International Research Journal of Multidisciplinary Scope (IRJMS), 2025; 6(3):284-295 IRJMS

Original Article | ISSN (O): 2582-631X DOI: 10.47857/irjms.2025.v06i03.04676

Analysing Developing Countries' Export Potential: Insights from the Gravity Model and PPML Methodology for the Case of Kosovo

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Abstract

The Gravity model is considered as one of the most important models in foreign trade, respectively in exporting power, to explain the main determinants of exported goods and the competitive situation towards other countries. This paper aims at showing the export potential of Kosovo with transition countries, in order to explain the bilateral flow of trade determined by- GDP, population and distance. In addition to these variables, this research has also considered other variables such as border proximity, colonial ties, common language, level of corruption and institutional quality. The main findings of this study suggest that the flow of the exports increases with the increase of economic size while distance is presented as a highly influential variable, i.e., geographical proximity affects the export dynamics where with increasing distance the export flow also decreases. Also, other variables such as colonial ties, common language and common past in a socio-political system make Kosovo's exports oriented towards Albania, Montenegro, Bosnia and Herzegovina and Macedonia. In addition to over-exploiting Kosovo's export potential with neighbouring countries, Kosovo does not fare well with other transition countries with which it has not used enough where one of the recommendations in this paper provides that Kosovo should create promotional policies in other countries to improve the export balance with those countries such as: Bulgaria, Romania, Estonia, Malta, etc.

Keywords: Economy, Exports, Gravity Model, Gross Domestic Product (GDP), Transition Economies.

Introduction

The transition from socialism to a free market economy at the close of the 20th century marks a crucial chapter in global economic history, comparable in significance to the era of industrialization. This shift, primarily characterized by the dissolution of communist regimes, ushered in a wave of high expectations for rapid economic growth through the establishment of market economies across transitioning nations. During this transformative period, efforts were primarily directed towards achieving macroeconomic stability and undertaking microeconomic restructuring, alongside sweeping institutional and political reforms (1). The transition was not without its challenges; transitioning countries grappled with rising unemployment, necessary fiscal policy reforms, significant trade deficits, extensive price inflation and a stifling of entrepreneurial ventures. Despite these hurdles, transitioning countries, notably those in Central and Eastern Europe, have seen a marked increase in exports towards developed economies, suggesting a relative success in managing economic transitions compared to other regions (2). Kosovo, as a small and emerging economy, is currently navigating its phase of economic transition, striving towards full integration into the global market economy through comprehensive legal reforms and market liberalization (3). Despite being characterized as a dynamic, new economy with a focus on accelerating growth and expanding export capacities, Kosovo confronts substantial challenges. Its strategic aim to overcome a significant trade deficit through trade liberalization and market integration has yet to yield the anticipated outcomes. Kosovar producers face considerable difficulties in penetrating foreign markets, primarily due to pervasive non-tariff barriers, while the influx of foreign investments remains minimal due to an unfavourable business environment (4).

(Received 27th March 2025; Accepted 25th June 2025; Published 20th July 2025)

Economically, Kosovo is handicapped by its minimal export potential, primarily constrained by insufficient internal economic development, underdeveloped production capacities, and an industry that is unable to satisfy domestic consumption needs. This deficiency is exacerbated by a reliance on imports, which accounted for approximately 45% of the Gross Domestic Product, thus significantly deepening Kosovo's trade deficit (5). The post-war period from 2000 to 2003 highlighted this imbalance, with exports totalling merely 72.2 million Euros against imports valued at 2.9 billion Euros, culminating in a staggering trade deficit of 2.8 billion Euros (6). This scenario underscores the critical need for a strategic re-evaluation of Kosovo's economic policies to enhance its export sector and reduce its dependency on imports. In Figure 1, are presented the date regarding the trade balance of Kosovo for the period 2001-2023 in millions of Euros. The figure clearly expresses the trade deficit of Kosovo during the whole period and which is significantly deepening.

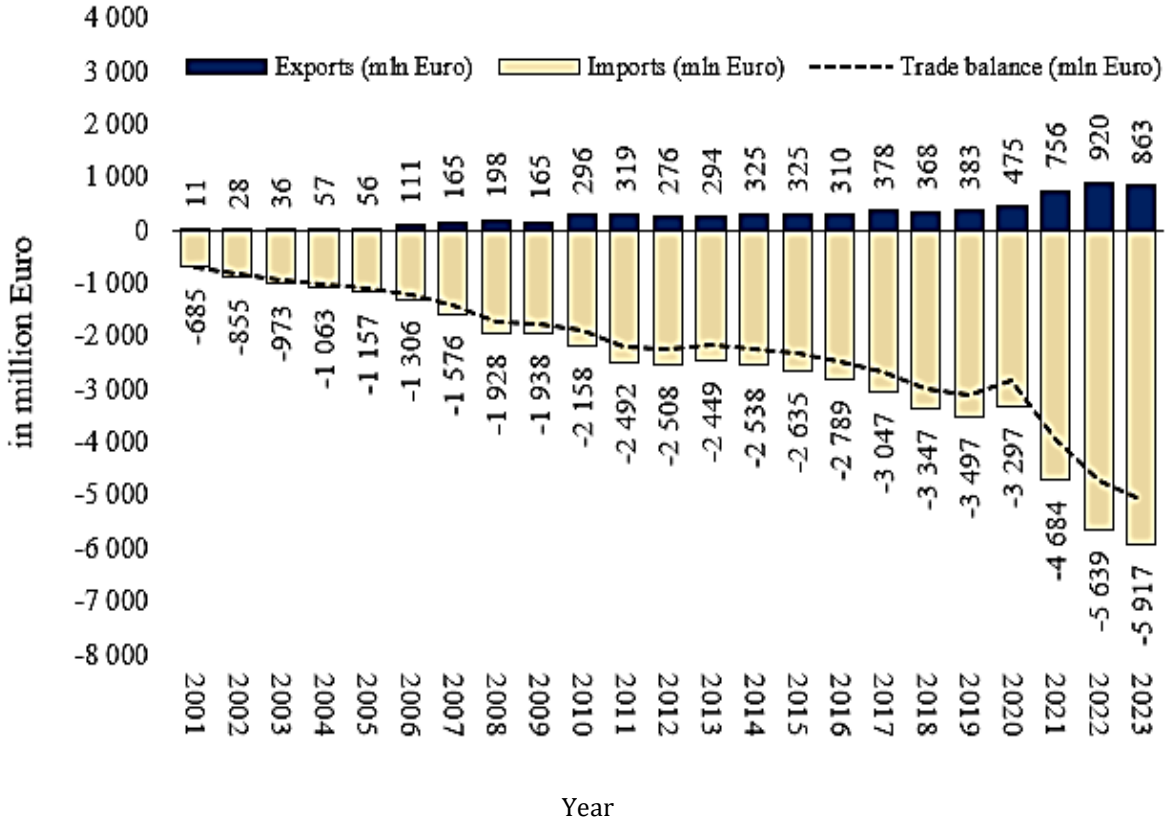

Figure 1: Kosovo's Trade Balance in mil Euro, 2001-2023

The relationship among economic growth, exports and imports, for the case of 13 transition countries was analysed also in other studies (7). Their findings suggest that from economic growth to exports, there is a unidirectional causality. The empirical findings suggest that the growth-led export hypothesis is valid in those countries and that growth is shaped more by the increase in import demand. Similarly, in another study was suggested that synchronised efforts of stabilization and liberalization are very important for the early exports success in some transition economies of Europe and Central Asia (8). In addition, they suggest that trade performance cannot improve through the liberalization of the foreign trade regime or though the devaluation of the currency unless there is deregulation in the domestic prices, or there is reduced expectation for inflation or relaxed administrative control. As export control can result in high level of protection that makes the domestic producers be isolated from international markets, removing the control of exports is seen more prioritized over easing import controls.

The Western Balkan countries were effects by war in 1990s, which made their economics face high level of deindustrialization, high level of

unemployment together the political instability and ethnical and regional division, made these countries be pushed into the European "super-periphery" (9). As these countries could not be integrated into the international trade, the balance of payments deepened its deficit even more.

Limited international capital inflows — mainly due to high country risk — have hampered technological progress and undermined competitiveness at global level. A discouraging environment for entrepreneurship in manufacturing has limited the opportunities for small and medium-sized enterprises (SMEs) to entry in international markets which in the other hand, has contributed to the growth of informal economy. In some cases, countries have transformed into economies that export labour, which means they are characterized by significant migration of labour force abroad for employment. As a result, economic progress is largely dependent on a low-skilled workforce.

In addition, the export earnings are declining together with foreign direct investments as well as labour remittances due to the current global crisis. As the transition process has accompanied these countries over many years, has led to grown level of inequalities between urbanized cities and rural regions, while limited administrative capacity has obstructed the implementation of effective local development strategies to address these effects. Relying solely on locally driven development is insufficient for deeper integration into the global economy. As a result, the countries of the Western Balkan region could not benefit from the most advantageous aspects of globalization, but they have been left to deal with its negative consequences. Without an accelerated process to EU membership, regional inequalities are likely to intensify, making the region to continue to be considered the European "super-periphery" for a longer time.

Also for the case of Slovenia and Estonia, as small and export oriented countries, are investigated the export-led growth hypothesis. For these two countries was employed the Johansen co-integration test and the Granger causality test in order to investigate the exports, imports and gross domestic product (GDP) by the use of time-series variables. In both countries was suggested granger causality between the two variables of interest: export growth and economic growth (proxied by GDP) as such supporting the hypothesis of export-led growth for both countries (10). Slovenia and Estonia by offering a more empowering environment for exporters and through market expansion can increase their economic growth (10).

The countries of the Western Balkan are still lagging behind for more than 20 years now, even though they are considered with promising business potential together with good regional trade partner, which have led significant progress in political, institutional and socio-economics aspects in these countries. Trade distortions are considered as the main cause of these problems.

Regional integration was seen as a strategy to increase the region's competitiveness in view of EU accession and globalization. However, this integration has largely been limited to regional trade agreements with the EU, while trade between countries within the region remains weak. Many governments have maintained trade barriers within the region to preserve customs revenues and have instead prioritized trade with the EU. This strategy has had limited results: foreign direct investment (FDI) and exports have increased mainly in low-cost industries such as textiles, metals and mining, which rely on cheap labour or natural resources. Few domestic companies have been able to access EU markets due to financial constraints and inability to meet high production standards for value addition.

Nevertheless, there are indications that intra-regional trade holds considerable potential both for the countries involved and for the sectors. Trade with neighbouring countries could revitalize local businesses struggling with outdated technology, high debt and low productivity. Restoring trade links that have been disrupted by wars could meaningfully expand cross-border trade and support the sustainability of regional businesses. The persistent barriers to cross-border trade between countries highlight the economic weakness of regional integration in the Western Balkans. However, from a socio-cultural perspective, shared historical experiences, common goals and the pursuit of peaceful coexistence provide a strong foundation for cross-border business cooperation. This perspective provides an analytical lens that takes into account the unique post-conflict socio-cultural and political

context of the Western Balkans, which is often overlooked by conventional economic analysis.

Methodology

This study explores the effects of Kosovo's trade exchanges with transitioning countries using a robust methodological framework combining advanced econometric, descriptive, explanatory, and causal research methods. Initially, the research reviews existing literature to frame the problem and theoretical solutions. It then constructs a framework using causal methods to identify cause-effect relationships, followed by applying the gravity trade model to analyse trade dynamics empirically. The results are discussed in context with other studies, providing actionable recommendations for stakeholders and policymakers. The gravity trade model, recognized for its efficiency in analysing international trade, compares Kosovo's export potential with transitioning countries' economic size (GDP) and bilateral distances. The model incorporates additional variables like income differentials, exchange rates, inflation, and institutional quality, plus dummy variables for proximity, trade agreements, and cultural ties (11, 12). Empirical implementation involves collecting secondary data from 2005 to 2015, verifying, coding, and tabulating this using STATA software, drawing from both national and international sources to ensure reliability. This approach ensures a comprehensive analysis of Kosovo's trade dynamics with transitioning economies (13, 14). The gravity model, historically evaluated with cross-sectional data, faces criticism for potentially biased outcomes due to inadequate control of country-specific heterogeneity (15). Originally inspired by Newton's 17th-century law of gravitation, which describes the attractive force between bodies based on mass and distance, the model was adapted by social scientists in the 19th century to analyse flows and transfers between different entities (10). In trade, the model incorporates not only traditional distance measures but also variables like common language, shared borders, and free trade agreements to capture various bilateral trade facilitators (16). Distance remains a critical variable for several reasons as articulated by other authors (17). It represents a direct cost, indicates the time goods spend in transit (affecting particularly perishable items), and reflects synchronization and transaction costs that grow with increased distance. Additionally, geographical distance often correlates with cultural distance, which can complicate trade by affecting communication and negotiation styles. This nuanced understanding is crucial for conducting thorough empirical research using the gravity trade model, enhancing its relevance and accuracy in capturing the complexities of international trade dynamics (18, 19).

In this study, is going to be used the Poisson pseudo-maximum likelihood (PPML) method to estimate the gravity trade model (20). The PPML estimator is well-suited for handling zero trade values and is robust against various forms of heteroscedasticity (21). It offers significant advantages for analysing trade flows, as it directly estimates trade volumes instead of their logarithms, thus avoiding the underestimation of large trade volumes and addressing zero trade flows effectively through its multiplicative form. Additionally, the PPML estimator naturally incorporates observed heterogeneity and consistently demonstrates lower bias compared to other estimators, making it a reliable and accurate tool for the econometric analysis of international trade flows. This method significantly enhances the robustness of the gravity model's application in empirical research (22). As mentioned above, the estimation of the gravity model is often complicated by heteroscedasticity and the presence of zero trade flows, which can lead to biased results when using traditional log-linear OLS estimators. Thus, if a log-linearized gravity model is used and heteroscedasticity is present, then the OLS method is not suitable as it leads to inconsistent estimates, since the use of the logarithmic functional form of trade flows changes the error structure (19). Moreover, the logarithm of zero values is undefined when zero values are present in the data, so that the observations with zero values are excluded. On the other hand, these observations are very meaningful for the economic development of a small country like Kosovo. For all the reasons mentioned, this paper employs the Poisson Pseudo-Maximum Likelihood (PPML) estimator as a methodology that can deal with zero trade values by modelling the trade flows in levels rather than logs. The PPML estimator can deal with heteroscedasticity and is able to produce

consistent estimates and avoids the biases introduced by log-linearization. While PPML does not fully solve endogeneity—particularly in the case of reverse causality between trade and GDP—it mitigates related biases by controlling for heteroscedasticity and allowing for a more robust treatment of the multiplicative structure of the gravity equation. As a result, in order to enhance the reliability of this paper's empirical results, is going to be employed the PPML methodology.

In this study, for the employment of the gravity model, will be used secondary data which are collected, checked, coded, and tabulated from various national and international sources. The main data sources are: Kosovo Agency of Statistics (KAS), World Bank, UNCTAD, European Bank for Reconstruction and Development (EBRD) and other sources. These data will be adjusted and adapted according to the panel format. Since the panel format data uses data information in different time periods, an advantage which in this study will be used in the data for comparing the export potential of countries in transition which will include the period from 2005-2019. The PPML is a very adventurous methodology as it can deal with data sets that may contain a large proportion of zero values, which is also the case for the Kosovo trade data (1, 19). Finally, the measurement of the gravity trade model will be carried out using STATA software.

The basic form of the gravity model is expressed as:

$$T_{ij} = \beta_0 \frac{GDP_i^{\beta_1}\, GDP_j^{\beta_2}}{DIST_{ij}^{\beta_3}} \qquad [1]$$

Where:

- T_{ij} is the bilateral trade between country *i* and country *j*;
- GDP_i *(*GDP_j*)* is the economic size of country i (country j) measured by GDP;
- $DIST_{ij}$ is the bilateral distance between the two countries;
- β_0 is a constant while the β_1, β_2, and β_3 are the parameters frequently estimated in a log-linear model [5].

For this study, we use the modified gravity model (23):

$$lnX_{ij} = \beta_0 + \beta_1 lnGDP_i + \beta_2 lnGDP_j + \beta_3 lnDIST_{ij} + \beta_4 \delta_{ij} + \varepsilon_{ij} \qquad [2]$$

Where:

- X_{ij} represents the trade flow (exports and imports) between country i and country j;
- GDP_i and GDP_j denote the GDP of country i and country j, respectively;
- $DIST_{ij}$ is the distance between the capitals of the trading partners;
- δ_{ij} controls for other factors affecting trade flows, and
- ε_{ij} is the error term.

This equation was adapted to fit the gravity trade model for Kosovo's trade balance with CEFTA countries. The basic gravity model equation for Kosovo's merchandise trade is further refined as follows:

$$lnX_{ij} = \beta_0 + \beta_1 lnGDP_i + \beta_2 lnGDP_j + \beta_3 lnPOP_i + \beta_4 lnPOP_j + \beta_5 lnDIST_{ij} + \varepsilon_{ij} \ldots. \qquad [3]$$

Where:

- X_{ij} Represents the value of trade from Kosovo (country i) to the importer (country j).
- GDP_i and GDP_j represent the real GDP of Kosovo and the importing country.
- POP_i and POP_j denote the populations of Kosovo and the importing country, respectively.
- $DIST_{ij}$ represents the distance between Kosovo and the importing country, and
- ε_{ij} is the error term.

To assess the impact of various determinants on trade, is going to be followed a systematic measurement procedure:

First, the basic gravity model is going to be estimated to determine the coefficients of Kosovo's trade flows with CEFTA member countries (Model 1). Then, the model is enhanced with control variables to measure:

- The income effect (Model 2)
- The effects of linguistic similarities and colonial ties (Model 3)
- The effects of bilateral exchange rates and price stability (Model 4)
- The effects of corruption (Model 5)
- The effects of infrastructure development (Model 6)
- Finally, we estimate the joint effects of all included variables (Model 7).

The comprehensive model is expressed as follows:

$$lnX_{ij} = \beta_0 + \beta_1 lnGDP_i + \beta_2 lnGDP_j + \beta_3 lnPOP_i + \beta_4 lnPOP_j + \beta_5 lnDIST_{ij} + \beta_6 GDPp.cap\_diff_{ij} + \beta_7 LANG_{ij} + \beta_8 COL_{ij} + \beta_9 INF_i + \beta_{10} INF_j + \beta_{11} lnEXR_{ij} + \beta_{12} COR_i + \beta_{13} COR_j + \beta_{14} OPE_i + + \beta_{14} OPE_j + \varepsilon_{ij} \quad [4]$$

Where:

- $GDPp.cap\_diff_{ij}$ is the income effect variable that shows the income difference between Kosovo and the importer.
- $LANG_{ij}$ Indicates whether the trading partners share a common language.
- COL_{ij} Indicates whether the importer has been a colonizer in the past.
- EXR_{ij} is the real exchange rate between the trading partners' currencies.
- INF_i and INF_jrepresent the annual inflation rates in the exporting and importing countries, respectively.
- COR_i and COR_j represent the perception of corruption in the exporting and importing countries.
- OPE_i and OPE_j represent the levels of market liberalization in the exporting and importing countries, respectively.

This comprehensive model helps us understand the multifaceted determinants of Kosovo's trade with CEFTA countries and provides a robust framework for analysing export potential.

Table 1, provides descriptive statistics of the variables used for the estimation of the models together with their code, deception and expected signs. As the dependent variable is going to be considered Exports, trade value measured in millions of euros. On the other hand, as independent variables are going to be considered, the population, the log of GDP for Kosovo and its trading partners, as well as the log distance between capitals, as key explanatory factors. These are consistent with the standard gravity model theory, which holds that distance should have a negative impact on trade while GDPs and populations should generally have a positive effect. In order to capture structural and policy-relevant determinants, additional control variables are introduced across the seven models, including common borders, language, colonial ties, exchange rates, inflation, corruption, and institutional quality. The summary statistics presented in Table 1, show variation over time and across nations.

Table 1: Definition of Variables, Expected Sign of the Coefficient, and Summary Statistics of the Gravity Model

Variable	Code	Description	Expected Sign	Summary Statistics				
				Obs	Mean	STD.	Min	Max
Exports	Export	Trade value (in million EUR)		209	4.90	9.29	0.00	44.01
GDP (importer)	ln_GDP_imp	Importer's real GDP log (in million EUR)	+	209	10.44	1.26	7.72	13.21
GDP (exporter)	ln_GDP_exp	Exporter's real GDP log (in million EUR)	+	209	8.65	0.21	8.23	8.91
Population (importer)	ln_POP_imp	Log of population size (importer)	+/–	209	1.29	1.11	-0.91	3.64
Population (importer)	ln_POP_exp	Log of population size (exporter)	+/–	209	0.57	0.02	0.53	0.60
Distance	ln_DIST	Log of the distance between the capitals of the importer and the exporter	–	209	6.42	0.78	4.46	7.54

GDP p.cap differential	GDP p.cap._diff	Log of the absolute difference of GDP per capita	+/–	209	1.17	0.61	0.10	2.45
Common borders	CB	=1 cross common borders	+	209	0.21	0.41	0.00	1.00
Language	LANG	= 1 if trading partners share a common language	+	209	0.11	0.31	0.00	1.00
The colonial connection	COL	= 1 if the importer has been a colonizer in the past	+	209	0.26	0.44	0.00	1.00
Exchange rate	ln_EXR	Calc. of exchange rate between exporter/importer	+/–	209	0.05	0.22	0.00	1.00
Inflation (importer)	INF_imp	Importer's annual inflation rate	–	209	1.71	1.88	0.00	5.74
Inflation (exporter)	INF_exp	Exporter's annual inflation rate	–	209	3.42	3.30	-2.10	16.12
Institutional distance	INST_dist	The difference in institutional quality between the exporter and the importer	–	209	2.32	3.47	-2.40	9.40
Corruption (importer)	COR_imp	The degree of corruption of the importing country	–	209	1.74	1.52	0.00	5.62
Corruption (exporter)	COR_exp	The degree of corruption of the exporting country	–	209	-0.58	0.09	-0.76	-0.42
Liberaliz. of trade (importer)	OPE_imp	= GDP/Trade	+	209	0.16	0.53	-0.88	1.27
Trade liberalization (exporter)	OPE_exp	World Economic Forum (WEF) Infrastructure Index	+	209	123.37	48.54	61.15	324.50

Results and Discussion

In the following part of this paper, the results of the study related to the verification of the hypotheses of the study will be reflected. For this purpose, the comparative analysis of Kosovo's export flow in the countries in transition will first be implemented. Then, the results of the measurements of the gravity model of Kosovo's export to countries in transition will be reflected and analysed. While at the end of this part, the results of the measurement of the export potential of Kosovo in transition countries will be examined and the results are presented in Table 2.

Table 2: Gravity Model Results for Kosovo's Export to Countries in Transition

Export	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**
ln_GDP_imp	-.86*** (.149)	2.58*** (.678)	.376 (.257)	-.52*** (.146)	-.304 (.228)	-.165 (.221)	-.56*** (.164)	2.189 (1.467)

ln_GDP_exp	1.53	-1.295	-.4	1.094	.153	.872	3.307**	-1.343
	(1.564)	(1.33)	(.888)	(1.675)	(1.629)	(1.384)	(1.465)	(2.107)
ln_POP_imp	.754***	-2.7***	-.277	.223	.144	-.035	.296	-2.184
	(.174)	(.668)	(.245)	(.188)	(.239)	(.261)	(.198)	(1.482)
ln_POP_exp	7.677	2.811	17.58**	9.132	18.738	12.203	-3.881	9.283
	(15.25)	(11.44)	(7.394)	(16.13)	(15.25)	(13.12)	(13.29)	(13.29)
ln_DIST	-.95***	-.44***	-1.1***	-.72***	-.82***	-1.0***	-.91***	-1.2***
	(.076)	(.105)	(.167)	(.106)	(.086)	(.089)	(.085)	(.273)
GDPp.cap_diff		-4.4***						-2.55*
		(.793)						(1.412)
CB			1.33***					1.07***
			(.367)					(.332)
LANG			1.07***					1.00*
			(.224)					(.54)
LAND			-1.4***					-1.5***
			(.204)					(.397)
COL			2.21***					2.67***
			(.467)					(.51)
ln_ER				.293***				-.001
				(.051)				(.111)
INF_imp				.007				-.046
				(.036)				(.03)
INF_exp				-.004				.041
				(.03)				(.026)
INST_dist					-.46***			.146
					(.165)			(.212)
COR_exp						.767		.351
						(1.012)		(.708)
COR_imp						-1.3***		.703
						(.385)		(.544)
OPE_imp							-.02***	-.007**
							(.003)	(.003)
OPE_exp							-.042*	-.036**
							(.024)	(.015)
_cons	-2.727	-5.409	-2.748	-4.611	-2.313	-4.968	-8.886*	-.0750
	(5.731)	(4.656)	(4.056)	(5.872)	(5.629)	(5.62)	(5.207)	(5.947)
Observations	209	209	209	209	209	209	209	209
R-squared	.529	.712	.887	.678	.553	.626	.65	.888

Note: * p<.05; ** p<.01; *** p<.001; ( ) Std. Err

Through the comparative analysis, we can observe the export potential of Kosovo with countries in transition. From the above findings, it is suggested that Kosovo is not using its export potential in some Balkan countries, so the opportunity to export is much higher than it is currently. It is suggested that there is a positive trend in exports mainly with the Slavic countries, which connects them with a common linguistic or colonial past, and with some of them, the proximity of the borders. So, among the countries that export more is Albania, due to various factors such as the common past, speaking the same language, the proximity of the borders, with a value of 12.7? On the other hand, the results of this study identify the untapped exporting potential of Kosovo in the group of other countries in transition. This is especially true for the markets of Romania, Macedonia, Estonia, etc. On the other hand, the main obstacles in exploiting the export potential in these countries are related to higher transport and transaction costs, institutional similarities and higher quality standards.

The results of measuring the gravity model of Kosovo's export to countries in transition, to a large extent, are in compliance with the theoretical principles of the model. Based on the results of the basic model (Model 1), the economic power of the importer (GDP_{imp}) is a statistically significant variable, but the negative sign of this variable indicates that it has a negative impact on the export flow of Kosovo's goods. On the other hand, they reflect that the economic power of Kosovo (GDP_{exp}) is not a significant variable of the basic model of bilateral exchanges. In all models (except Model 7) the economic size of the exporter (Kosovo) is a statistically insignificant variable. The lack of significance for Kosovo's own GDP in most models reflects findings also by other studies that better explain export capacity in small, post-conflict economies (7, 24).

The results of the basic model suggest that the size of the market (POP_{imp}) is a statistically significant variable that has a positive impact on the export flow of Kosovo to partner countries in transition, despite the fact that the intensity of the influence of this variable (the size of the coefficient) is relatively small. Whereas, the model results emphasize that the exporter's market size (POP_{exp}) is an insignificant variable in all the measured models. Finally, it is worth noting that the distance between trading partner countries (DIST) represents the variable with the highest impact on the flow of Kosovo's exports to the markets of countries in transition, it is negative and significant in all the models. For example, in Model 1, the variable ln_Dist, takes the value of -0.95, which means a 1 % increase in distance between the capital of Kosovo and the capital of the trading partner, reduces export by 0.95%, ceteris paribus. Indeed, the results are in full coherence with the theoretical framework of the gravity trade model, which means that the increase in the distance between Prishtina and the capitals of countries in transition proportionally affects the decrease in the flow of Kosovo's exports to these countries. These results suggest the role of transport costs in the growth of trade exchanges, respectively Kosovo's export but also is evident in other studies (11, 15). Similar direction and significance of the variables was also suggested in the case of Vietnam and in Malawi (10, 17).

Based on the results of Model 2, the income level difference variable ($GDP_{p.c\_diff}$) is a statistically significant variable, but with a negative impact. The value of the coefficient -4.4, suggest that a 1% higher income inequality between Kosovo and its trade partner, reduced trade by 4.4%, ceteris paribus. Also, it is a statistically significant variable in the common-pooled model. If we refer to these results (of model 8) then it can be concluded that based on the results, Linder's hypothesis is verified against that of Heckscher-Ohlin (HO). Consequently, the results of this study suggest that differences in the level of income tend to shrink trade, emphasizing the convergence of income as an important factor in promoting Kosovo's export with transition countries. "When the level of Kosovo's export potential will also increase, so Kosovo mainly focuses its exports on countries where the income level is approximately similar. The negative effect of the GDP per capita differences aligns with the results also from other studies (2, 13).

Based on the results of Model 3, for the effects of neighbourhood (sharing a common border), linguistic similarities and colonial ties confirm the joint validity with the theoretical foundations of the gravity model. The positive and significant coefficients for these variables describe that Kosovar export is strongly influenced by transport, information and transaction costs. So, the intensity in Model 3, for the variable of common division of borders is significant (1.33***), which means that a country that is neighbouring to Kosovo, experiences 270% higher trade flows, ceteris paribus. This result is approximately the same in Model 8, (1.065***). In fact, the results predict a higher export to the countries that share the common border with Kosovo, and in our case Kosovo's export is oriented towards Albania, Macedonia and Montenegro, which is also technically acceptable because of the lowest cost of transport. Similarly, the common language aspect, as a statistically significant variable with a positive influence. This coefficient that has the value of 1.069 means that if a country speaks the Albanian language than it has 192% more exports from Kosovo. The same results were suggested also from other studies (17, 25).

In addition, also the colonial ties, is statistically significant variable with a positive influence. The value of 2.208, means that the countries that share the same historical socio-political background with Kosovo, import over 800% more from Kosovo

than those without such ties. So, the past with the neighbouring countries in a common socio-political community means that the export potential is more oriented towards these countries. On the other hand, the effect of the landlocked importing country is a statistically significant variable but with a negative impact (-1.393***), which suggests that Kosovo's export tends to increase in those countries that do not have access in the sea.

In the Model 4, the Exchange Rate variable (InEXR) is statistically significant and with a positive impact (0.293***) but not significant even in the Model 8 (-0.01). This means that Kosovo's exports go to those countries that have a stable exchange rate, as an example we have Albania, which for years had a stable exchange rate, so there are no exchange rate fluctuations. In the Model 5, the Institutional Distance variable ($INST_{dist}$) is statistically significant (-.459***) with a negative impact but not significant even in the 8th model. This suggests that Kosovo exports to those countries where the level of quality of institutions is approximately the same. If there is institutional distance, the institutional quality differs and the export is lower. In the Model 6, the import Corruption variable (COR_{imp}) is statistically significant but with a negative impact (-1.304***). This result suggests a 1 unit more in the level of corruption in a country, will reduce the ability to export to that country by 73%. So corruption is a limiting factor. Also in other studies, the corruption perception of the importer is suggested to have a significant and negative relationship with trade flows (26, 27)

In the Model 6, the opening variable of market liberalization (OPE_imp) is a statistically significant variable (-0.23***) and in Model 7 (OPE_-0.42*) but with a negative impact, suggesting that Kosovo tends to export less to more liberalized countries. The results are consistent with the studies conducted for transition economies that find it hard to compete with liberalized markets which are due to low productivity and lack of product diversification (8). Another study suggests that small economies such as Kosovo or Albania often benefit from referential or protected access (13). The obtained data related to the level of openness of market liberalization are not consistent with the theoretical foundations of the gravity model.

Conclusion

This study examines Kosovo's export potential to transition countries from 2005 to 2015 using the gravity model and the Poisson Pseudo-Maximum Likelihood Estimation (PPML) method. The findings suggest that export flows are positively influenced by the GDP of importing countries, reflecting their greater capacity to absorb exports compared to Kosovo's own export capabilities. However, increases in Kosovo's population size appear to dampen export flows due to rising domestic demand. The study also finds that Kosovo's exports are primarily concentrated in neighbouring countries such as Albania, North Macedonia, and Montenegro, indicating that geographic proximity and lower transportation and transaction costs significantly influence trade patterns. Additionally, exports are facilitated by cultural and linguistic similarities and shared historical backgrounds with these countries. Furthermore, exports tend to occur between countries with similar corruption levels, underscoring the role of both economic and non-economic factors in shaping Kosovo's export trends. These findings provide valuable insights for policymakers focused on enhancing Kosovo's international trade relationships.

As suggested from the results of the study, the Kosovo's export portfolio is very narrow and dominated by a low number of low-level and resource-based sectors. In general, Kosovo exports in categories that relate to metals (e.g. iron, steel, lead, zinc), mineral products, textile, beverages such as soft drinks and wine and also some plastic and rubber in small amounts. These exports are conducted more in the neighbouring country, as suggested by the study, such as in Albania, North Macedonia and Montenegro but also in Germany as most of the Kosovo diaspora live there.

It is recommended that Kosovo's strategy for trade expansion should in focused in two approaches. First fully, in the short-run, Kosovo should strengthen the trade links with geographically closed countries, such as with Albania, Montenegro and North Macedonia as with these countries Kosovo shares common language, historical ties as well as institutional similarities. In the long-run, Kosovo should strategically develop trade links with farther, underutilized partners such as Germany, Romania, Estonia, and Bulgaria. These countries have shown untapped export potential in

the analysis, but current trade volumes remain low due to institutional differences and higher trade costs. Policy efforts such as bilateral agreements, trade promotion missions, and harmonization of standards can help overcome these barriers.

In terms of industries**,** Kosovo should prioritize sectors where it can in some level develop comparative advantages, especially:

- Processed food and beverages (leveraging agricultural base),
- Textiles and apparel, which align with low-cost labour competitiveness,
- Metals and mining (notably in raw and semi-processed goods),
- IT and business process outsourcing (BPO)**,** given Kosovo's young, multilingual population and growing digital infrastructure.

On the other hand, this study underscores the necessity for Kosovo to develop an adaptive trade policy that extends beyond neighbouring countries, advocating for a strategic shift to diversify export markets and leverage comparative advantages more broadly. As a small economy with a liberal trade system, Kosovo is particularly vulnerable to restrictive trade measures that could adversely impact its economy. While there is significant emphasis on maximizing exports within its immediate region, the research highlights potential for further enhancing export activities. The study identifies several challenges encountered during the research process, primarily related to the limited availability of recent data, which mainly covers the period from 2005 to 2010. This limitation highlights a gap in the continuity and modern relevance of trade data, crucial for informing current policy decisions. Additionally, the lack of specific sectoral data may have affected the breadth and depth of the findings. The research was further complicated by a scarcity of local scholarly works and theoretical literature on the gravity trade model in the Albanian language, posing challenges in applying existing economic theories to Kosovo's context. These challenges underscore the need for enhanced support for economic research in Kosovo, including the development of academic resources in local languages and expanded data collection across more sectors and recent periods. This will aid in crafting informed, effective trade policies and in fostering deeper economic engagements.

This study emphasizes the need for Kosovo to broaden its trade policy to include market diversification and the enhancement of export capacities to promote economic growth and resilience. It suggests that Kosovo should expand its trade beyond neighbouring countries to access the economic benefits of more distant markets. The findings indicate that these markets are underutilized despite the advantages they may offer. Therefore, Kosovo is encouraged to develop deeper trade relations with non-neighbouring countries through targeted trade missions, new trade agreements, and the promotion of its unique products and services.

Furthermore, the study reveals the importance of targeting larger markets that have a greater capacity to absorb exports from Kosovo, guiding promotional efforts and support mechanisms towards businesses that are scaling up for international trade. This requires a dual strategy of strengthening regional trade ties and building domestic capacities to meet the demands of broader markets. Enhancing institutional support to streamline customs and reduce bureaucratic hurdles is also essential for simplifying the export process and making Kosovo's export sector more dynamic. Additionally, the provision of comprehensive market intelligence to Kosovar businesses is crucial. This includes information on consumer preferences, regulatory standards, and entry strategies in foreign markets, which will help enhance their global competitiveness.

Abbreviations

EU: European Union, FDI: Foreign Direct Investments, GDP: Gross Domestic Product, PPML: Poisson Pseudo Maximum Likelihood, SME: Small and Medium Enterprises.

Acknowledgement

This study is not funded by any agency and is conducted by the authors independently.

Author Contributions

Vesel Usaj: Conceptualization, Methodology, Software, Investigation, Resources, Writing, Anera Musliu: Conceptualization, Methodology, Software, Investigation, Resources, Writing, Leonora Sopaj Hoxha: Data curation, Festim Tafolli: Draft preparation, Review Writing.

Conflict of Interest

There is no conflict of interest with the content of this article.

Ethics Approval

Not applicable.

Funding

The current research has not received any specific grant from funding agencies that belong to public, not-for-profit, or commercial sectors.

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