INSTITUTIONAL DETERMINANTS OF AGRO-FOOD TRADE[1]

[1]Stefan Bojnec
Faculty of Management
University of Primorska
Cankarjeva 5, SI-6104
Koper p.p. 345
Slovenia
Tel.: +386 5 610 20 46
Fax: +386 5 610 20 15
E-mail: stefan.bojnec@fm-kp.si
*   stefan.bojnec@siol.net*

[2]Imre Ferto
Affiliation 1:
Institute of Economics, Hungarian Academy of Sciences
Budaörsi str. 45
H-1112 Budapest
Hungary
Tel.: +36 1 3092665
Fax: +36 1 3193136
E-mail: ferto.imre@krtk.mta.hu

Affiliation 2:
Corvinus University of Budapest
Fővám tér 8
H-1093 Budapest
Hungary
E-mail:imre.ferto@uni-corvinus.hu

[1]Stefan Bojnec, a Professor of Economics at the Faculty of Management, University of Primorska, Koper, Slovenia. He published his works in leading journals, such as, Journal of Business Economics and Management. He received the Slovenian state recognition in science in 2008.

[2]Imre Ferto, a Professor at the Corvinus University of Budapest and a Senior Research Advisor in the Institute of Economics at the Hungarian Academy of Sciences, Budapest, Hungary. He published numerous articles in leading journals, such as, China Economic Review and Journal of Agricultural Economics.

ABSTRACT*. The paper investigates the effects of the institutional drivers on trade in agricultural and food products using a gravity trade model. The focus is on the effects of quality of institutions and similarity of institutions in explaining variation in bilateral agricultural and food exports among the Organisation for Economic Cooperation and Development (OECD) countries. The empirical results confirm the separate effects for similarity of institutions and quality of institutions with agro-food export patterns. The similarity of institutions has significant but mixed associations with the agro-food exports in similar institutional frameworks. The effect of quality of institutions on agro-food exports varies: different institutions have different impacts on the agro-food exports. The good quality of institutions reduces the effects of the distance, which jointly with the level of economic development in importing OECD countries encourages the international agro-food trade.*

Introduction

The literature on international trade has focused on the role of the formal tariff and non-tariff trade barriers of trade (e.g., Baier, Bergstrand, 2006). Anderson, Van Wincoop (2004) focus on both formal tariff and non-tariff trade barriers and other types of trade, transportation, and retail distribution costs in the review of trade costs. The previous researches has as well underlined the importance of some other trade barriers and trade costs, such as, McCallum (1995) for the informal trade barriers, Rauch (2001) for the information distance costs, and Obstfeld, Rogoff (2000) for the unobserved trade costs. In addition, a variety of literature has emphasised the impacts of institutions on the transaction costs in bilateral international trade (e.g., Anderson, Marcouiller, 2002; Dollar, Kraay, 2003; de Groot *et al.*, 2004; Depken, Sonora, 2005; Levchenko, 2007; Francois, Manchin, 2007). The empirical literature on the agro-food trade has focused on the border effect, which was estimated from a gravity model, to assess the level of agricultural market trade integration (Olper, Raimondi, 2008). Bojnec, Fertő (2009) have investigated the similarities and differences in agro-food relative trade advantages/disadvantages, while Bojnec, Fertő (2010) have investigated differentiation of quality in the East-West European agro-food trade during the pre-accession period. Except for Olper, Raimondi (2009), the investigation of the institutions impact on the trade costs as a possible determinant of bilateral agro-food trade has been neglected. This is the motivation of this research, particularly in the context of the recent economic and financial crisis, when questions about institutions and confidence between exporters and importers are the most important. In this economic context, this article aims to identify and estimate the effects of the institutional variables on bilateral agricultural and food exports. The article focuses on the impacts of quality of institutions and similarity of institutions as drivers of agricultural and food export performance between the OECD countries.

The novelties and contributions of this article in the literature are threefold. First, this study investigates the impact of distance conditional on the similarity of institutions using a composite institutional index and the impact of distance conditional on the quality of institutions on agricultural and food exports. The starting point of this analysis is the model of baseline gravity trade. Second, the baseline model is gradually extended to test the impacts of quality of institutions and similarity of institutions (de Groot *et al.*, 2004), the distance conditional on institutions (Freund, Weinhold, 2004), and the level of economic development in agro-food exports. The agriculture dummy variable is used to distinguish between agricultural products and processed food products in exports. Third, the article employs the econometric estimation approach using the Poisson Pseudo-Maximum Likelihood (PPML) estimator model. The gravity framework model is adopted as proposed by Santos Silva, Tenreyro (2006). The econometric estimations include variables for the general quality of institutions applying a composite institutional index for agricultural and food exports.

The rest of the article is structured in the following five sections. *Section 1* reviews the literature on the role of institutions as a driver of export performance. *Section 2* and *Section 3*

present the used methodology and data. The variables of a special concern in the empirical analysis are the quality of institutions and similarity of institutions. *Section 4* presents and discusses the econometric regression results for the baseline model specification and the alternative model specifications. The gravity trade models are tested for additional robustness check exercises to include the variables for quality of institutions, similarity of institutions, agriculture dummy, distance, economic development, and some of their interaction effects. Finally, *Section 5* presents the main conclusions.

1. Literature Review

North (1990) argues that the better institutions are intended to reduce the uncertainty in exchange because of the imperfect insight and incomplete information. Therefore, the better institutions can play a crucial role in society by influencing the enforceability of contracts and reducing the transaction costs due to the provided positive externalities for the private transactions. Institutions are influencing the level of trade, economic growth, and sustainable economic development (e.g., Anderson, Marcouiller, 2002; de Groot *et al.,* 2004; Möhlmann *et al.*, 2009).

Therefore, the good institutions are important drivers of the export performance. The effect of institutions on the sectoral export specialization can be both direct and indirect. Olper, Raimondi (2009) summarize that quality of institutions negatively affects the trade costs, both affecting transaction costs directly or indirectly and conditioning the enabling environment of the transaction. The good quality of institutions is likely to be associated with lower transaction costs when facilitating the contraction and long term agreements between the different agents in different stages of the agro-food value chain. Thus, the good quality of institutions is fostering more complex economic exchanges and production processes. The contraction of outsourcing activities that can be performed more efficiently elsewhere outside of the firm in the economy can be less costly when the institutions in the place are able to enforce contracts and ensure property rights, and, thus, decrease the transaction costs.

Different types of institutions can contribute to a sectoral composition of a country's agro-food export as well. This can be a complex activity associated with the significant sunk costs (Bilkey, 1978; Roberts, Tybout, 1997; Martincus, Gallo, 2009). The quality of institutions can be important in shaping the decision-making process whether the firms participate in the international markets and the sectoral specialization pattern. The quality of institutions can assure greater transparency by influencing the enforceability of contracts, which may contribute to shaping countries' comparative advantage in the exports of agro-food products with different degrees of processing complexity. The good quality of institutions might explain why the natural resource based sectors, including agriculture, have generated stronger intersectoral linkages in the economy and, thus, broader diversification production and exporting opportunities. The empirical studies provides the evidence which supports the hypothesis that institutions and their quality represent an important driver of sectoral export performances (e.g., Blanchard, Kremer, 1997; Schuler, 2003; Berkowitz *et al.,* 2006; Levchenko, 2007; Nunn, 2007; Ranjan, Lee, 2007; Méon, Sekkat, 2008).

Institutions may have an indirect effect on the trade through the investments and productivity improvements (e.g., Katona, 2005). Martincus, Gallo (2009) find that the countries with a better quality of institutional environment can have a comparative advantage in sectors producing goods, which require more intensive use of higher quality of institutions, such as, higher processed food requiring higher food standards. This article investigates only the agricultural and food exports.

To sum up, the main arguments, both in the theoretical and empirical literature, confirm that the better institutions facilitate better export performance, and the opposite that better performing countries in exports have developed better institutions. However, the impact of institutions cannot be uniform across the product groups or industries. The specificity of agricultural and food products in comparison to the other sectors is that their trade requires specific fitosanitary, veterinary, food quality and health standards and practices with specific institutions. Therefore, it is assumed that the agricultural and food products are different, in that food products are more complex differentiated goods than the primary agricultural produce.

The hypotheses are the following. First, it is expected that the better quality of institutions fosters agro-food exports. As previously argued by Méon, Sekkat (2008), this general positive association can be different across economy sectors. Agriculture and the food sectors differ from each other by the degree of verticalisation of production. Agriculture is more a subject to the specific government support measures, while the food products, in addition, are more a subject to the public and private food standards (e.g., veterinary, fitosanitary, and food health and quality standards) (e.g., Jongwanich, 2009). The authors of this article expect that the quality of institutions might have different impacts on the agricultural and food exports. Second, it is expected that the better quality of institutions will raise the exports by lowering the international transactional costs for more complex food products. The set standards and rules of the game improve the trust and encourage the food exports. Third, the impact of institutions' quality on the agricultural exports can be positive or negative. The reasons for the positive association with the agricultural exports are similar as with the food exports: the better quality of institutions may encourage the flows of agricultural exports. The negative impact can be explained when the agricultural export is determined by a persistent inefficient quality of institutions. Finally, due to a product-specific quality of institutions, i.e., agricultural vs. food products, different types of institutions may differently affect the agricultural and food exports.

2. Methodology

Several econometric challenges are related to the estimation of gravity models to assess the trade patterns on the basis of the empirical results. Among the crucial issues in empirical estimation is the correct specification and interpretation of the gravity equation. Two methodological issues are particularly relevant. First, studies have argued that standard cross-sectional econometric methods yield biased results because they do not control heterogeneous trading relationships (e.g., Feenstra, 2004; Helpman *et al.,* 2008). The problem related to the unobserved heterogeneity does not apply only on the country-pair level, but also on the importer and the exporter level, where the resistance terms can play an important role (Anderson, Van Wincoop, 2003, 2004). Cheng, Wall (2005) employ the country-pair effects. They are set differently depending on the direction of the trade flows. They apply the fixed effect methods for the gravity trade equation with included country-pair and time period dummies as additional explanatory variables. The fixed-effect gravity trade models allow capturing the unobserved or mis-specified factors. They simultaneously explain the trade volume between a pair of two countries in such a way that there is the probability that these two countries are in the same regional integration regime (e.g., Matyas, 1997; Egger, 2002). Although the arguments underlying the use of the fixed effects as a solution to the unobserved heterogeneity are roughly the same, there is little agreement in the literature how actually to specify the fixed effects. Following Cheng, Wall (2005), the fixed effect methods are applied,

in which the country-pair and time period dummies with importer and exporter fixed effects are used to reflect the bilateral relationship between the trading partners.

The second econometric issue is how to deal with the zero-valued bilateral trade flows. It is known that the standard gravity models cannot easily deal with zero trade flows. This has resulted in a widespread practice to ignore zero flows in the analysis of bilateral trade in the literature. However, the zero-valued observations contain important information, which helps to understand the patterns of bilateral trade flows better. Therefore, they should not be discarded as a priori. Several methodological approaches have been applied or suggested to address the problem of zero trade flows. The first, most common solution confines the sample of non-zero observations in order to avoid the estimation problems related to the zero trade flows. The second solution is that (part of the) zero values may be substituted by a small constant. In this way, the double-log model can be estimated without throwing these zero country trade flow pairs out of the sample. The third types of studies have employed the standard Tobit model to estimate the gravity equation with zero trade flows (e.g., Rose, 2004; Anderson, Marcouiller, 2002). The fourth types of studies apply the Heckman (1979) sample selection model to deal with the zero trade values (Francois, Manchin, 2007; Linders, de Groot, 2006) arguing that this model is preferred both theoretically and econometrically. Finally, Santos Silva, Tenreyro (2006) propose the PPML estimator to solve the heteroscedascity problem. Martin, Pham (2008) argue that, in the case of the small fraction of the zero values, the PPML estimator model is the preferred method to be used in the estimation. The present analysis show that the share of the zero trade flows is less than 10%; thus, the authors of this article use the PPML estimator model in the estimations.

The basic gravity equation has been initially developed from the Newton's theory of gravity without any explicit theoretical foundation. The literature has proposed different theoretical bases for gravity modelling (e.g., Anderson, Van Wincoop, 2003, 2004). An adapted gravity trade theory points out that the bilateral trade of exporter i and importer j countries in time t (Xij,t) is positively associated with their national incomes and negatively associated with their geographical distance (e.g., Brada, Mendez, 1993; Frankel, Rose, 2002). The following adapted gravity trade model is specified and used in our empirical analysis:

$$lnXij,t=\alpha0+\alpha t+\alpha i+\alpha1lnGDPi,t+\alpha2lnGDPj,t+\alpha3lnGDPCAPi,t+\alpha4lnGDPCAPj,t+\alpha5lnDistanceij+\alpha6Contiguityij+\alpha7Languageij+\alpha8RFTAij+\alpha9Quality\ of\ institutionsit+\alpha10Quality\ of\ institutionsjt+u1 \qquad (1)$$

where Xij,t is agro-food exports of country i to country j at time t, GDP is gross domestic product, GDPCAP is gross domestic product per capita, and RFTA is a Regional Free Trade Agreement. The authors of this article separate between the exports of agricultural and food products using the agriculture dummy variable to test for possible presence of a structural break in the model considering the agricultural versus food export types. The agriculture dummy variable equals to one for the export of agricultural products and equals to zero for the food products. By combining the agriculture dummy variable interaction effects with the quality of institutions and similarity of institutions variables, the authors of this article were as well able to test the hypothesis on the institutional differential by product types and whether they matter for the association with the agricultural versus food exports. Moreover, the authors of this article conduct the robustness tests using the additional gravity model specifications for the effects of quality of institutions in distance and the effects of the level of economic development with different interactions' effects. Finally, the importance of exporter and importer specific effects, rather than country-pair effects that explains the bilateral trade, are tested (e.g., Matyas, 1997).

3. Data

The trade data are supplied by the OECD Bilateral Trade Database at the two-digit level of the International Standard Industrial Classification (ISIC) in US dollars. Data for the agricultural and food products are used separately. The sample contains 29 OECD countries[2] in the 1995-2003 period, resulting in 14,616 observations pooling together the agricultural and food products.

The real GDP is a proxy variable for the market size, and GDPCAP means the per capita GDP, which is a general proxy variable for the level of economic development in the purchasing power parity US dollars. Data are used for both exporter and importer OECD countries. The data are obtained from the World Bank, World Development Indicators (WDI) database. The geographical distance is expressed in kilometres between the capital cities in OECD countries i and j (Distance$_{ij}$). The used dummies reflect whether countries i and j share the following proximities: a common land border (Contiguity$_{ij}$), cultural linkage and their primary common language (Language$_{ij}$), and membership in a RFTA$_{ij}$. The data on geographical distance and dummy variables are collected from the Centre d'Etudes Prospectives et d'Informations Internationales (CEPII): http://www.cepii.fr/anglaisgraph/bdd/distances.htm) database. The authors of this article as well include the Long Distance dummy variable, which equals one, when the distance between exporter and importer countries exceeds the average distance between all OECD countries in the data sample, and zero otherwise. The variables of particular interest for this analysis are the level of subjective *quality of institutions*. This set data include the quality of institutions' indices, which are produced by the Fraser Institute for institutions (Gwartney, Lawson, 2005). The quality of institutions indices are obtained from the "Economic Freedom of the World" (EFW) database. These indices are designed to measure the consistency of a national institutions and policies with the concept of economic freedom. The EFW quality of institutions indices are based on several sub-indices designed to measure the degree of "economic freedom" in the five areas:

1) *government size*: expenditures, taxes, and enterprises;

2) legal structure and protection of property rights (*legal system*);

3) access to *sound money*: inflation rate and the possibility to own foreign currency bank accounts;

4) freedom to trade internationally: taxes on international trade, regulatory trade barriers, capital market controls, difference between the official exchange rate and black market rate, and similar (*tariff*);

5) *regulation* of credit, labour, and business. Each of these economic freedom indices range from 0 (bad) to 10 (good) and reflect the distribution of the underlying data. This article employs indices of the quality of institutions for the following years: 1995, 2000, 2001, 2002, and 2003. The data for the years, which are not reported in the primary data source, are interpolated values on the basis of the available values for the reported years.

---

[2] The following 29 OECD countries are included in the data sample: Australia, Austria, Belgium, Canada, The Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, South Korea, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, Spain, Slovakia, Sweden, Switzerland, Turkey, the United Kingdom, and the United States of America.

Table 1. Correlation matrix

	agro-food export	log GDP of exporter	log GDPCAP of exporter	log GDP of importer	log GDPCAP of importer	government size	legal system	sound money	regulation	tariff	institute
agro-food export	1.0000										
log GDP of exporter	0.2126*	1.0000									
log GDPCAP of exporter	0.1311*	0.1198*	1.0000								
log GDP of importer	0.2537*	-0.0323*	0.0047	1.0000							
log GDPCAP of importer	0.1153*	0.0049	-0.0111	0.1200*	1.0000						
government size	0.0068	0.1987*	-0.1399*	0.0031	0.0321*	1.0000					
legal system	0.0838*	-0.0805*	0.8130*	-0.0015	-0.0405*	-0.1919*	1.0000				
sound money	0.1095*	0.0862*	0.8790*	0.0044	-0.0116	-0.1781*	0.7196*	1.0000			
regulation	0.1037*	-0.0410*	0.5677*	-0.0002	-0.0244*	0.2333*	0.7219*	0.4741*	1.0000		
tariff	0.1167*	0.0122	0.4097*	0.0105	0.0150	-0.1490*	0.4237*	0.4323*	0.3387*	1.0000	
institute	0.1205*	0.0669*	0.7936*	0.0039	-0.0113	0.2681*	0.8291*	0.7678*	0.8441*	0.5225*	1.0000

Note: * significance at 5 per cent.

Source: authors' calculations.

All the aspects of quality of institutions are interrelated; thus, the indicators of quality of institutions are highly positively correlated as it can be seen in *Table 1*, which presents the corresponding pairwise correlation matrix. The high correlation coefficients are the reason why these indicators of quality of institutions are treated separately in the empirical analysis. The serious problems of multi-collinearity are identified when too many indicators of quality of institutions are used simultaneously. In addition, a composite index of quality of institutions (*institute*) captures the overall quality of institutions and governance in a country. The composite index of quality of institutions (*institute*) is calculated as the simple arithmetic average of the scores in each separate indicator of quality of institutions and reflects the overall quality of governance.

The correlation coefficients between the dependent agro-food exports variable and the corresponding explanatory variables are relatively low, clearly confirming the absence of possible problem of endogeneity of agro-food exports vis-à-vis explanatory variables. As expected, there is, however, a stronger correlation between some pairs of explanatory variables: GDPCAP of exporters, legal system, sound money, regulation, and the composite index of quality of institutions as well as between the single pair between the tariff and the composite index of quality of institutions.

4. Econometric Results

The authors of this article start the presentation of the econometric results by the baseline model estimations, and then gradually extend the model specifications of the role of the quality of institutions and similarity of institutions, the distance effects conditional on institutions, and the level of economic development effects conditional on institutions.

4.1 Baseline Model Estimations

The starting point of these empirical results is the baseline gravity model without the institutional variables. *Table 2* shows the PPML model estimations for the agro-food products. The baseline gravity models confirm that the GDP size is significantly positively associated in the importing OECD countries. The greater is the economic size of the importing OECD

countries, the greater is the demand for the foreign goods, and, thus, the greater is the import of agro-food products from the partner OECD countries. GDPCAP is significantly negatively associated in the importer countries. This finding is inconsistent with the Linder's (1961) demand growth hypothesis arguing that higher incomes in the importing countries are encouraging an increase in the demand for the varieties by consumers in these countries. This means that it is positively associated with the agro-food exports from the other OECD partners' countries. Consistently with the theoretical expectation, the Distance between the countries' capitals is significantly negatively associated with the bilateral agro-food exports. The greater is the Distance, the lower is the bilateral agro-food exports implying the export preferences towards more proximate countries. The Contiguity, Language and RFTA dummy variables are significantly positively associated with the agro-food exports. The negative significant regression coefficient for the agriculture dummy variable in the baseline2 model implies a structural break in the model: as the agricultural export increases, the agro-food exports decline.

Table 2. Baseline models and the quality of institutions

	Baseline1	Baseline2	government size	legal system	sound money	regulation	tariff	institute
log GDP of exporter	-0.958	-0.958	-1.228**	-0.997	-1.022*	-0.799	-0.805	-0.788
log GDP of importer	4.409***	4.409***	4.078***	4.316***	4.324***	4.118***	3.855***	4.539***
log GDPCAP of exporter	0.886	0.886	1.110*	0.922	0.906	0.734	0.679	0.729
log GDPCAP of importer	-3.766***	-3.766***	-3.434***	-3.662***	-3.773***	-3.410***	-3.249***	-3.925***
log Distance between capitals	-0.682***	-0.682***	-0.682***	-0.682***	-0.683***	-0.683***	-0.682***	-0.683***
Contiguity	0.500***	0.500***	0.502***	0.500***	0.500***	0.500***	0.500***	0.500***
Language	0.500***	0.500***	0.501***	0.498***	0.499***	0.504***	0.500***	0.500***
RFTA	0.960***	0.960***	0.963***	0.962***	0.959***	0.959***	0.960***	0.959***
Agriculture		-0.810***	-1.667***	0.982***	2.457***	-1.136***	3.138***	-0.007
Quality of institutions of exporter			-0.008	0.036	0.120***	0.023	0.199**	0.131
Quality of institutions of importer			0.122***	0.014	0.111***	-0.048	-0.128	0.121
Quality of institutions of exporter*Agriculture			0.202***	-0.141***	-0.183***	0.175***	-0.454***	0.062
Quality of institutions of importer*Agriculture			-0.038**	-0.077***	-0.165***	-0.132***	-0.033	-0.171***
Pseudo R^2	0.8521	0.894	0.8994	0.8963	0.8967	0.8964	0.8972	0.8948
N	14616	14616	14616	14616	14616	14616	14616	14616
Wald test (p value)		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Note: * $p<0.1$; ** $p<0.05$; *** $p<0.01$. Exporter and importer fixed effects are included in the regression models.

Source: authors' calculations.

4.2 Explanatory Role of the Quality of Institutions

The adapted gravity regression results are presented in two steps (see de Groot *et al.*, 2004). The authors of this article are focusing on the explanatory effect of quality of

institutions and the similarity of institutions for the intensity of agro-food export between the OECD countries. Firstly, the authors of this article present the explanatory effect of *quality of institutions*, then, test whether the quality of institutions may determine the agro-food export. Secondly, the authors of this article focus on the hypothesis whether the quality of institutions have different impacts between the agricultural and food exports.

Table 2 presents the effects of *quality of institutions* on bilateral agro-food exports. An indicator of the perceived quality of a country's quality of institutions framework is included in each gravity model specification. The column headings provide the relevant variable for each model specification. The PPML model estimations of quality of institutions confirm some similarities and differences of the results. The association of the different quality of institutions framework varies in the sign for the direction of theoretical association and statistical significance indicating that different institutions have different impacts on the agro-food exports. The association that pertains the quality of institutions for the OECD exporting countries is found to be significantly positive only for the model specifications with variables for the sound money and the tariff. On the other hand, the coefficients of quality of institutions are significantly positive for the government size and the sound money in the OECD importing countries.

The significant results of the regression coefficients for the agriculture dummy variable differ by the sign of the association. They are positive for the legal system, sound money, and tariff, but negative for the government size and regulation. They are indicating that the agricultural export differs from the food export. The different institutional importance between the agricultural and food exports is reinforced further by the regression coefficients, which are specified for the interaction effect of the agriculture dummy with the quality of institutions. The variables for government size and regulation that are associated with the agricultural exports have a positive effect on the agro-food exports to the exporting OECD countries, but a negative sign for the variables of the legal system, sound money, and tariff. The interaction effects are negative in sign for the importing OECD countries clearly implying that the higher quality of institutions for agricultural trade in the importing countries discourages the bilateral agro-food exports between the OECD countries due to developed import barriers and protectionist policies.

These results suggest the relevance of *quality of institutions* for the bilateral agro-food exports between the analysed OECD countries. The analysed OECD agro-food exporting countries exploit the sound money and comparative advantages arising from the effects of trade liberalisation as drivers for the increases in the agro-food exports. The econometric results confirm that better quality of institutions in the exporting countries improves the competitive export requirements and encourages agro-food exports between the OECD countries.

4.3 Similarity of Institutions

The authors of this article focus on investigating the role of similarity of institutions in agro-food exports. It is expected that the bilateral countries' familiarities, in terms of the similarity of institutions of trading partners with similar both formal and informal norms of behaviours and institutions, in doing the international agro-food trade businesses increases the compatibility and trust. In turn, this reduces the adjustment costs and insecurity in agro-food exports. Therefore, the similarity of institutions can be an additional factor affecting relative transaction costs as an explanatory driving factor in bilateral agro-food exports.

The effect of similarity of institutions on agro-food exports in econometric analysis appears to depend on how inclusive is the set of "similar" countries in the analysed data sample. De Groot *et al.* (2004) propose to use a dummy variable equal to one, which captures the effect of the similarity of institutions, and zero otherwise. This dummy variable is included in the regression to capture the absolute difference between the bilateral partner countries' quality of institutions. If the absolute difference in the composite index of quality of institutions *(institute)* between the exporting and importing countries is below a specified fraction of the sample standard deviation (e.g., one standard deviation) in the composite index of quality of institutions of the analysed OECD countries, the quality of institutions is regarded as similar in both exporting and importing OECD countries. However, this methodology might be subject to criticism due to two reasons. First, the preliminary analysis shows that using one standard deviation as a criterion 44% of the analysed OECD countries are classified as similar in terms of quality of institutions. When the cut-off criterion is relaxed to two or three standard deviations, the fraction of "similar" analysed OECD countries increases to 77% and then to 93%. This suggests that the only those analysed OECD countries that differ widely in terms of quality of institutions − for a pair of countries that has both high levels of quality of institutions and low levels of quality of institutions − are seen as dissimilar. Second, the obtained results in the previous section highlighted that the different types of institutions may have different impacts on the agro-food exports. Thus, the composite index of quality of institutions may hide the different effects of each specific type of institution. In addition, using standard deviations as the threshold to identify the similarity of institutions may result in different subsamples for similar countries for each type of the institution. The calculations show that the share of similar countries varies from 40% to 70% of the total sample across different types of institutions.

Thus, an alternative approach to identify the similarity of institutions is applied, which is still based on the absolute difference between partner countries' quality of institutions. In order to provide the same fraction of the subsample of similar analysed OECD countries for each type of institution, the authors of this article divide the countries into percentiles (quartiles) regarding the absolute quality of institutions difference between partners. A strict threshold for the similarity of institutions is defined. Namely, the authors classify only the first quartiles of absolute difference of quality of institutions as similar countries.

Table 3. The role of similarity of institutions

	government size	legal system	sound money	regulation	tariff	institute
log Distance between capitals	-0.755***	-0.742***	-0.746***	-0.746***	-0.743***	-0.741***
Contiguity	0.566***	0.603***	0.603***	0.591***	0.612***	0.597***
Language	0.289***	0.307***	0.264***	0.275***	0.289***	0.292***
RFTA	0.841***	0.902***	0.888***	0.904***	0.896***	0.902***
Quality of institutions of exporter	0.115**	-0.029	0.092**	-0.144**	-0.236**	-0.002
Quality of institutions of importer	0.217***	-0.073**	0.082**	0.053	-0.065**	-0.017
Similarity of institutions	-0.755***	-0.742***	-0.746***	-0.746***	-0.743***	-0.741***
N	14616	14616	14616	14616	14616	14616
Pseudo R^2	0.8594	0.8576	0.8577	0.8576	0.8579	0.8574

Note: * p<0.1; ** p<0.05; *** p<0.01. Quality of institutions represents unweighted mean value for the *institute*. Exporter and importer fixed effects are included in the regression models.

Source: authors' calculations.

Table 3 and Table 4 present the PPML model estimation effects of *similarity of institutions* on agro-food exports. The specifications for the similarity of institutions in the adapted gravity model are estimated when controlling the level of quality of institutions in both exporting and importing OECD countries. The estimated models are presented by different types of the similarity of institutions with their impacts on bilateral agro-food exports.

The agro-food exports are confirmed, similarly as by de Groot *et al.* (2004) for the merchandise trade, in order the similarities of institutions and quality of institutions have separate effects. Unlike the theoretical expectations, Table 3 shows a significant negative association between the agro-food exports and different types of similarity of institutions. In addition, the signs of the regression coefficients for quality of institutions are mixed: significantly positive for the government size and sound money, but significantly negative for the tariff of both the exporter and importer OECD countries. The latter finding implies tariff binding and protectionist impacts on the bilateral agro-food exports. Finally, the regression coefficients of the similarity of institutions are significantly negative for the regulation in the exporting OECD countries and the legal system in the importing OECD countries.

Table 4. Similarity of institutions and agriculture

	government size	legal system	sound money	regulation	tariff	institute
log Distance between capitals	-0.755***	-0.741***	-0.747***	-0.692***	-0.689***	-0.686***
Contiguity	0.566***	0.603***	0.603***	0.442***	0.469***	0.458***
Language	0.291***	0.307***	0.263***	0.352***	0.364***	0.356***
RFTA	0.842***	0.903***	0.888***	0.667***	0.661***	0.656***
Agriculture	-1.700***	1.111***	2.262***	0.000***	0.000***	0.000***
Quality of institutions of exporter	0.006	0.035	0.118***	0.034	0.072	0.097
Quality of institutions of importer	0.128***	0.001	0.149***	-0.058	-0.110	0.022
Similarity of institutions	0.173***	-0.090***	0.119***	0.101***	-0.097***	0.040*
Quality of institutions of exporter*Agriculture	0.206***	-0.149***	-0.172***	0.085***	-0.163***	0.059*
Quality of institutions of importer*Agriculture	-0.045***	-0.087***	-0.150***	-0.206***	0.061	-0.169***
Similarity of institutions*Agriculture	0.150***	0.047	-0.128**	-0.153***	0.060	-0.000***
N	14616	14616	14616	14616	14616	14616
Pseudo R²	0.9068	0.9018	0.9025	0.9090	0.9087	0.9082

Note: * p<0.1; ** p<0.05; *** p<0.01. Quality of institutions represents unweighted mean value for *institute*. Exporter and importer fixed effects are included in the regression models.

Source: authors' calculations.

The regression coefficients for the similarity of institutions become significant when the regression models are additionally controlled by the agriculture dummy variable and its interaction effect with the quality of institutions (*Table 4*). While the similarity of institutions in the legal system and tariff reduces the agro-food exports, it increases with the similarity of institutions in the government size, sound money, regulation, and the composite index of the similarity of institutions. The agriculture dummy variable is, except for the government size, significantly positively associated with the agro-food exports. The sound money of the quality of institutions in exporting and importing countries and the government size in importing countries are significantly positively associated with the agro-food exports. The regression coefficients with respect to the interaction effects of the agriculture dummy variable with institutional variables show mixed results. Except for the government size, regulation, and the composite index of quality of institutions in exporting countries, the agricultural exports tend

to negatively affect the quality of institutions on agro-food exports. Yet, except for the government size, the agricultural exports tend to negatively affect the similarity of institutions on agro-food exports as well. This finding is in line with the theoretical hypothetical expectations arguing that the different types of institutions differently affect the agricultural and food exports and that the better quality of institutions and greater similarity of institutions increase the exports for more complex food products.

4.4 The Effects of Distance Conditional on Quality of Institutions

The authors of this article now turn to investigate the relationship between the trade and distance by adopting the approach proposed by Freund, Weinhold (2004). It is expected that the better institutions can overcome trade costs, which, with distance, are likely to be higher for the primary agricultural products than for the processed food products due to the difference in value per weight (e.g., tone) of the product. First, the model assumes and the empirical estimates confirm that the coefficient of distance is negative. This finding is again revealed by the empirical results in *Table 5* and *Table 6*. However, the regression coefficients change only slightly when the institutional variables are included in the models. Only the sound money in the importing OECD countries is significantly positively associated with the bilateral agro-food exports, but the legal system in exporting and importing OECD countries is significantly negatively associated with the regulation and tariff in importing OECD countries. The lower is the quality of institutions of the legal structure and protection of property rights in exporting and importing OECD countries, and more persistently the market is regulated and protected in importing OECD countries, the more difficult it is to conduct the agro-food exports. Moreover, the regression coefficients on the quality of institutions variables are sometimes insignificant. These results confirm that different institutions play different roles in agro-food exports.

Table 5. The effects of distance

	government size	legal system	sound money	regulation	tariff	institute
log Distance between capitals	-0.654***	-0.680***	-0.661***	-0.714***	-0.637***	-0.706***
log Long Distance between capitals	-2.795***	-2.310***	-2.191***	-4.630***	1.842***	-6.972***
Contiguity	0.592***	0.596***	0.608***	0.577***	0.611***	0.589***
RFTA	0.289***	0.300***	0.313***	0.220***	0.320***	0.250***
Language	0.732***	0.858***	0.878***	0.802***	0.771***	0.858***
Quality of institutions of exporter	0.050	-0.086**	-0.029	-0.025	0.070	0.072
Quality of institutions of importer	0.046	-0.068	0.097**	-0.198***	-0.190**	-0.123
Quality of institutions of exporter*log Long Distance between capitals	0.050	0.169***	0.197***	0.312***	-0.151***	0.406***
Quality of institutions of importer*log Long Distance between capitals	0.386***	0.077***	0.005	0.322***	-0.130*	0.481***
N	14616	14616	14616	14616	14616	14616
Pseudo R^2	0.8636	0.8593	0.8589	0.8630	0.8586	0.8620

Note: * $p<0.1$; ** $p<0.05$; *** $p<0.01$. Exporter and importer fixed effects are included in the regression models.

Source: authors' calculations.

The results suggest that the quality of institutions did not have strong impacts on the association between the distance and agro-food exports. Second, in order to investigate the relationship between quality of institutions and distance further the authors introduce a dummy Long Distance variable. Then, this variable on Long Distance interacts with the

quality of institutions variables for exporting and importing OECD countries and includes a set of control variables from the previous regressions. If a particular quality of institutions has reduced (increased) the effect of distance on agro-food trade, then the regression coefficient of the interaction term should be positive (negative). The regression coefficients for the interaction effect of the quality of institutions of exporter/importer countries and the Long Distance for agro-food exports, except for tariff, are positive and most significant, particularly in the case of the legal system, sound money, regulation, and the composite index of quality of institutions, which is consistent with the theoretical expectations. The empirical results of the regression coefficients for the interaction effect of the quality of institutions of exporter/importer countries and the Long Distance, except from the tariff, are positive and more often significant (*Table 6*). The regression coefficients of the interaction effect of the Long Distance and agriculture dummy variables are significantly positive. The empirical results imply that the quality of institutions with good governance has reduced, except from the tariff, the effect of Distance on both agricultural and food exports.

Table 6. The effects of distance and agriculture

	government size	legal system	sound money	regulation	tariff	institute
log Distance between capitals	-0.654***	-0.680***	-0.661***	-0.714***	-0.637***	-0.706***
log Long Distance between capitals	-2.913***	-2.428***	-2.309***	-4.748***	1.725***	-7.090***
Agriculture	-0.923***	-0.923***	-0.923***	-0.923***	-0.923***	-0.923***
log Long Distance between capitals*Agriculture	0.364***	0.364***	0.364***	0.364***	0.364***	0.364***
Contiguity	0.592***	0.596***	0.608***	0.577***	0.611***	0.589***
RFTA	0.289***	0.300***	0.313***	0.220***	0.320***	0.250***
Language	0.732***	0.858***	0.878***	0.802***	0.771***	0.858***
Quality of institutions of exporter	0.050	-0.086***	-0.029	-0.025	0.070	0.072
Quality of institutions of importer	0.046	-0.068*	0.097**	-0.198***	-0.190**	-0.123
Quality of institutions of exporter*log Long Distance between capitals	0.050	0.169***	0.197***	0.312***	-0.151***	0.406***
Quality of institutions of importer*log Long Distance between capitals	0.386***	0.077***	0.005	0.322***	-0.130**	0.481***
N	14616	14616	14616	14616	14616	14616
Pseudo R^2	0.9072	0.9029	0.9025	0.9065	0.9022	0.9055

Note: * $p<0.1$; ** $p<0.05$; *** $p<0.01$. Exporter and importer fixed effects are included in the regression models.

Source: authors' calculations.

4.5 Effects of Level of Economic Development Conditional on the Quality of Institutions

The GDPCAP as a measure of the level of economic development varies between the OECD countries. With the interaction term of the variables for the quality of institutions and GDPCAP is tested whether OECD countries with good quality of institutions and a higher level of economic development have better agro-food export performance. A positive association is expected between the good quality of institutions and the level of economic development, because OECD countries with higher GDPCAP are more likely to have better institutions than the OECD countries with lower GDPCAP. It is assumed that a high economic development reduces the necessity of a good institutional framework in the importing OECD country. The authors test this by the interaction effect of the quality of institutions of exporters/importers' countries with the GDPCAP of exporters'/importers' countries. These interaction variables are specified in the adapted gravity regression models to test empirically the effects of the level of economic development conditional with the quality of institutions on agro-food exports.

Table 7. The effects of economic development

	government size	legal system	sound money	regulation	tariff	institute
log Distance between capitals	-0.743***	-0.743***	-0.743***	-0.743***	-0.743***	-0.751***
Contiguity	0.591***	0.591***	0.591***	0.591***	0.591***	0.584***
Language	0.292***	0.291***	0.291***	0.291***	0.291***	0.317***
RFTA	0.902***	0.902***	0.902***	0.902***	0.902***	0.868***
Quality of institutions of exporter	0.843	-0.163	0.279	0.102	0.235	-2.529***
Quality of institutions of importer	-1.563***	-0.877**	-0.559	-2.001***	-1.297**	3.078***
Quality of institutions of exporter*log GDPCAP of exporter	-0.077	0.014	-0.024	-0.004	-0.018	0.279***
Quality of institutions of importer*log GDPCAP of importer	0.168***	0.086*	0.068	0.189**	0.107*	-0.306***
N	14616	14616	14616	14616	14616	14616
Pseudo R^2	0.8581	0.8575	0.8576	0.8579	0.8578	0.8581

Note: * $p<0.1$; ** $p<0.05$; *** $p<0.01$. Exporter and importer fixed effects are included in the regression models.

Source: authors' calculations.

Table 7 and *Table 8* present the results of the included proximity variables for Distance, Contiguity, Language, and RFTA, which have remained significant with the expected signs of the regression coefficients. Therefore, the focus is on the regression coefficients of the quality of institutions variables, and particularly on the interaction effects, for which the results are found to be rather mixed. This holds for the sign and significance of the regression coefficients for both agricultural and food products. This implies the different importance of the quality of institution variables that are linked to the level of economic development. The interaction effect has a positive sign, which is most significant in the model for the importing OECD countries suggesting that a high economic development reduces the impact of a good institutional quality frame in the agro-food importing OECD country. The quality of institutions of the importer OECD countries displays a negative effect on the bilateral agro-food exports when logGDPCAP is set to be equal to zero. As the logGDPCAP increases, the negative impact of quality of institutions decreases in absolute value and turns positive beyond a certain value of logGDPCAP. The positive association between the quality of institutions and the level of economic development implies the importance of the joint effect of both the level of economic development and good governance of the OECD agro-food importing countries. The regression coefficients of the agriculture dummy variable are significantly positive, while the regression coefficients of the interaction effects of the agriculture dummy variable and GDPCAP in the exporting/importing countries are significantly negative. This suggests that the agricultural exports increase agro-food exports, which have deteriorated with the higher GDPCAP in the OECD exporting/importing countries. This finding is consistent with the expectation that the share of agricultural exports in the agro-food exports declines with the higher GDPCAP, because higher value-added processed products become more important.

Table 8. The effects of economic development and agriculture

	government size	legal system	sound money	regulation	tariff	institute
log Distance between capitals	-0.743***	-0.743***	-0.743***	-0.743***	-0.743***	-0.751***
Agriculture	7.931***	8.024***	8.064***	8.048***	8.020***	8.127***
log GDPCAP of exporter*Agriculture	-0.358***	-0.366***	-0.364***	-0.364***	-0.363***	-0.375***
log GDPCAP of importer*Agriculture	-0.507***	-0.509***	-0.514***	-0.514***	-0.512***	-0.510***
Contiguity	0.591***	0.591***	0.591***	0.591***	0.591***	0.584***
Language	0.290***	0.290***	0.290***	0.290***	0.290***	0.316***
RFTA	0.903***	0.903***	0.903***	0.903***	0.903***	0.869***
Quality of institutions of exporter	0.758*	-0.247	0.189	-0.043	0.115	-2.732***
Quality of institutions of importer	-1.679***	-0.995***	-0.680	-2.211***	-1.488***	3.170***
Quality of institutions of exporter*log GDPCAP of exporter	-0.068	0.023	-0.014	0.011	-0.006	0.300***
Quality of institutions of importer*log GDPCAP of importer	0.179***	0.098**	0.082*	0.210***	0.126**	-0.315***
N	14616	14616	14616	14616	14616	14616
Pseudo R^2	0.9019	0.9013	0.9014	0.9017	0.9017	0.9019

Note: * $p<0.1$; ** $p<0.05$; *** $p<0.01$. Exporter and importer fixed effects are included in the regression models.

Source: authors' calculations.

The sensitivity of the econometric results is checked applying the out-of-sample approach. The authors have constructed a smaller sub-sample of the most developed OECD countries using a cut-off criterion with the GDPCAP higher than 20,000 US dollars. The sign of the quality of institutions variable and its interaction with the GDPCAP remains the same. In addition, in some cases, other interaction variables become significant. To conclude, the econometric results are robust and not sensitive to the small sample sizes.

Conclusion

The most recent economic and financial crisis has opened questions on the importance of institutions in economies and on the confidence between exporters and importers. In this economic context, this article has investigated the effects of quality of institutions and similarity of institutions as drivers of informal trade barriers on agro-food exports using the adapted gravity trade equation. The econometric results have confirmed that the significant role of institutional determinants on bilateral exports, which varies between the agricultural and food products. While the better quality of institutions fosters agro-food exports, the different institutions are found to have different impacts between the agricultural and food products, but also different institutions have different impacts within each product group. The better quality of institutions raises agro-food exports by lowering international transactional costs for more complex food products. The dismantling of a persistent inefficient quality of institutions in the agricultural trade, such as, agricultural trade liberalisation with the reduction or abolishing the tariff can boost both agricultural and food exports.

The main findings of this research are consistent with the studies of Méon, Sekkat (2008) for the manufacturing trade and Martincus, Gallo (2009) for the merchandise trade. First, a product type by the degree of product value added does matter in explaining the role of the quality of institutions and their effects. Consistently with the theoretical expectations, this effect is more pronounced for the higher valued food than for the primary agricultural products. Second, the quality of institution types does matter as they differently affect the agricultural and food exports. This is clearly confirmed by the empirical results that different

exports require different institutions, and different quality of institutions affects agricultural and food exports differently.

In addition, the quality of institutions with good governance has reduced the Distance effect on the agro-food exports. This finding about the role of marketing macro-environment is of particular policy relevance implying the importance of quality of institutions and similarity of institutions on the regulatory basis and in the implementation practices by lowering international trade transaction costs and, thus, increasing the agro-food exports between the analysed OECD countries. The econometric results confirm the significant positive association of agro-food exports with the economy size and the proximity parameters pertaining to Contiguity, Language, and RFTA, but also the significant negative association of the parameter pertaining to the Distance variable.

Finally, the association of bilateral agro-food exports with Distance and level of economic development are biased by the institutional determinants. The positive associations between quality of institutions with Distance and the level of economic development imply the role of good governance for agro-food exports.

References

Anderson, J.E., Marcouiller, D. (2002), "Insecurity and the Pattern of Trade: An Empirical Investigation", *Review of Economics and Statistics*, Vol. 84, No 2, pp.342-352.

Anderson, J.E., Van Wincoop, E. (2003), "Gravity with Gravitas: A Solution to the Border Problem", *American Economic Review*, Vol. 93, No 1, pp.170-192.

Anderson, J., Van Vincoop, E. (2004), "Trade Costs", *Journal of Economic Literature*, Vol. 42, No 3, pp.691-751.

Baier, S., Bergstrand, J. (2006), "The Growth of World Trade: Tariffs, Transport Costs, and Income Similarity", *Journal of International Economics*, Vol. 53, No 1, pp.1-27.

Berkowitz, D., Moenius, J., Pistor, K. (2006), "Trade, Law, and Product Complexity", *Review of Economics and Statistics*, Vol. 88, No 2, pp.363-373.

Bilkey, W. (1978), "An Attempted Integration of the Literature on the Export Behaviour of Firms", *Journal of International Business Studies*, Vol. 9, No 1, pp.33-46.

Blanchard, O., Kremer, M. (1997), "Disorganization", *Quarterly Journal of Economics*, Vol. 112, No 4, pp.1091-1126.

Bojnec, Š., Fertő, I. (2009), "Agro-Food Trade Competitiveness of Central European and Balkan Countries", *Food Policy*, Vol. 34, No 5, pp.417-425.

Bojnec, Š., Fertő, I. (2010), "Quality Differentiation in East-West European Agro-Food Trade during the Pre-Accession", *Transformations in Business & Economics*, Vol. 9, No 3(21), pp.36-51.

Brada, J.C., Mendez, J.A. (1993), "Political and Economic Factors in Regional Economic Integration", *Kyklos*, Vol. 46, No 2, pp.183-201.

Cheng I.-H., Wall, H.J. (2005), "Controlling for Heterogeneity in Gravity Models of Trade and Integration", *Federal Reserve Bank of St. Louis Review*, Vol. 87, No 1, pp.49-63.

De Groot, H.L.F., Linders, G-J.M., Rietveld, P., Subramanian, U. (2004), "The Institutional Determinants of Bilateral Trade Patterns", *Kyklos*, Vol. 57, No 1, pp.103-124.

Depken II, C.A., Sonora, R.J. (2005), "Asymmetric Effects of Economic Freedom on International Trade Flows", *International Journal of Business and Economics*, Vol. 4, No 2, pp.141-155.

Dollar, D., Kraay, A. (2003), "Institutions, Trade, and Growth", *Journal of Monetary Economics*, Vol. 50, No 1, pp.133-162.

Egger, P. (2002), "An Econometric View on the Estimation of Gravity Models and the Calculation of Trade Potentials", *The World Economy*, Vol. 25, No 2, pp.297-312.

Feenstra, R. (2004), *Advanced International Trade: Theory and Evidence*, Oxford, Princeton University Press.

Francois, J., Manchin, M. (2007), *Institutions, Infrastructure, and Trade*, Milano, Centro Studi Luca D'Agliano Development Studies Working Papers No. 224, Centro Studi Luca D'Agliano, Università degli Studi di Milano.

Frankel, J., Rose, A. (2002), "An Estimate of the Effect of Common Currencies on Trade and Income", *Quarterly Journal of Economics*, Vol. 117, No 2, pp.437-466.

Freund, C.L., Weinhold, D. (2004), "The Effect of the Internet on International Trade", *Journal of International Economics*, Vol. 62, No 1, pp.171-189.

Gwartney, J., Lawson, R. (2005), *Economic Freedom of the World: 2005 Annual Report*, Vancouver, The Fraser Institute, available at, www.freetheworld.com, referred on 12/03/2013.

Heckman, J. (1979), "Sample Selection Bias as a Specification Error", *Econometrica*, Vol. 47, No 1, pp.153-161.

Helpman, E., Melitz, M., Rubinstein, Y. (2008), "Estimating Trade Flows: Trading Partners and Trading Volumes", *Quarterly Journal of Economics*, Vol. 123, No 2, pp.441-487.

Jongwanich, J. (2009), "The Impact of Food Safety Standards on Processed Food Exports from Developing Countries", *Food Policy*, Vol. 34, No 5, pp.447-457.

Katona, K. (2005), "Real Determinants of Foreign Direct Investment: The Case of Hungary", *Transformations in Business & Economics,* Vol. 4, No 1, pp.55-76.

Levchenko, A. (2007), "Institutional Quality and International Trade", *Review of Economic Studies*, Vol. 74, No 3, pp.791-819.

Linder, S. (1961), *An Essay on Trade and Transformation*, Uppsala, Almquist and Wicksells.

Linders, G-J.M., De Groot, H.L.F. (2006), *Estimation of the Gravity Equation in the Presence of Zero Flows*, Amsterdam, Tinbergen Institute Discussion Paper, TI 2006-072/3.

Martincus, C.V., Gallo, A. (2009), "Institutions and Export Specialization: Just Direct Effects?", *Kyklos*, Vol. 62, No 1, pp.129-149.

Martin, W., Pham, C. (2008), *Estimating the Gravity Model when Trade Flows are Zero is Important*, Working Paper, Washington, DC, The World Bank.

Matyas, L. (1997), "Proper Econometric Specification of the Gravity Model", *The World Economy*, Vol. 20, No 3, pp.363-368.

McCallum, J. (1995), "National Borders Matter: Canada-U.S. Regional Trade Patterns", *American Economic Review*, Vol. 85, No 3, pp.615-623.

Méon, P.-G., Sekkat, K. (2008), "Institutional Quality and Trade: Which Institutions? Which Trade?", *Economic Inquiry*, Vol. 46, No 2, pp.227-240.

Möhlmann, J., Ederveenc, S., de Groot, H.L.F., Linders, G.-J.M. (2009), *Intangible Barriers to International Trade: A Sectoral Approach*, Amsterdam and Roterdam, TI 2009-021/3 Tinbergen Institute Discussion Paper, Tinbergen Institute, available at, http://www.tinbergen.nl/discussionpapers/09021.pdf, referred on 21/06/2014..

North, D. (1990), *Institutions, Institutional Change, and Economic Performance*, Cambridge, Cambridge University Press.

Nunn, N. (2007), "Relationship-Specificity, Incomplete Contracts, and the Pattern of Trade", *Quarterly Journal of Economics*, Vol. 122, No 2, pp.569-600.

Ranjan, P., Lee, J.Y. (2007), "Contract Enforcement and the Volume of International Trade in Different Types of Goods", *Economics and Politics*, Vol. 19, No 2, pp.191-218.

Obstfeld, M., Rogoff, K. (2000), "The Six Major Puzzles in International Macroeconomics: Is There a Common Cause?", *in NBER Macroeconomics Annual 2000*.

Olper, A., Raimondi, V. (2008), "Agricultural Market Integration in the OECD: A Gravity-Border Effect Approach", *Food Policy*, Vol. 33, No 2, pp.165-175.

Olper, A., Raimondi, V. (2009), "Patterns and Determinants of International Trade Costs in the Food Industry", *Journal of Agricultural Economics*, Vol. 60, No 2, pp.273-297.

Rauch, J.E. (2001), "Business and Social Networks in International Trade", *Journal of Economic Literature*, Vol. 39, No 4, pp.1177-1203.

Roberts, M., Tybout, J. (1997), "The Decision to Export in Colombia: An Empirical Model of Entry with Sunk Costs", *American Economic Review*, Vol. 87, No 4, pp.545-564.

Rose, A.K. (2004), "Do We Really Know That the WTO Increases Trade?", *American Economic Review*, Vol. 94, No 1, pp.98-114.

Santos Silva, J., Tenreyro, S. (2006), "The Log of Gravity", *Review of Economics and Statistics*, Vol. 88, No 4, pp.641-658.

Schuler, P. (2003), "Institutions and the Changing Composition of International Trade in the Post-Socialist Transition", paper presented at the annual conference of the *International Society of New Institutional Economics*, Budapest.

PREKYBOS ŽEMĖS ŪKIO MAISTO PRODUKTAIS INSTITUCINIAI VEIKSNIAI

Štefan Bojnec, **Imre Fertő**

SANTRAUKA

Straipsnyje aptariami institucijų kokybės ir panašumo veiksniai, lemiantys neformalios prekybos apribojimus, nustatytus dvišaliam žemės ūkio maisto produktų eksportui Ekonominio bendradarbiavimo ir plėtros organizacijos (EBPO) šalyse, pagal pritaikytą gravitacinę prekybos lygtį. Ekonometriniai rezultatai patvirtino, kad egzistuoja skirtingi institucijų panašumo ir kokybės veiksniai, darantys įtaką dvišaliam žemės ūkio maisto produktų eksportui. Skirtingos institucijos skirtingai veikia žemės ūkio ir maisto produktus bei atskiras produktų grupes. Institucijų panašumo veiksniai yra svarbūs, tačiau žemės ūkio maisto produktų eksportas skiriasi panašiose institucinėse struktūrose. Geresnės kokybės institucijos didina žemės ūkio maisto produktų eksportą, tačiau žemės ūkio ir maisto produktų ekonometriniai rezultatai skiriasi. Poveikis yra didesnis sudėtingiems maisto produktams, o ne pirminiams žemės ūkio produktams. Skirtingiems žemės ūkio produktų eksportams reikia skirtingų institucijų, o skirtingos kokybės institucijos įvairiai veikia žemės ūkio ir maisto produktų eksportus. Institucijų kokybė sumažino atstumo poveikį žemės ūkio maisto produktų eksportams. Žemės ūkio maisto produktų eksportai yra ženkliai tiesiogiai teigiamai susiję su ekonomikos dydžiu ir artimumo matais, siejamais su gretinimu, kalba, regioniniu laisvosios prekybos susitarimu, tačiau itin neigiamai susiję su atstumu. Gera institucijų kokybė sumažina atstumo poveikį, kuris kartu su aukštesniu ekonomikos plėtros lygiu importuojančiose EBPO šalyse teigiamai veikia abišalį žemės ūkio maisto produktų eksportą.

REIKŠMINIAI ŽODŽIAI: institucijos, atstumas, ekonomikos plėtra, prekyba žemės ūkio maisto produktais, gravitacinis modelis, Ekonominio bendradarbiavimo ir plėtros organizacijos šalys.