest variable, TFIs, three standard gravity variables, namely GDP of targeted country, GDP of 10 major trading partners, and distance between capitals of own country and trading partner, are included in the equation.

The average trade facilitation performance indicator and each component are used to test the impacts on exports and imports. The targeted countries consist of 21 former socialist ones.

This study proposes the following equation:

$$\ln\_Trade_{ijt} = \alpha_i + \beta_1 \ln\_DIST_{ij} + \beta_2 \ln\_GDPT_{it} + \beta_3 \ln\_GDPP_{jt} + \beta_4 \ln\_TFI_{it} + \varepsilon_{ijt}$$

where  $i$  denotes twenty-one post-socialist countries of Central and Eastern Europe, CIS, and Central Asia, and  $j$  is the ten main trading partners of each of these 21 countries;  $t$  is the year (2017, 2019, and 2022);  $Trade_{ijt}$  presents exports and imports between targeted countries and partner countries  $i$  and  $j$  in the year  $t$ .  $DIST_{ij}$  denotes the distances between the capital cities of partner countries  $i$  and  $j$ . The expected sign of  $\ln\_DIST_{ij}$  is negative  $\beta_1 < 0$ .  $GDPT_{it}$  and  $GDPP_{jt}$  denote the gross domestic product (GDP) of targeted countries  $i$  and partner countries  $j$ , respectively, in the year  $t$ . The expected signs of  $GDPT_{it}$  and  $GDPP_{jt}$  are both positive  $\beta_2 > 0$ ,  $\beta_3 > 0$ .  $TFI_{it}$  is the trade facilitation indicators (average performance and specific component) of targeted 21 countries in the year  $t$ . The expected sign of  $\ln\_TFI_{it}$  is positive,  $\beta_4 > 0$ . An error term is presented by  $\varepsilon_{ijt}$ . All variables are measured in natural logarithms.

To address the heterogeneity issue, this study introduces area dummies and country dummies. Countries are divided into three regions: European and Baltic countries, Central Asia, and CIS. The list of countries and area classification is presented in the Appendix Table A1. Estimations with area dummies and countries' dummies consider unobserved individual characteristics of each region and each country.

### 3.2 Measurement and sources of data

Trade volume between two countries (one of the post-communist countries and one of its ten main trading partners) is retrieved for 2017, 2019, and 2022<sup>3)</sup> and converted into billions of USD. Trade volume is represented in export and import flows. Export and import volumes are adjusted for the export and import price indexes. The information for exports and imports is obtained from the UN Comtrade database. Data for the export and import price indexes, such as the Merchandise Trade Price Index for 2017, 2019, and 2020, are retrieved from the OECD database. It is worth mentioning that our trade data covers the COVID-19 eruption period.

The OECD's trade facilitation indicators reflect the main provisions of the WTO Trade Facilitation Agreement and seem to be a comprehensive proxy for the trade facilitation performance of countries. This indicator is a benchmarking instrument designed to provide factual data that is comparable geographically and consistently over time. The data sources for the indicator are publicly available information, direct submissions from countries, and information from the private sector. The indicator ranges from 0 to 2, with a value of 2 in-

dicating the highest performance. Data for 2017, 2019, and 2022 TFIs come from the OECD database. The average trade facilitation indicator and its specific components are used in the estimations.

Distance between capital cities of partner countries is measured in kilometers. Data for distance is taken from the French Center for Research Expertise (CEPII). The Center maintains gravitational data for related empirical studies.

GDP of targeted countries (GDPT) and GDP of main 10 trade partner countries (GDPP) are in terms of billions of international dollars at purchasing power parity rates of 2017. Information on GDP is retrieved for 2017, 2019, and 2022 from the World Development Indicators database.

#### 4. Empirical results and discussion

This section presents the empirical results of the 'TFIs' impact on export and import volume in Subsection 4.1 and discusses the implications of these results in Subsection 4.2. In the estimations, the robust standard errors are used to consider heteroscedasticity. Also, descriptive statistics are presented in Table 1.

Table 1: Descriptive statistics

Variable	Number of observations	Mean	Standard deviation	Minimum	Maximum	Variation of coefficients
Log Exports	630	3.129	.804	1.052	4.974	0.27
Log Imports	630	3.201	.674	1.571	4.884	0.21
Log TFI	630	.107	.133	-.249	.259	1.24
Log Distance	630	3.103	.441	1.908	4.201	0.14
Log GDP targeted	630	5.2	.563	4.461	6.605	0.10
Log GDP partner	630	6.061	.694	4.088	7.41	0.11

Note: All variables are in log form. Dummy variables are not included in the descriptive statistics.

The last column of the table indicates the variation of coefficients, the standard deviation of column (3) divided by the mean of column (2). The low coefficients of GDP targeted (0.10) and GDP partner (0.11) indicate relative stability when compared to the higher coefficient of TFI (1.24).

##### 4.1 Impact of the Trade Facilitation Indicator

Table 2 shows three estimated results of exports and imports determinants using the average trade facilitation index as an explanatory variable. Column (1) indicates the OLS estimated result of determinants of exports. The coefficient of TFI is positive and signifi-

**Table 2:** Impact of Trade Facilitation Indicator (average trade facilitation performance)

Independent Variables	Exports			Imports		
	(1)	(2)	(3)	(4)	(5)	(6)
Log Trade Facilitation Indicator (Average trade facilitation performance)	1.287***	0.800***	0.600	1.154***	0.571***	0.608
	(0.144)	(0.191)	(0.435)	(0.128)	(0.166)	(0.469)
Log Distance between trading partners	-0.516***	-0.442***	-0.438***	-0.655***	-0.586***	-0.517***
	(0.0631)	(0.0664)	(0.0509)	(0.0527)	(0.0562)	(0.0493)
Log GDP targeted	1.070***	1.074***	1.204***	0.846***	0.854***	1.912***
	(0.0281)	(0.0270)	(0.430)	(0.0251)	(0.0230)	(0.493)
Log GDP of trade partner	0.282***	0.260***	0.243***	0.408***	0.394***	0.366***
	(0.0360)	(0.0365)	(0.0291)	(0.0338)	(0.0337)	(0.0311)
Area Dummies		Yes			Yes	
Country Dummies			Yes			Yes
Constant	-2.684***	-2.828***	-3.397*	-1.805***	-2.067***	-6.773***
	(0.192)	(0.191)	(1.941)	(0.172)	(0.163)	(2.224)
R-squared	0.768	0.774	0.856	0.747	0.768	0.812
Number of observations	630	630	630	630	630	630

Note: The dependent variables are export and import volume. Robust standard errors in parentheses  
\*\*\*p<0.01, \*\*p<0.05, \*p<0.1

cant, as expected. The coefficient of Distance between targeted countries and trading partners is negative and significant. GDP targeted and GDP trade partner are significant with expected signs. The result of export determinants, column (2), which considers area heterogeneity, is consistent with our hypotheses, although the magnitude of TFI decreases.

When all country heterogeneity is considered as in column (3), while the coefficients of Distance between trading partners, GDP own and GDP trade partner are significant with expected signs, the coefficient of TFI becomes insignificant.

Columns (4), (5), and (6) illustrate the determinants of imports with OLS, OLS with area dummies, and country dummies. The results show the same as those of export determinants.

Although the previous studies (Beverelli et al., 2015; Fontagné et al., 2020; Moisé & Sorescu, 2013; Thu & Thanh, 2021) do not consider the heterogeneity of country effect, if area heterogeneity is only considered, the estimated results are consistent with them. The results, which consider country heterogeneity, cannot conform to those of the previous studies.

The correlation matrix of exports and imports in Table 3 stresses that there is a strong correlation between trade variables and TFI. The estimation with country dummies may absorb the impact of TFI on trade, thus making the coefficients of TFI become insignificant. Although the estimated results of Column (3) and Column (6) in Table 1 consider

Table 3: Pairwise correlations matrix

Variables	Export	TFI	GDP own	GDP partner	Distance
Export	1.0000				
TFI	0.4138	1.0000			
GDP targeted	0.8020	0.1878	1.0000		
GDP partner	0.2217	0.0501	0.1841	1.0000	
Distance	-0.0861	-0.1705	0.1154	0.6022	1.0000

  

Variables	Import	TFI	GDP own	GDP partner	Distance
Import	1.0000				
TFI	0.4312	1.0000			
GDP targeted	0.7479	0.1878	1.0000		
GDP partner	0.1374	-0.0466	0.0942	1.0000	
Distance	-0.1458	-0.2012	0.0860	0.7155	1.0000

country heterogeneity, GDP of own country may somehow reflect country heterogeneity and time effect. So, it is worthwhile to discuss more the estimated results with area dummies of Column (2) and Column (4). Columns (1) and (3) in Table A2 (Appendix) are re-posts of the estimated results with area dummies. The base area is European and Baltic former socialist countries. Column (2) is the estimated results of exports of conditional effect with TFI multiplied by area dummy. The coefficient of TFI in European and Baltic former socialist countries is 4.376 and positively significant. This result shows that a 1% increase in TFI stimulates approximately a 4.4% increase in exports. On the other hand, the coefficients of Central Asia and CIS are only 0.046 (4.376-4.330) and 1.351 (4.376-3.025). Since the European and Baltic area has already implemented high trade facilitation, whose TFI index is 1.675 in 2022 compared to 1.03 in Central Asia and 1.43 in CIS, well organized trade facilitation brings high trade performance. Regarding the import determinants of Column (4), the coefficient of TFI in the European and Baltic area is also high 3.063, while the coefficients of Central Asia and CIS remain low level, 0.23 (3.063-2.832), 0.27 (3.063-2.793) respectively.

What is the important factor of trade facilitation for trade performance? The average trade facilitation index is a composite index comprising 11 components. Instead of average TFI, each component of TFI is used as an explanatory variable alternatively. Table A3 and Table A4 in the Appendix show the estimated results of the impacts of each component of TFI on exports and imports. While in most of the cases, the coefficients of Distance, GDP targeted, GDP of trade partner have significant expected signs, coefficients of individual components are somewhat different from that of average TFI. For exports, Information Availability, Automation, and Internal Border Agency Co-operation have positively significant signs, although the coefficient of Documents is unexpected with a negative significant sign. For imports, the coefficients of Advance Rulings, Automation, Procedures, and



Internal Border Agency Co-operation are positively significant.

#### 4.2 Discussion of estimated results

The estimated results suggest that an increase in trade facilitation indicators is correlated with an increase in the values of exports and imports, except for cases when individual country characteristics are considered. Although the relationship is positive in the latter cases, it is statistically insignificant in most of the trade facilitation components. This result suggests that other country-unique factors may impact the relationship between those trade facilitation indicators and trade volume. The country-specific regression results of each component as an explanatory variable instead of average TFI show that automation, internal border agency co-operation, information availability (exports), advance rulings (imports), and procedures (imports) impact trade significantly. Hence, one can assume that the transition economies' trade is actively promoted through these trade facilitation components.

Trade facilitation indicators are a reflection of the institutional aspects of targeted countries. Kanybekov and Inaba (2023) find that each trade facilitation component reflects some aspect of institutions. Institutions can be divided into formal institutions (formal rules) and informal institutions (informal rules). The interaction of these two institutional elements can determine the pace of trade facilitation. It is useful to consider one of the trade facilitation components to describe how institutional interaction influences trade facilitation reforms. One can discuss the internal border agency co-operation indicator, which significantly impacts exports and imports in transition economies.

The internal border agency co-operation indicator prominently reflects how institutions function in cross-border trade activity. This indicator shows how informal rules of institutions underpin or hinder newly suggested formal rules by trade facilitation reforms. Kanybekov and Inaba (2023) discuss how the interaction of formal and informal rules can result in trade facilitation performance, including in internal border agency co-operation. They describe the case of the Kyrgyz Republic, where there is observed weak coordination of control activities among border authorities. Poor coordination leads to duplication of clearance requirements and excessive paperwork for traders. The reason for such coordination is the weak interest of border authorities in delegating their functions to other authorities. Keeping their initial functions allows some border officers to get unofficial remuneration. Complex bureaucratic procedures generate demand for informal services of officials for expedited clearance of goods. Thus, current informal rules provide opportunities for border officers to receive unofficial revenues. Hence, these officials are interested in maintaining the existing informal rules (according to which they receive remuneration for accelerated clearance of goods). In this way, the human factor expressed in informal rules plays an important role in the implementation of reforms.

Thus, the human factor of border-regulating agencies is important in explaining trade activity. Internal border agency co-operation indicator significantly impacts trade. In turn, this indicator is explained by institutional aspects. Current informal rules are most likely to be maintained by the vested interests of border officials. Accordingly, these informal rules hinder newly proposed formal rules by trade facilitation initiatives. Thus, the human factor plays an essential role in determining the internal border agency co-operation indicator, which in turn significantly affects trade.

## 5. Conclusion

This study assessed the effect of the trade facilitation performance of post-socialist countries of Europe and Central Asia on their exports and imports. Using a gravity model, the study estimated the relationship between the trade facilitation index and trade volume (exports and imports).

The estimated results, considering country-specific effects, demonstrate that the coefficients for distance, GDP of targeted countries, and GDP of partner countries are significant and align with expectations. However, although positive, the coefficient for the average trade facilitation performance is not significant. This study also considers that the GDP of targeted countries includes country-specific effects and time effects.

Although this study could not find the significant impact of the average trade facilitation on trade volume focusing on country-specific effects, using area dummies for area impact investigation has provided different impacts of TFI on trade performance.

In addition, the estimations with individual components and country dummies suggest that the Internal border agency co-operation indicator significantly impacts both exports and imports in transition economies. This indicator can be explained by institutions. For instance, current informal rules may be maintained by border officials with vested interests. Hence, such informal rules may conflict with newly proposed formal rules by trade facilitation reformers. This conflict results in poor coordination and cooperation between border-regulating agencies.

Trade facilitation performance can reflect how institutions work in cross-border trade activity. The pace of trade facilitation changes is determined by how informal rules of institutions interact with formal rules. Countries where informal rules support newly introduced formal rules may implement trade facilitation reforms faster. Transition economies with informal rules that support new formal rules initiated by trade facilitation tend to have more active trade. Thus, the human factor expressed through institutions is essential in considering trade facilitation performance.

Several limitations of this study should be considered. This study covers a short time by

taking only three years (2017, 2019, and 2022). The reverse causal effect or endogeneity issue is another limitation that deserves attention. Trade volume can also influence GDP, resulting in a two-way causal relationship. For example, increased trade volume may result in higher GDP due to improved market efficiencies and larger markets, whereas increasing GDP may increase a country's trade.

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### Notes:

- 1) The World Trade Organization was established in 1995, and the Trade Facilitation Agreement was concluded in 2013. After two-thirds of member countries ratified, the agreement came into force in 2017.
- 2) Georgia and Ukraine are included in this category since they were former members of the CIS. Currently, Ukraine is a party to the CIS Free Trade Area agreement.
- 3) Trade data for Russia and Belarus is retrieved for 2021, since data for 2022 is not available.

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## Appendix

Table A1 : Countries division by area

Central Asia				Commonwealth of Independent States (CIS)						European and Baltic former socialist countries										
Kazakhstan	Kyrgyz Republic	Tajikistan	Uzbekistan	Armenia	Azerbaijan	Belarus	Georgia	Moldova	Russia	Ukraine	Albania	Bulgaria	Czech Republic	Estonia	Hungary	Latvia	Lithuania	Poland	Romania	Slovak Republic

Note: Georgia and Ukraine are in this category since they are former members of the CIS. Currently, Ukraine is a party to the CIS Free Trade Area agreement.

Table A2 : The impact of TFI based on the conditional effect model

Independent Variables	Exports		Imports	
	(1) Area dummy	(2) Conditional effect	(3) Area dummy	(4) Conditional effect
Log Trade Facilitation Indicator (Average trade facilitation performance)	<b>0.800***</b> (0.191)	<b>4.376***</b> (0.511)	<b>0.571***</b> (0.166)	<b>3.063***</b> (0.395)
Log Distance between trading partners	-0.442*** (0.0664)	-0.401*** (0.0636)	-0.586*** (0.0562)	-0.570*** (0.0556)
Log GDP targeted	1.074*** (0.0270)	1.065*** (0.0250)	0.854*** (0.0230)	0.846*** (0.0222)
Log GDP of trade partner	0.260*** (0.0365)	0.237*** (0.0351)	0.394*** (0.0337)	0.391*** (0.0332)
TFI* Central Asia Dummy		-3.025*** (0.704)		-2.832*** (0.539)
TFI* CIS Dummy		-4.330*** (0.546)		-2.793*** (0.443)
Central Asia Dummy	-0.212*** (0.0785)	0.524*** (0.121)	-0.208*** (0.0705)	0.278*** (0.0981)
CIS Dummy	-0.187*** (0.0487)	0.576*** (0.113)	-0.285*** (0.0392)	0.237*** (0.0884)
Constant	-3.312*** (0.204)	-3.312*** (0.204)	-1.782*** (0.163)	-2.281*** (0.175)
R-squared	0.774	0.796	0.768	0.781
Number of observations	630	630	630	630

Table A3: Impact of trade facilitation indicators on export (with country dummy)

Independent Variables	Export										
Log Trade Facilitation Indicator (TFI)	0.600 (0.435)										
Log Information Availability	0.966*** (0.327)										
Log Involvement of the Trade Community		0.293 (0.358)									
Log Advance Rulings			0.247 (0.558)								
Log Appeal Procedures				0.485 (0.467)							
Log Fees and Charges					0.222 (0.374)						
Log Documents						-0.253** (0.124)					
Log Automation							1.071*** (0.250)				
Log Procedures								-0.0349 (0.260)			
Log Internal Border Agency Co-operation									0.882*** (0.193)		
Log External Border Agency Co-operation										0.445 (0.497)	
Log Governance and Impartiality										-0.0474 (0.169)	
Log Distance between trading partners	-0.438*** (0.0509)	-0.441*** (0.0509)	-0.438*** (0.0417)	-0.438*** (0.0510)	-0.439*** (0.0510)	-0.439*** (0.0510)	-0.437*** (0.0508)	-0.438*** (0.0510)	-0.436*** (0.0510)	-0.438*** (0.0510)	
Log GDP targeted	1.204*** (0.430)	0.767* (0.446)	1.487*** (0.475)	1.505*** (0.414)	1.524*** (0.449)	2.349*** (0.433)	1.220*** (0.373)	1.758*** (0.435)	0.0507 (0.416)	1.775*** (0.419)	
Log GDP of trade partner	0.243*** (0.0291)	0.243*** (0.0290)	0.242*** (0.0243)	0.243*** (0.0292)	0.243*** (0.0244)	0.243*** (0.0291)	0.243*** (0.0289)	0.243*** (0.0291)	0.243*** (0.0244)	0.243*** (0.0291)	
Country Dummies	Yes										
Constant	-3.397*** (1.941)	-1.365 (2.023)	-4.713** (2.120)	-5.358*** (1.906)	-4.828*** (1.843)	-4.846** (2.020)	-8.612*** (1.970)	-3.434** (1.686)	-5.892*** (1.958)	0.314 (2.020)	-4.050* (2.283)
R-squared	0.856	0.858	0.856	0.856	0.856	0.856	0.856	0.840	0.856	0.860	
Number of observations	630	630	630	630	630	630	630	630	630	630	

Note: The dependent variables are export and import volume. Robust standard errors are in parentheses. \*\*\* p<0.01, \*\* p<0.05 and \* p<0.10.

Table A4: Impact of trade facilitation indicators on import (with country dummy)

Independent Variables	Import									
Log Trade Facilitation Indicator (TFI)	0.608 (0.469)									
Log Information Availability		0.279 (0.417)								
Log Involvement of the Trade Community			0.435 (0.358)							
Log Advance Rulings			0.929* (0.557)							
Log Appeal Procedures				0.496 (0.470)						
Log Fees and Charges					0.0728 (0.413)					
Log Documents						0.137 (0.129)				
Log Automation							0.818*** (0.118)			
Log Procedures								0.517* (0.271)		
Log Internal Border Agency Co-operation									0.410* (0.213)	
Log External Border Agency Co-operation										0.338 (0.440)
Log Governance and Impartiality										-0.0190 (0.156)
Log Distance between trading partners	-0.517*** (0.0493)	-0.436*** (0.0503)	-0.434*** (0.0417)	-0.435*** (0.0503)	-0.435*** (0.0502)	-0.435*** (0.0502)	-0.543*** (0.0400)	-0.434*** (0.0501)	-0.434*** (0.0502)	-0.435*** (0.0503)
Log GDP targeted	1.912*** (0.493)	2.511*** (0.493)	2.447*** (0.475)	2.469*** (0.429)	2.571*** (0.435)	2.723*** (0.468)	2.442*** (0.446)	2.142*** (0.438)	2.181*** (0.489)	2.545*** (0.500)
Log GDP of trade partner	0.366*** (0.0311)	0.244*** (0.0287)	0.243*** (0.0243)	0.243*** (0.0243)	0.244*** (0.0288)	0.244*** (0.0288)	0.281*** (0.0252)	0.243*** (0.0287)	0.243*** (0.0287)	0.244*** (0.0288)
Country Dummies	Yes									
Constant	-6.773*** (2.224)	-8.912*** (2.246)	-8.701*** (2.119)	-8.885*** (1.903)	-9.273*** (1.948)	-9.885*** (2.111)	-1.744*** (0.235)	-7.292*** (1.971)	-7.368*** (2.240)	-8.915*** (2.397)
R-squared	0.812	0.796	0.796	0.796	0.796	0.795	0.764	0.797	0.797	0.796
Number of observations	630	630	630	630	630	630	630	630	630	630

Note: The dependent variables are export and import volume. Robust standard errors are in parentheses. \*\*\*p<0.01, \*\*p<0.05 and \*p<0.10.