sciendo Zagreb International Review of Economics & Business, Vol. 28, No. 2, pp. 303-317, 2025

Faculty of Economics and Business, University of Zagreb and Sciendo. Printed in Croatia.
ISSN 1331-5609; UDC: 33+65
DOI: 10.2478/zireb-2025-0026
CONFERENCE PAPER

Development of the Baltic Countries' Export Network

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Abstract: *The paper combines the theories of gravity modelling and the economics of networks and empirically analyzes the development of the export network of the three Baltic countries after the collapse of the Soviet Union. We investigate which factors influenced the spread of the export networks of the Baltic countries and if the influence of any of these factors differed for Lithuania, Latvia and Estonia. We find that the network effects are important for the development of the extensive trade margin. The most important factors are the history of exporting, the distance, the ability to understand each other and the stock of migrants between the countries. Results suggest that there were no major differences between any of the countries analyzed.*

Keywords: trade; international trade; trade networks; network formation; extensive trade margin

JEL Classification: F14, D85

Introduction

When the Soviet Union collapsed, Lithuania, Latvia and Estonia once again entered the international trade market. Before their independence, these three countries had centrally planned economies, very limited cultural and economic relations with the outside world and strictly prohibitive trade restrictions. After the drop of the iron curtain, they re-entered the international trade market as free, independent countries and started to form their own trade networks.

The paper builds on this natural experiment and examines how the export network of Lithuania, Latvia and Estonia developed after their independence from the Soviet Union. We combine the gravity and networks theories and focus on the extensive

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trade margin (see Albornoz et al., 2012; Conconi, 2022; Helpman et al., 2008; Felbermayr & Kohler, 2006) to analyze how different direct and network factors influenced the formation of the export network of each of the Baltic countries. The paper seeks to determine the most important factors forming their export networks, and to examine if the influence of these factors was the same for each of these countries.

We aim to answer the following research questions:

- Which factors influenced the spread of the export network of each of the Baltic countries?
- How different was the influence of these factors for Lithuania, Latvia and Estonia?

This paper aims to empirically examine the importance of a wide range of network effects for the development of the extensive trade margin of the Baltic countries. The novelty of the research lies in including many network effects to the gravity model, and in comparing the influence of the network effects among the countries. Another novelty of the paper is that it focuses on developing markets and examines how the emerging economies form their export network, while current empirical research (e.g. Chaney, 2014; Rauch & Trindade, 2002; Felbermayr & Kohler, 2006; etc.) is based mainly on the matured markets, engaged in the international trade for several decades or even centuries (e.g. the USA, France, etc.).

The setup of the paper is as follows. In the literature review section, we analyze the latest research and its relevance to our study. In the methodological section we discuss the methodology and describe the data. Results section presents the general model for all three Baltic countries and compares the results for Lithuania, Latvia and Estonia. Finally, we conclude, address the limitations of the study and provide recommendations for future research.

Literature review

This research contributes to the literature on international trade networks and empirical gravity modelling. Since Tinbergen (1962) primary trade determinants have been demand, supply, and trade costs, whereas the most common proxy of trade costs is the distance between the countries (e.g. Tinbergen, 1962; Anderson, 1979; Anderson & Van Wincoop, 2003; Anderson, 2011; Felbermayr & Kohler, 2006). Other authors elaborated the concept of trade costs, including such trade determining factors as language skills (Ginsburgh & Weber, 2020; Egger & Toubal, 2018; Rindler, 2021; Petrylė, 2022), belonging to the currency union (Berthou & Fontagne, 2008; Baldwin & Di Nino, 2006), openness of political regimes (Kim et al., 2019; Albornoz et al., 2012), migration networks (Parsons & Vézina, 2018; Baiardi & Ammon, 2022; Zhang, 2020), social connectedness (Bailey et al., 2021), religious beliefs (Lo Turco & Maggioni, 2018), search costs (Allen, 2014) and incumbency effects (Egger el al., 2025).

Helpman et al. (2008), Chaney (2014), Chaney (2016), Chaney (2018), Morales et al. (2019), Defever et al. (2015), Fernandes & Tang (2014), Wang & Zhao (2013), Lawles (2013) and other authors started to include experience of exporting and to apply economics of networks in trade modelling. Chaney (2014), Defever et al. (2015) and Morales et al. (2019) claim that new export relations tend to be created from the places where export relations have already been created (they called it the 'network effects', 'extended gravity' factor group or 'spatial exporters'). Similar results were obtained by Berthou & Ehrhart (2017) and Chen & Sun (2021). Morales et al. (2019) argued that it is less costly to enter a new market which is similar to the market where the firm has already exported.

We build our analysis on the models developed by Chaney (2014), Defever et al. (2015), Chaney (2018) and Morales et al. (2019). We follow the assumption that the export network of a country develops stage-by-stage. In the first stage, the country of origin finds several export destinations directly. In the second and further stages, the country of origin finds more export destinations in two ways: directly from the origin, and indirectly – from its current export destinations which have already been found in the previous stages. We shall refer to the factors affecting this indirect search procedure (i.e. the factors influencing country's ability to find new export destination not directly from the origin, but from the current export destinations of a country), as the 'network effects', 'indirect effects' and/or 'friends-of-friends' effects.

Methodology

The model

Following Chaney (2014), we assume that the spread of the export markets depends on the trade costs and on the import growth. Trade costs and import growth are evaluated between the origin and the destination countries (we call them direct effects), and between the current destination of the country of origin and its new destination (we call them indirect effects). As proxies of the trade costs we include the direct and the indirect versions of common spoken languages, free trade agreements, belonging to the same economic and political unions and the stock of migrants. We attempt to test which direct and indirect effects were the most important for the development of the extensive margin of international trade in Lithuania, Latvia and Estonia, and if their influence differed for the three Baltic countries.

In order to examine the factors that are important for the export network formation, the following dynamic gravity-type model was estimated:

$$1\left[Export^{s}_{i,c,t+1} > 0 \right] = \alpha\, Markets^{s}_{i,t} + \beta_1 \mathbf{X}^{s}_{\underset{(direct)}{i,c,t}} + \beta_2 \mathbf{X}^{s}_{\underset{(fof)}{i,c,t}} + \\ + \delta\, 1\left[Export^{s}_{i,c,t} > 0 \right] + Controls^{s}_{c,t} + \varepsilon^{s}_{i,c,t} + u^{s}_{i,c} \tag{1}$$

Here, 1[.] is an identity function indicating if product i from the country of origin s was exported to country c at time t. $Markets^{s}_{i,t}$ shows the number of country s export markets of product i at time t. Vectors X stand for all the factors influencing the direct search procedure (these are the factors which condition expanding the country's export network directly from the country of origin, e. g. the number of emigrants from the country of origin to country c) and all the factors influencing the indirect search procedure (these are the factors which condition expanding the country's export network from the current export partners of the country of origin, e. g. the average number of emigrants from the current export partners of the country of origin to country c). The controls stand for any additional controls needed (i.e. the size of the economy of a destination country, the industry dummy, etc.). Finally, ε is an error term and u is the individual effect.

Exogenous variables are as follows:

- Nominal GDP (in logs) of the destination country in millions USD
- Previous exporting shows if product i was exported from the country of origin to the country of destination in year t
- The number of export markets give the number of product's i export markets that country of origin had in previous year
- Import growth shows this year's growth of the total import to destination country
- Import growth f-o-f gives this year's total growth of import of the destination country from all the countries in which the country of origin exported product i, as of

$$impgrow\_fof_{i,c,t} = ln\left(\sum_{c'} Export^{s}_{i,c',t} * Import^{c'}_{c,t}\right) - ln\left(\sum_{c'} Export^{s}_{i,c',t-1} * Import^{c'}_{c,t-1}\right) \quad (2)$$

- Distance from the origin is calculated as the log of the distance between the country of origin and the destination country
- Distance f-o-f indicates the mean of the distances between any destination country c and all the other countries to which the origin exported product i.

$$dist\_fof_{i,c,t} = \frac{\sum_{c'}(lndistance_{c,c'} * Export^{s}_{i,c',t})}{\sum_{c'} Export^{s}_{i,c',t}} \quad (3)$$

- Soviet bloc membership is a dummy variable and stands for cultural and historical similarities. It can be either '1' (both countries belonged to the Soviet bloc before 1990) or '0' otherwise. We included a country to the Soviet bloc if that country was considered to belong to the Soviet bloc before the 1990s. The countries included in the Soviet bloc in the analysis are: Lithuania, Latvia, Estonia, Moldova, Ukraine, Belarus, Hungary, Poland, Romania, Slovakia, the Czech Republic, Bulgaria, Russia, Armenia, Azerbaijan, Georgia, Kazakhstan,

Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan, Afghanistan, Vietnam, Mongolia, Laos, Mozambique, Yemen, Ethiopia, Cuba, North Korea, Benin, Angola and the Republic of Congo.

- Soviet bloc f-o-f membership is another dummy variable and indicates the indirect effect of belonging to the Soviet bloc.

$$sb\_fof_{i,c,t} = \frac{\sum_{c'}(sb_{c,c'} * Export^{s}_{i,c',t})}{\sum_{c'} Export^{s}_{i,c',t}} \tag{4}$$

- EU membership can be either '1' if both countries belong to the European Union and it equals '0' otherwise. The EU membership is accounted for each year.
- EU f-o-f membership indicates the indirect effect of belonging to the EU and is calculated as follows

$$eu\_fof_{i,c,t+1} = \frac{\sum_{c'}(eu_{c,c',t+1} * Export^{s}_{i,c',t})}{\sum_{c'} Export^{s}_{i,c',t}} \tag{5}$$

- Free trade agreements (FTA) are accounted for each year and amount to '1' if both countries had a free trade agreement at the time, otherwise it is '0'.
- FTA f-o-f shows the average of free trade agreements between the export partners of the origin and the destination country:

$$fta\_fof_{i,c,t+1} = \frac{\sum_{c'}(fta_{c,c',t+1} * Export^{s}_{i,c',t})}{\sum_{c'} Export^{s}_{i,c',t}} \tag{6}$$

- Language is a measure of common spoken languages, taken from the CEPII database. It shows the abilities of two countries to understand and to communicate with each other.
- Language f-o-f shows the average of the indirect ability of countries to communicate. It is calculated as follows:

$$lang\_fof_{i,c,t} = \frac{\sum_{c'}(lang_{c,c'} * Export^{s}_{i,c',t})}{\sum_{c'} Export^{s}_{i,c',t}} \tag{7}$$

- Migration is the log of the migration stock from the country of origin to the destination country in 1990.
- Migration f-o-f is the log of the average indirect migration calculated for the destination country:

$$migr\_fof_{i,c,t} = \frac{\sum_{c'}(migr_{c,c',1990} * Export^{s}_{i,c',t})}{\sum_{c'} Export^{s}_{i,c',t}} \tag{8}$$

As this paper deals with an extensive margin of international trade, we are interested only in the fact whether a country of origin exported product i to the destination country, or not. The exact volume of such exports is irrelevant for the analysis.

We estimate each model applying the Linear Probability (OLS) method. According to the common practice (Shepherd, 2012), the general model was estimated including the pairs of combined country-year fixed effects. The robustness check was made by estimating the models with combined destination-product as well as combined year-product fixed effects. Separate country-by-country models were estimated including combined year-product fixed effects. To have better predictions and to reduce autocorrelation and endogeneity problems by catching some of the omitted variables, we also include the lagged export (it shows the persistence of export) to the regression (Hinz et al., 2020). To minimize the risk of other potential discrepancies, we also apply clustering and robust standard errors.

The data

The main product level bilateral trade data comes from the BACI world trade database (Mayer & Zignago, 2011) and covers the period between 1995 and 2015. The year 1995 was chosen because it is the first year when trade statistics for the Baltic countries started to be collected. The year 2015 was the final analyzed period because in this paper we are mostly interested in the beginning of the formation of the countries' export network. The data accounts export only if its value is at least 1,000 USD per year.

The model we are using is mostly designed for the firm-level data, however, we were unable to get a micro-level data for the Baltic countries. Therefore, based on Baldwin & Di Nino (2006), we are using the most detailed sector-level dataset. Trade is classified according to HS-92 6-digits classification which is the lowest possible aggregation distinguishing about 5000 commodities (Gaulier & Zignago, 2010).

The aggregated bilateral import data by country is taken from Feenstra (2005). The nominal GDP and migration data comes from the World Bank's database. The migration data is represented by the immigrant stock in the destination country by each country of origin as of the year 1990. We do not have any later migration data, however, based on Baiardi & Ammon (2022) and Bailey et al. (2021), the effects of migrants on trade do not fade even in the long run. Finally, the data for the weighted average distances between countries, the measure of common spoken languages between a pair of countries as of the year around 2012, and free trade agreements (FTA) between different countries (based on the information provided by the WTO) are retrieved from CEPII (Mayer & Zignago, 2011).

In total we have 3 countries of origin (Lithuania, Latvia and Estonia), 184 countries of destination, 20 time periods and 2472 distinct products exported by any of the 3 Baltic countries. As not all the products were exported to all the countries in all time periods, together these 4 dimensions give us around 19 million observations.

Descriptive statistics

Table 1 gives descriptive statistics of all the variables before normalization. Both exporting variables are endogenous and can be either '0' or '1'. They show if the country of origin exported product i to the destination country. The direct variables of the Soviet bloc membership, the EU membership and the free trade agreements are dummy variables. The indirect variables of the Soviet bloc membership, the EU membership, the free trade agreements and the common spoken languages are calculated as the averages, hence, they can take any value between '0' and '1'.

Table 1: Descriptive statistics

Variable	Mean	St. dev.	Min	Max
$Exporting_{t+1}$	0.056	0.231	0.000	1.000
$Exporting_t$	0.053	0.225	0.000	1.000
$Markets_t$	9.825	8.806	0.000	114.000
GDP (ln)	9.851	2.492	2.512	16.674
Import growth	0.080	0.271	-3.365	4.063
Distance (origin)	8.472	0.876	4.691	9.754
Soviet bloc	0.163	0.369	0.000	1.000
EU membership	0.078	0.267	0.000	1.000
FTA	0.219	0.414	0.000	1.000
Language	0.161	0.203	0.000	0.961
Migrants (ln)	2.046	2.974	0.000	11.785
Imp. growth f-o-f	0.082	0.771	-14.819	16.332
Distance f-o-f	8.531	0.741	2.134	9.886
Sov. bloc f-o-f	0.087	0.223	0.000	1.000
EU membership f-o-f	0.057	0.179	0.000	1.000
FTA f-o-f	0.185	0.296	0.000	1.000
Language f-o-f	0.158	0.178	0.000	1.000
Migrants f-o-f (ln)	5.342	3.772	0.000	15.466

Due to a large number of variables, there is a high possibility of multicollinearity problems. Many direct variables are correlated with the corresponding indirect variables. It is especially true for the Soviet bloc, the EU, FTA and language variables. The direct migration variable is also correlated with the direct language variable. The distance from the origin is correlated with direct migration as well as the indirect EU and FTA variables. We addressed the possible problem by estimating separate models for the direct and indirect variables and comparing their results.

The results

The general Baltic countries model

First, we estimate a general OLS model for all three countries. Following the literature, we estimate fixed effects regressions taking three types of individual effects. The first regression is estimated with year and product fixed effects, the second one with year and destination fixed effects and the third one with a pair of combined fixed effects year-destination and year-origin.

The results of the three models are given in Table 2. Almost all the factors are reported to be highly significant. As expected, the GDP, the number of markets, the previous exporting, the EU membership, the common spoken languages and the number of migrants affect the future exporting positively, while the effect of the distance from the origin is negative. The effect of the growth of imports is not significant. Some of the network factors tend to change signs by specification. The reason for that could be that although the influence of the direct factors is the same, however the influence of the network factors is different for all three Baltic countries.

Table 2: Results of the model for all three Baltic countries

Variables, normalized	**All 3 Baltic countries**		
Dependent variable	**Exp_{t+1}**	**Exp_{t+1}**	**Exp_{t+1}**
GDP	0.006*** (0.000)	0.005*** (0.000)	-
Distance (origin)	-0.018*** (0.000)	-0.012*** (0.000)	-0.037*** (0.000)
$Exporting_t$	0.133*** (0.000)	0.121*** (0.000)	0.120*** (0.000)
$Markets_t$	0.015*** (0.000)	0.017*** (0.000)	0.022*** (0.000)
Import growth	0.000*** (0.000)	0.000*** (0.000)	-
Soviet bloc	-0.008*** (0.000)		-
EU membership	0.007*** (0.000)	0.010*** (0.000)	0.061*** (0.000)
FTA	-0.001*** (0.000)	-0.002*** (0.000)	-
Languages	0.026*** (0.000)	0.053*** (0.000)	0.046*** (0.000)
Migrants	0.016*** (0.000)	0.039*** (0.000)	0.028*** (0.000)
Distance f-o-f			0.035*** (0.000)
Imp. growth f-o-f	0.000*** (0.000)	0.000*** (0.000)	0.000 (0.000)

Variables, normalized	All 3 Baltic countries		
Dependent variable	**Exp_{t+1}**	**Exp_{t+1}**	**Exp_{t+1}**
Sov. bloc f-o-f	0.003*** (0.000)	-0.001*** (0.000)	0.004*** (0.000)
EU f-o-f	0.003*** (0.000)	0.000*** (0.000)	0.006*** (0.000)
FTA f-o-f	-0.002*** (0.000)	0.005*** (0.000)	0.014*** (0.000)
Language f-o-f	-0.008*** (0.000)	0.006*** (0.000)	0.007*** (0.000)
Migrants f-o-f	0.000*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)
Constant	yes	yes	yes
Fixed effects	year, product	destination, product	year-dest, year-origin
Sector controls	no	no	no
R-squared	0.519	0.537	0.542
Observations	19,123,120	19,123,120	19,123,120

* Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Comparisons of the results for Lithuania, Latvia and Estonia

Next, we investigate the differences between the three Baltic countries. Table 3 includes three types of OLS regressions with fixed effects of year and product for each country separately. The first three columns show the results of the regressions for Lithuania, Latvia and Estonia including all the factors. To check if the results are affected by multicollinearity, we also introduced separate models, taking only direct (the second three columns) and only indirect (the last three columns) variables. As all three models give very similar results which are in line with the expectations, we may conclude that the multicollinearity problem does not have any significant impact on the results.

The results of country-by-country regressions show very similar results to the general regression: the effects of the GDP, the previous exporting, the number of markets the EU membership, the common spoken languages, the stock of migrants, indirect factors of belonging to the Soviet bloc and the EU and indirect migration are stable, significant and influence extensive margin of export positively, while both direct and indirect distance, belonging to the Soviet bloc and both direct and indirect free trade agreements have negative effects for the spread of the export markets. Import growth does not seem to have any significant influence on the formation of the export network of any of the three countries.

The negative effect of the belonging to the Soviet bloc could be explained by the increasing orientation of Lithuania, Latvia and Estonia to the EU markets. While the negative sign for the free trade agreements and changing signs for the indirect languages could be related to their correlation with the other variables.

Table 3: Results of country-by-country models

	General regressions			Direct regressions			Indirect regressions		
Variables, normalized	**Lithuania**	**Latvia**	**Estonia**	**Lithuania**	**Latvia**	**Estonia**	**Lithuania**	**Latvia**	**Estonia**
Dependent variable	**Exp_{t+1}**	**Exp_{t+1}**	**Exp_{t+1}**	**Exp_{t+1}**	**Exp_{t+1}**	**Exp_{t+1}**	**Exp_{t+1}**	**Exp_{t+1}**	**Exp_{t+1}**
GDP	0.010*** (0.000)	0.005*** (0.000)	0.005*** (0.000)	0.010*** (0.000)	0.005*** (0.000)	0.005*** (0.000)	0.014*** (0.000)	0.010*** (0.000)	0.011*** (0.000)
Distance (origin)	-0.014*** (0.000)	-0.018*** (0.000)	-0.018*** (0.000)	-0.016*** (0.000)	-0.017*** (0.000)	-0.019*** (0.000)			
$Exporting_t$	0.139*** (0.000)	0.128*** (0.000)	0.128*** (0.000)	0.140*** (0.000)	0.128*** (0.000)	0.130*** (0.000)	0.150*** (0.000)	0.137*** (0.000)	0.139*** (0.000)
$Markets_t$	0.012*** (0.000)	0.010*** (0.000)	0.010*** (0.000)	0.011*** (0.000)	0.010*** (0.000)	0.008*** (0.000)	0.009*** (0.000)	0.009*** (0.000)	0.007*** (0.000)
Import growth	0.001*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.001*** (0.000)	0.000*** (0.000)	0.001*** (0.000)			
Soviet bloc	-0.007*** (0.000)	-0.007*** (0.000)	-0.007*** (0.000)	-0.002*** (0.000)	-0.004*** (0.000)	-0.006*** (0.000)			
EU membership	0.005*** (0.000)	0.008*** (0.000)	0.008*** (0.000)	0.010*** (0.000)	0.010*** (0.000)	0.007*** (0.000)			
FTA	-0.004*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.002*** (0.000)	-0.003*** (0.000)	-0.003*** (0.000)			
Languages	0.035*** (0.000)	0.024*** (0.000)	0.024*** (0.000)	0.026*** (0.000)	0.017*** (0.000)	0.013*** (0.000)			
Migrants	0.012*** (0.000)	0.014*** (0.000)	0.014*** (0.000)	0.014*** (0.000)	0.015*** (0.000)	0.018*** (0.000)			
Distance f-o-f							-0.012*** (0.000)	-0.012*** (0.000)	-0.015*** (0.000)
Imp. growth f-o-f	0.000** (0.000)	0.000 (0.000)	0.000*** (0.000)				0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Sov. bloc f-o-f	0.004*** (0.000)	0.003*** (0.000)	0.003*** (0.000)				0.009*** (0.000)	0.006*** (0.000)	0.003*** (0.000)
EU f-o-f	0.008*** (0.000)	0.002*** (0.000)	0.002*** (0.000)				0.011*** (0.000)	0.009*** (0.000)	0.007*** (0.000)
FTA f-o-f	0.002*** (0.000)	-0.002*** (0.000)	-0.002*** (0.000)				-0.000*** (0.000)	-0.002*** (0.000)	-0.002*** (0.000)
Language f-o-f	-0.010*** (0.000)	-0.007*** (0.000)	-0.007*** (0.000)				0.016*** (0.000)	0.014*** (0.000)	0.012*** (0.000)
Migrants f-o-f	0.000 (0.000)	0.001*** (0.000)	0.001*** (0.000)				0.003*** (0.000)	0.004*** (0.000)	0.003*** (0.000)
Constant	0.063***	yes	yes	yes	yes	yes	yes	yes	yes
Ind. effects (prod, year)	fixed	fixed	fixed	fixed	fixed	fixed	fixed	fixed	fixed
Sector controls	yes	yes	yes	yes	yes	yes	yes	yes	yes
R-squared	0.531	0.51	0.523	0.529	0.506	0.518	0.517	0.495	0.506
Observations	7,338,104	5,174,080	6,610,936	7,338,104	5,174,080	6,610,936	7,338,104	5,174,080	6,610,936

* Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

A graphic comparison of the general regression results for Lithuania, Latvia and Estonia is presented in Figure 2. Coefficients are comparable, because the data has been normalized. The results are displayed starting from the highest and finishing with the lowest values.

Figure 1: Comparison of the general regression coefficients for the three Baltic countries

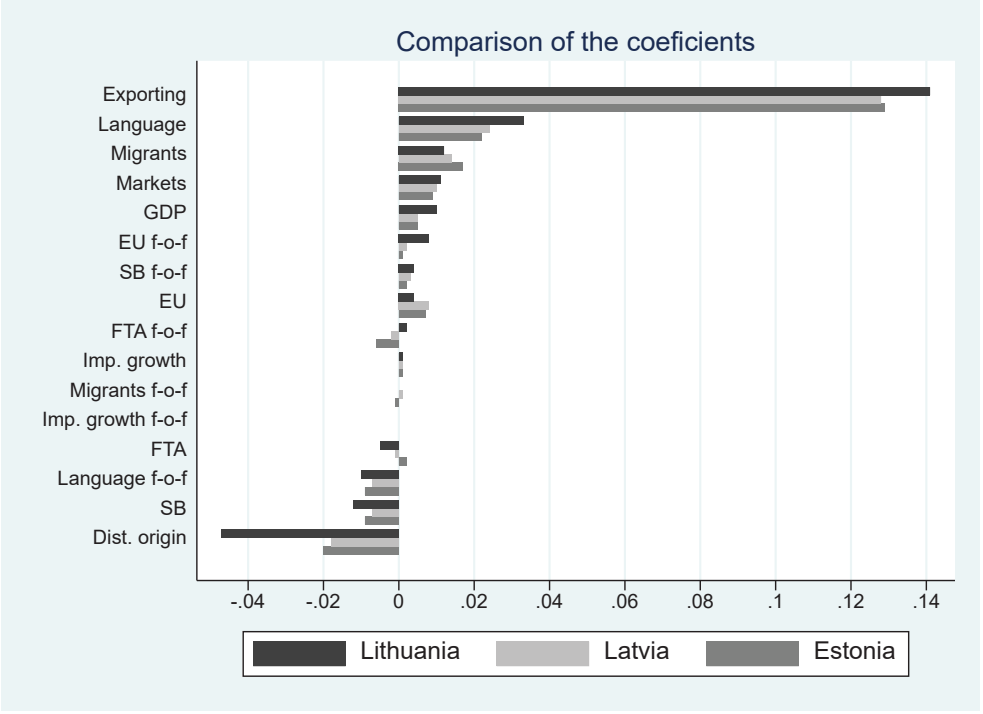

Figure 1 shows that the factors that influenced the formation of export networks of the three Baltic countries were similar. The most influential positive factors for all the countries were the previous exporting, the direct language, the direct stock of migrants, the number of current export markets and the GDP. The most influential negative factors for the three countries were the distance from the origin, the indirect language factor and the direct belonging to the Soviet bloc. The results show that the Baltic countries chose their new export markets mainly based on the closeness, export experience and the knowledge of other markets (if there has already been an export history with that destination), economic factors (if that market is economically strong) and the ease of communicating with the other country. All three Baltic countries showed clear signs of their export diversion from the Soviet bloc and the integration to the EU market.

Among the major differences between the three countries was comparably higher influence of previous export, distance from the origin and direct common spoken languages for the formation of the export network of Lithuania. For the build-up of the Estonia's export network the indirect belonging to the free trade agreements had comparably higher negative influence.

Conclusions

This paper employs the theories of gravity modelling and network economics and empirically investigates the factors influencing the formation of the export network of the three Baltic countries during the years 1995-2014.

Our findings confirm the results of Morales et al. (2019), Chaney (2014) and Albornoz et al. (2012), who found out that the network variables are important for the spread of countries' export networks. We claim that the factors that influenced the growth of the export networks of Lithuania, Latvia and Estonia positively were previous exporting, common spoken languages, the stock of migrants in other countries, the number of export markets, the GDP of the origin and both direct and indirect belonging to the EU. The increase of the number of export markets of the Baltic countries was influenced negatively by the distance from the origin, common spoken languages between the current export markets of the origin and the other countries, as well as belonging to the Soviet bloc. We didn't find any significant differences between the three countries; hence we claim that the importance of the factors that influenced the development of their export networks was very similar.

Our empirical findings help us to understand the factors that are influential for the development of a country's export network. The model could be used for researchers when constructing their own trade models and our results could indicate policy makers were to divert resources and which areas of the countries' economies should be strengthened.

While this study is limited to only 3 exporting countries and extensive trade margin, expanding the analysis to include more trading pairs, investigating the intensive trade margin, modelling product diversity, and incorporating potential intermediaries could provide valuable new perspectives and deeper insights into the topic.

Declarations

Funding

This project has received funding from the Research Council of Lithuania (LMTLT), agreement No S-PD24-92.

Conflicts of interest/Competing interests

There is no conflict of interest/Competing interests

Availability of data and material

The data that support the findings of this study were retrieved from the openly accessible websites listed in the paper.

Code Availability

The results of the STATA data analysis are shared through the tables in the manuscript.

Authors' Contributions

Not applicable.

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