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The determinants of intra-regional trade in the Western Balkans*[1]

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Abstract

The purpose of this paper is to identify factors that have an influence on bilateral trade among the Western Balkan countries for the period from 1995 to 2012. Unlike a majority of works that have dealt with the subject of trade in the Balkans or the SEEs, not only geographical, economic or political factors are taken into account, but also factors constituting cultural, communicational and historical types of the so-called "distance" between countries. In order to assess their influence on trade values, an augmented version of the gravity model is employed. It was estimated threefold: as pooled data by OLS, as a random effects model and as a fixed effects model with an additional estimation of time-invariant variables following the method of Cheng and Wall (2005). The results of the research are surprising, as the strongest influence on trade values were exhibited by variables representing ease of a direct communication and similarity of religious structures. In addition, war and one-year-post-war effect showed a strong and statistically important influence. Thus, the main conclusion is that non-economic factors in the region of the Western Balkans play the most important role in determining trade values between countries.

Key words: *trade determinants, Western Balkans, gravity model, panel data, distance*

JEL classification: *F14, F15, C23*

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1. Introduction

The problem of finding factors that determine trade between countries has been constantly present in economic literature since Adam Smith's theory of the absolute advantage. However, just very recently authors tended to investigate trade determinants with a wider scope of potential answers, than just geographical, economic or political factors, which constituted typical explanations so far. Specifically those "other" issues may play a prominent role in the analyzed region of the Western Balkans (further referred to as WB).

Firstly, the region is situated in the joint of three big religions: Catholicism, Orthodoxy and Islam. This brings upon a question, if faith matters in trade relations or, as it was put by Helble (2007), "Is God good for trade?" (for related analysis see Guiso et al., 2004, Lewer and van der Berg 2007, Melitz and Toubal 2012). Secondly, spoken languages in the WB region show a high level of similarity (except Albanian)[4]. According to recent studies on language similarity and trade, the relation should be very strong, especially when we look at languages as means of communication (different measures of the language similarity are presented in Boisso and Ferrantino 1997, Fearon 2003, Guiso et al. 2004, Laitin 2000, Melitzt 2008, Melitzt and Toubal 2012). Thirdly, in the 1990s the Balkan countries suffered wars and conflicts which could have a distorting influence on the natural trade pattern among the economies. This issue seems to be rather neglected in the empirical research concerning trade (for exceptions see Guiso et al. 2004, Martin et al. 2005, Melitz and Toubal 2012, Sarkees and Wayman, 2010). The relatively small region of the Western Balkans, which is inhabited by ca. 22 million people, is so diversified internally, that it condenses many problems that may distort natural trade patterns not only there, but worldwide.

As for the object of the research, the Western Balkans is a political, geopolitical and economic term used in terminology of the European Union since the early 1990s to describe countries of the former Yugoslavia[5] minus Slovenia plus Albania[6]. Our research thus deals with the analysis of bilateral trade among five/six countries: Albania, Bosnia and Herzegovina, Croatia, Macedonia and Serbia and Montenegro (as one country until 2007 or as two entities afterwards). Although the Western Balkans does not represent a significant trading partner for the European Union, the largest trading partner of all countries of the Western Balkans is the EU, constituting

[4] Serbian, Croatian and Bosnian belong to South-Western Slavic and Macedonian to South-Eastern Slavic languages (www.ethnologue.com, accessed: 30.09.2013).

[5] In this paper Kosovo under Resolution 1244/99 is not included in the analysis due to lack of comparable data sets.

[6] With respect to the time horizon of our research, Croatia is classified as a country of the Western Balkans, although in the EU terminology, after becoming its full member, it is no longer considered as the Western Balkan country.

nearly two-thirds of the total trade of the region (European Commission, 2014). EU granted a free trade regime to all countries of WB, while the reciprocal elimination of barriers by WB countries on imports from the EU has been gradual and in the framework of the Stabilization and Association Processes. The European Union concluded Stabilization and Association Agreements with Macedonia and Croatia in 2001, Albania in 2005 and Bosnia and Herzegovina, Montenegro and Serbia in 2008. This relatively late involvement in the EU-integration of the Western Balkan countries might have caused stronger intra-regional trade relationships. As Association Agreements required that the exports to the EU would contain minimum levels of input originating from the EU-members or from the countries that signed the Agreements, the WB countries could have been left behind not only as a potential exporter of final goods to the EU, but also as a supplier of inputs for companies from the Central and Eastern Europe, which had signed the Association Agreements much earlier (see Stojčić (2012) and Tkalec and Vizek (2014) for the case of Croatia).

In December 2006, WB countries signed CEFTA-2006 (Central European Free Trade Agreement)[7], which replaced a network of 32 bilateral free trade agreements between them. All tariff barriers were thus removed while removal of non-tariff barriers is carried out in the framework of CEFTA-2006[8]. By acquiring a full membership in the EU in July 2013, Croatia has emerged from new CEFTA. Trade characteristics of the WB countries show that they can be regarded as small open economies with high share of trade in gross domestic product. Over last three years of our analysis, between 2010 and 2012, Albania had an average trade to GDP ratio of 85.9, Bosnia and Herzegovina 97.8, Croatia 82.2, Macedonia 121.9, Montenegro 103.7 and Serbia 92.5[9].

All countries of the Western Balkans are regarded as countries in the process of transition (EBRD, 2013) but there are significant differences in the economic welfare among them. In 2000, Albania was the poorest country of the region with GDP per capita measured by purchasing power parity (PPP) of 3,846 international US dollars while in the same year Croatia had 11,148 US dollars of GDP p.c. In 2012, the poorest country by GDP p.c. was Bosnia and Herzegovina with 8,047 international US dollars, whereas Croatia as the leader of the region had the highest GDP p.c. of 18,101[10] US dollars.

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[7] Croatia and Macedonia entered the CEFTA yet before its transformation to CEFTA-2006 (in 2003 and earlier in 2006 respectively).

[8] For the effects of CEFTA-2006 see (Molendowski, 2010, Molendowski, 2011).

[9] Data were derived from *Statistics Database* of World Trade Organization in April 2014, Available from:<http://stat.wto.org/CountryProfile/WSDBCountryPFReporter.aspx?Language=E>.

[10] Data were derived from *World Economic Outlook* of International Monetary Fund in April 2014, Available from:<http://www.imf.org/external/pubs/ft/weo/2014/01/weodata/index.aspx>.

Taking into account all the so far presented internal diversity of the Western Balkan region, the main hypothesis that was tested in our research stated that there were more than just geographical, economic and political factors that influenced trade among WB countries over the time period from 1995–2012. Auxiliary hypotheses were appointed to certain types of "distances" (communicational, cultural, political and historical) and their specific impact on trade values[11].

The rest of the paper is structured as follows. In the second part the existing literature on trade in Western Balkans and South East Europe is reviewed, especially positions that explore the problems with use of the gravity model. In the third part, the methodology of the current research is presented. It is followed by the fourth part which encompasses data sources and analysis. Results and discussion are presented in the fifth part, whereas conclusions are drawn in the sixth and the closing one.

2. Literature review

In general, analysis of trade in the South East Europe or in the Western Balkans was in focus of many researchers and scholars especially in the context of regional cooperation and free trade arrangements (World Bank, 2008, EBRD 2003, Mehić and Babić-Hodović, 2011, Nikolić et al., 2011, Botrić, 2012). On the other hand, a majority of authors devote their attention to the research of bilateral trade of one (their) country with the rest of the world (Jovičić et al., 2001, Miljovski and Uzunov, 2002, Bilas, 2007, Mojsoska-Blazevski and Petreski, 2010, Družić et al., 2011, Ćejvanović and Džafić, 2011, Bjelić and Dragutinović Mitrović, 2012, Fetahu, 2014) most likely because integration processes in South East Europe, in contrast to Central Europe, lasted several years, leaving researchers with the problem of how to define a region or group of countries they want to explore. There is a lack of literature which would analyse trade among a group of countries constituting the WB region, especially one that would be based on the gravity model of trade (Begović (2011) analysed the CEFTA-2006 countries). Although in the last ten years, this topic is becoming more important and more interesting for a number of scholars, not only from this region.

As for the purpose of studies, a significant number of authors were trying to assess the potential trade of a country or the region (see Miljovski and Uzunov, 2002, Christie, 2002, Kaminski and de la Rocha, 2003, EBRD, 2003, Bussière et al. 2005; Kernohan, 2006, Damijen et al., 2006, Kucharčuková et al., 2010, Pllaha, 2012). However, many of them aimed at finding out specific determinants of trade, most often focusing on political issues of trade liberalization or regional integration

[11] This paper presents results of a research, earlier stages of which were outlined in Klimczak (2014a), Klimczak (2014b) and Klimczak and Trivić, (2014).

(Adam et al., 2003, Herderschee and Qiao, 2007, Bjelic et al., 2013, Toševska-Trpčevska and Tevdovski, 2014). Other possible trade determinants, like common history, religion or language were usually neglected.

Some of the first attempts to explain regional trade were made by Christie (2002). By using the classical gravity model, the author came to the conclusion that in the context of intraregional trade, South East Europe – 7 and South East Europe – 11 cannot be considered as a region, while division in three sub-regions better fits the classical model. This was probably due to the time period of analysis as there were still strong negative effects of the recent war, especially in trade between FR Yugoslavia (Serbia and Montenegro) and Croatia and between Bosnia and Herzegovina's trade with both – Croatia and FR Yugoslavia. Kaminski and de la Rocha (2003: 41) focusing on the future of regional trade liberalization among SEE-5 (Albania, Bosnia and Herzegovina, Croatia, Serbia and Macedonia) showed similar results. Using a very simple gravity model due to the poor quality of data, they found out that part of the intraregional trade was below potential (trade between FR Yugoslavia and Croatia) and part of it was above (between Bosnia and Herzegovina and both FR Yugoslavia and Croatia) which suggested a division of the region into sorts of dyads and enabled them to better predict intraregional trade by means of the gravity model. An important conclusion drawn from both researches (Chrisite, 2002, and Kaminski and de la Rocha, 2003) is that recent history of the region, i.e. dissolution of ex-Yugoslavia as well as very specific and similar cultural ties among these countries, played an important role in determining potential trade among the region.

The EBRD (2003) study employed a more complex gravity model to compare the actual level of trade with the predicted level between seven SEE countries in transition. The baseline gravity model which included only country's GDP in PPP, the distance between capitals and a measure of bilateral exchange rate volatility – showed that the actual trade is around 25% of the predicted trade in the SEE. When some other determinants of trade were included – the size of a country, the number of borders a country has to cross to get to a target market, the quality of transport infrastructure, the extent of trade liberalization and the quality of institutions – the actual trade was around 42% of its potential indicating still that there are some other region-specific factors that should be included in order to better explain intraregional trade.

Instead of using cross section data as Christie (2002) and Kaminski and de la Rocha (2003), Damijen et al. (2006) employed the panel-data approach in the gravity model to explore trade potential in SEE intraregional trade and with the EU for the period between 1994 and 2002. Using the model augmented with several additional variables – exchange rate volatility and a set of dummy variables for six different country groups, authors, in respect to Western Balkans or SEE-5, found out that the actual trade between the WB countries is close to its potential, thus indicating that

future liberalization would not have a significant impact on trade flows. However, the actual trade between ex-Yugoslav countries was far above potential trade which was predicted by the gravity model, indicating again that some other factors should be included in order to explain trade among ex-Yugoslav countries.

Inspired by a World Bank study from 2005, which confirmed below-potential trade among Western Balkan countries and importance of regional trade integration and co-operation, Kernohan (2006) analyzed trade potential among SEE-9 (Albania, Croatia, BiH, Macedonia, Serbia, Montenegro, Romania, Bulgraia and Turkey) with the gravity approach. His results suggests that the SEE region could be regarded as two blocks – one block encompasses ex-Yugoslav countries whose trade is far above its trade potential while another block of non-ex-Yugoslav countries is not integrated enough with the rest of the region, especially Turkey. This is in line with Pjerotić (2008: 511) who concluded that the significance of intra-SEE trade varies considerably across countries.

Using the enhanced gravity model, Bussière et al. (2005) tried to assess the future integration of the Central and South Eastern European economies with the EURO area based on bilateral trade flows from 1980 to 2003. Besides standard determinants such as economic size and geographical distance, several additional variables were used: common language, common border, being a part of the same territory, participation in a free trade agreement and valuation effects of exchange rates. According to Bussière et al. (2005: 29-30) countries of the Western Balkans – Albania, Bosnia and Herzegovina and Macedonia, and to a lesser degree Croatia, still have significant space to raise their trade intensity with the euro area. Moreover, these countries show a low degree of trade integration with the world economy. Similarly to Busier et al. (2005), Herderschee and Qiao (2007) proved by a simple gravity model that CEFTA-2006 would in future enhance integration of the region with the EU and inside the region itself, suggesting a rise of intraregional trade in CEFTA-2006 by 38-49 per cent.

According to Kucharčuková et al. (2010) who used the augmented gravity model with several additional variables, the below-potential international trade of SEE countries given their income levels and geographical location could be explained by the low quality of economic institutions and below-potential regional cooperation. Furthermore, authors suggest that the regional conflicts in the past could be an initial cause of bad institutions which is in line with Adam et al. (2003: 3) who blame the horrific conflicts for the small scope of the regional co-operation. Based on a gravity model with several variables – economic size, geographical distance, similarities in demand, regional cooperation, common border and common language in the case of BAFTA and CEFTA from 1996 to 2000, authors predicted a necessity of multilateral free trade agreement among SEE countries (Adam et al., 2003: 14). Nine years later, for nine SEE countries – Albania, Bosnia & Herzegovina, Bulgaria, Croatia, Macedonia, Romania, Serbia & Montenegro, Slovenia and Turkey, Pllaha

(2012) confirmed again that most SEE-9 countries trade below their potentials. The gravity model based on the panel data approach was augmented with a dummy variable called a colonial link indicating belonging to the same territory in the case of ex-Yugoslav countries while the overall scope of the analysis was to determine the importance of bilateral trade agreement on trade flows. In the case of the colonial link, which approximated *common history* and *cultural similarities,* the model showed a positive influence of this variable on bilateral trade. The same effect was found for the free-trade-agreement dummy variable which was also statistically significant, thus indicating that the removal of trade barriers contributed to trade intensification among SEE-9 countries during the period 2002-2010 (Pllaha, 2012: 21).

Toševska-Trpčevska and Tevdovski (2014) used an augmented gravity model primarily to asses the impact of customs and administrative procedures on trade among South East European countries in the period between 2008-2012 and found that sharing the same border, being a part of the ex-Yugoslavian market and sharing a common history were still important factors of trade, while customs and administrative procedures were important determinants of the volume of traded goods in the region but depended on how these variables were measured in the model. Similarly to the above authors, Bjelić et al. (2013) analyzed bilateral trade of the Western Balkans as a group and the rest of the world, focusing on trade with EU as the main trading partner of the WB countries. They found the border effect as a significant determinant of trade while signing of the Stabilization and Association Agreements was not. Regarding the variables they were focusing on – administrative and technical barriers, among the Western Balkans and between Western Balkans and EU, the results were mixed: technical barriers were an important impediment for the export of WB countries to the EU as well as administrative barriers, while the latter ones were not important factors of intraregional trade.

Related to our study, an analysis of the influence of cultural, historical, and political ties on patterns of trade in the SEE transitional countries based on a simple gravity model could be found in Gjipali et al. (2012). Authors showed that countries that share common border trade almost twice more than countries that were not, while countries with similar languages trade three times more, and countries that had been a member of ex-Yugoslavia trade even four times more. Similarly, an interesting but not well-grounded analysis of the impact of cultural ties between Balkans and Turkey was developed by Gumuscan and Kahveci (2012).

3. Methodology and method of analysis

The gravity model of trade has been present in economic literature since 1960's. The early concepts were presented by Tinbergen (1962), Pöyhönen (1963) and Linneman (1966), who employed in their analysis of trade assumptions similar to

the Newtonian gravity concept. It stated that the gravitational force depends on the "masses" of entities and "distance" between them. The first attempts to justify the gravity equation with a theoretical model were made by Anderson (1979), who based on the Armington assumption that the products are differentiated by the country of origin. The approach of Anderson was followed by Bergstrand (1985) who derived the gravity equation from CES preferences and the Armington-differentiated goods. The New Trade Theory-justifications came with the works of Helpman (1981) and Helpman and Krugman (1985) who abandoned the neoclassical assumptions in favour of the product differentiation among firms and monopolistic competition. Monopolistic competition also formed the ground for the New Economic Geography, which introduced endogenous location of firms and demand and led to a conclusion that factor's movement and profitability caused re-allocation of the production[12].

In trade analysis, the common proxies of "mass" are country GDP and/or population, whereas "distance" used to be interpreted mostly as physical distance between capital cities or main economic regions (see Kandogan, 2009, Wydymus, 2012). One of the most popular versions of the gravity equation is presented in Equation (1).

$$EXP_{ijt} = a_0 GDP_{it}^{a1} GDP_{jt}^{a2} POP_{it}^{a3} POP_{jt}^{a4} DIST_{ij}^{a5} e^{\delta_{ijt}} \quad (1)$$

where:

EXP_{ijt} – export from country i to country j in year t

GDP_{it} – country's i GDP in year t

GDP_{jt} – country's j GDP in year t

POP_{it} – country's i population in year t

POP_{jt} – country's j population in year t

$DIST_{ij}$ – great circle distance between capital cities of countries i and j

a_0 – constant

$a_1 - a_5$ – coefficients

δ_{ijt} – error term

Export, import or total trade can serve as dependent variables, although the latter one would not provide any information on whether determinants influence more export or more import between two countries. The model is usually expressed as a power function and further log-linearized, which allows the coefficients to be interpreted as elasticities.

[12] More detailed reviews of the theoretical foundations of the gravity models of trade are presented in: Cafiso 2007, Cieślik 2009 and Kandogan 2009.

Although the so-called standard gravity model was very directly referring to the Newtonian gravity concept, in the past forty years numerous variations of it were tested, in order to capture different trade determinants. This process showed clearly that "distance" in trade is something more than just a geographical one.

One of the earliest attempts to categorise and measure different forms of "distance" between countries showed up in non-English literature. Namely Zeliaś (1991) in his analysis of trade among ex-Soviet block countries used the following division of the "distance" types:

1. Physical (in kilometres)
2. Time (in the meaning of time needed to transport goods from one country to another)
3. Economic (eg. transport cost)
4. Social (eg. unemployment)
5. Political (binary variable indicating political preferences between countries, eg. "1" for the ex-Soviet block).

However, it should be noted, that the first three types of "distance" are *de facto* different measures of the same category – a physical distance. No matter if measured in miles or hours needed to overcome the distance or cost of this process, they still characterise a "physical" distance.

Over a decade after Zeliaś (1991), in their often cited works Anderson and van Wincoop (2001, 2004) started a broad discussion on the role of what they called the "cost" of trade. The starting point of their analysis is the so-called "border effect" described by McCallum (1995). Anderson and van Wincoop spread the research for a wider set of countries and presented their own division of "costs" or "distance":

1. Policy barriers
2. Transport costs
3. Wholesale and retail distribution costs.

Anderson and van Wincoop (2001, 2004) point out another type of "distance" related to a common language in both trading countries. Moreover, they characterise "distance" in total as price dispersion between trading countries, which should proxy all barriers to trade. On the other hand, they emphasise that the inclusion of a "multilateral trade resistance" variable in the model is needed in order to encompass relative barriers to trade.

Another milestone in the theory of a "distance" in trade are papers by Melitz (2008) and Melitz and Toubal (2012). Unlike most of the other studies, which stress the

physical, economic or political barriers to trade, these authors draw our attention to cultural and communicational obstacles. Although many other previous studies raised the language issue, it was usually simplified as binary variable taking value of "1" when countries had the same official language. In the above mentioned works, Melitz and Melitz and Toubal present more complex measures of communicational possibilities among people in trading countries[13].

In our analysis we divide the "cost" or "distance" between countries into six categories:

1. Physical, which refers to geographical position of one country in relation to another.
2. Political, which refers to effects of political decisions, e.g. WTO membership, membership in a FTA.
3. Economic, proxying diversity in development in trading countries.
4. Cultural, referring to cultural diversity of two countries.
5. Communicational, reflecting problems in effective, direct communication between citizens.
6. Historical, which shows how a common history determines trade relations.

The first three of the above types of "distance" are commonly used, whereas the latter three, especially cultural and communicational "distance", tend to gain more attention of the researchers mainly in more recent studies. By incorporating all six types in the gravity model we obtain Equation (2), where the first two vectors encompass variables which characterize "masses" of exporting and importing countries, whereas the following six vectors represent variables of six types of "distance": physical, political, economic, cultural, communicational and historical.

$$EXP_{ijt} = a_0 x_{it}^{\beta 1} m_{jt}^{\beta 2} df_{ijt}^{\beta 3} dp_{ijt}^{\beta 4} de_{ijt}^{\beta 5} dku_{ijt}^{\beta 6} dko_{ijt}^{\beta 7} dh_{ijt}^{\beta 8} e^{\delta_{ijt}} \quad (2)$$

where:

EXP_{ijt} – export from country i to country j in year t

$x_{it}^{\beta 1}$ – vector of variables representing "mass" of the exporting country (i)

$m_{jt}^{\beta 2}$ – vector of variables representing "mass" of the importing country (j)

$df_{ijt}^{\beta 3}$ – vector of variables representing physical "distance" between countries i and j

[13] A subsequent discussion on the typology of "distance" in trade has been taking place in the literature related to business studies (see for instance: Berry et al. (2010), Ellis (2007), Ghemawat (2001), Hofstede (1980), House et al. (2004), Williamson (1985).

$dp_{ijt}^{\beta 4}$ – vector of variables representing political "distance" between countries *i* and *j*

$de_{ijt}^{\beta 5}$ – vector of variables representing economical "distance" between countries *i* and *j*

$dku_{ijt}^{\beta 6}$ – vector of variables representing cultural "distance" between countries *i* and *j*

$dko_{ijt}^{\beta 7}$ – vector of variables representing communicational "distance" between *i* and *j*

$dh_{ijt}^{\beta 8}$ – vector of variables representing historical "distance" between countries *i* and *j*

a_0 – constant

$\beta 1 - \beta 8$ – vectors of parameters

δ_{ijt} – error term

In the case of two out of the eighteen explanatory variables used in the model we found it necessary to use new indexes that would be a proper approximation of phenomena they describe – similarity of religious structures of both of the analysed countries and ability of their societies to communicate directly. The first of them (variable RELIG), one of the two "cultural" determinants of trade in the Western Balkans, was an index constructed as a sum of differences of shares of three main religions represented in the region, which altogether accounted for at least 95% of population in each of the analysed countries. The reason for including this variable of structural religious similarity was the fact that there is religious diversity in those countries (see Table 1). Next to quite homogenous countries like catholic Croatia (91%) or orthodox Serbia and Montenegro (71%) and Macedonia (67%), there are states of more complex religious structures, like Albania or Bosnia.

Table 1: Shares of three main religions in the Western Balkan countries in 2005

– - – in percent (%)

Countries	Catholicism (1)	Orthodoxy (2)	Islam (3)	Non-religious (4)	Total 1+2+3+4
Albania	15	24	39	18	95
Bosnia & Herzegovina	12	27	55	5	100
Croatia	84	6	2	6	98
Serbia & Montenegro	5	59	19	14	97
Macedonia	1	62	29	7	98

Source: Own concept based on data from http://www.worldmapper.org/extraindex/religion_notes.html (20.09.2013)

Inclusion of differences in religious structures in the gravity models of trade could be seen in literature after the year 2000. In case of some of the papers this problem is addressed by including the sum of products of percentage of people in both countries who share the same religion (see Helble 2007, Guiso et al., 2004, Melitz and Toubal 2012). However, this measure brings low results for internally diversified countries, which is a significant shortcoming. On the other hand, Kandogan (2009) suggests the use of the Euclidean distance to measure religious distance between countries.

In this research, the applied measure (Equation 3) shows in what percentage the shares of certain religions in certain countries coincide[14]. It takes values between <0;1>, which is a desirable feature in a regression analysis where other variables (like LANG) share the same scope.

$$RELIG_{ij} = 1 - \Sigma_{k=1...n} \frac{|R_{ik} - R_{jk}|}{2} \quad (3)$$

where:

$RELIG_{ij}$ – index of similarity of religious structures of countries i and j

R_{ik} – share of people belonging to religion group k in country i

R_{jk} – share of people belonging to religion group k in country j

In this research, the use of n = 3 religions was quite obvious, as the sum of their shares together with a share of non-religious people accounted for at least 95% of countries' total populations. However, in other studies it remains as open question as to how to choose the number of religions investigated.

Unlike the issue of religion, the issue of languages that citizens of both trading countries speak was long used in the gravity models. In the majority of instances it was simplified to a binary variable taking the value of "1" when countries shared the same official language. How poor such measure would perform, shows an example of the Western Balkans, where its value for a country-pair Croatia and Serbia would be "0", though people in these countries can communicate easily in their mother tongues.

Similarly to the "religion" variable, more complex indicators showed up in literature after the year 2000. Firstly, authors began to include the heritage of the linguists researching actually spoken languages, not the official ones (see Guiso et al. 2004, Boisso and Ferrantino 1997, Melitz and Toubal 2012). Secondly, it was finally noticed that some languages are more similar to one another, than others. This can

[14] This structure similarity measure is a special case of the Bray-Curtis index, which is mainly used in natural sciences (Tajoli and De Benedictis 2006). It was theoretically derived by Sun and Ng (2000).

result in situations where people that speak different languages, but belonging to the same branch of the language tree could, to some extent, communicate. Thus, a variable representing similarity of the main languages in both trading countries was introduced by some authors. It was operationalised as the "distance" coming from the language tree (see Fearon, 2003, Laitin, 2000, Melitz and Toubal, 2012). The missing part was the connection of the actually spoken languages with their similarity. The solution came in the work of Klimczak (2014a), who constructed a matrix of percentage products of shares of people speaking each of the "n" languages in two chosen countries (see an example of the matrix for a country pair Albania-Bosnia in Appendix 1). In the second step, this matrix was multiplied by ratios reflecting the similarity of certain languages[15] (see Appendix 2 for details), giving back the spoken languages similarity index of two countries (Equation 4).

$$LANG_{ij} = \Sigma_{l=1...n}^{k=1...n} S_{ik} \cdot S_{jl} \cdot sim_{kl} \tag{4}$$

where:

$LANG_{ij}$ – index of spoken languages similarity of country i and j

S_{ik} – share of people speaking language k in country i

S_{jl} – share of people speaking language l in country j

sim_{kl} – similarity ratio of languages k, l

Values of RELIG and LANG indexes are presented in Appendix 3.

In order to control for unobserved country-specific factos, like eg. multilateral resistance or internal distance, dummy variables for the exporter country were added to the model.

As for the data and estimation techniques, in a majority of the studies before the 1990's, cross-sectional data was used and only more recent studies tend to estimate panel data (Baltagi et al. 2003). However, there is no one commonly accepted estimation technique. Thus in this paper the panel data model was estimated threefold:

- as pooled data model with OLS;
- as fixed effects model, with additional estimation of the time-invariant variables;
- as random effects model.

[15] As for four stages of similarity in the language tree, the values of the ratios were 0.25, 0.5, 0.75 and 1 (see Klimczak 2014a, Melitz and Toubal 2012).

In order to decide upon the most appropriate model specification, three tests were run. At first, a test was run on differing group intercepts, in order to check if groups have a common intercept. Then the Breusch-Pagan test was run to verify a hypothesis, that variance of the unit-specific error = 0. At the end, the Hausman test was carried out to see if the GLS estimates used in the random effects model are consistent.

Various studies show that the model with fixed effects is the most appropriate for the estimation of gravity equations (Cheng and Wall, 2005, Baltagi et al., 2003, Bussière et al., 2005). An important obstacle in this case is the inability of the fixed effects models to estimate time-invariant variables. Cheng and Wall (2005, further referred to as "ChW") propose as a solution to this problem a two-stage estimation. In the first stage a fixed effects model is estimated. Then, in the second step all time-invariant variables are being regressed on country-pair fixed effects which come from the first stage estimation. This method was used i.a. by Bussière et al. (2005) who investigated processes of trade integration of the Middle and East European countries[16].

4. Empirical data and analysis

Apart from the typical variables of the gravity model, GDP and population of both countries[17] and physical distance between them, in the presented analysis a number of additional variables were added. Based on the trade theory, results of other research projects or regional specifics of the Western Balkans, all of them could have been presumed to have a substantial influence on trade values. A majority of the variables were specified in a way that has been already present in the literature. However, taking into account the extent to which the Western Balkan region is diversified, less known measures were also applied to proxy cultural, communicational and historical "distance" (see Klimczak 2014a).

Table 2. includes a description of certain variables representing "distance" which are tested in the model presented further. They are classified into groups according to the division of types of "distance".

Two measures were implemented in order to capture the importance of the physical (or geographical) "distance", both of them in the form most commonly used in

[16] Alternativelly to the ChW approach, the Hausmann-Taylor approach is used to deal with time-invariant variables in the fixed effects models (see Bjelić and Dragutinović Mitrović, 2012 as a recent example).

[17] Data for GDP and population came from UNCTAD STAT.org (accessed 18.11.2013). GDP was taken in constant prices (2005) and exchange rates. Data on physical "distance" between capital cities comes from www.cepii.org (accessed 18.11.2013).

the literature. DIST was supposed to provide information on great circle distance between capital cities of the analysed countries. On the other hand, BORDER was a binary variable taking the value of "1" in instances when countries share a common land border. As the region is geographically limited, both variables were expected not to have any greater influence on trade values.

Table 2: Variables representing "distance" in the augmented model

Variable	Type of "distance"	Description of variable	Data source
DIST	Physical	Great circle distance between capital cities	CEPII
BORDER	Physical	Takes value of "1" when countries have a common border	Geographical atlas
FTA	Political	Takes value of "1" when countries signed a FTA (including CEFTA-2006)	Various sources
PERCAP_DIFF	Economic	Difference in GDP per capita	UNCTAD
RELIG	Cultural	Sum of differences of shares of three main religions	www.worldmapper.org
LANG	Communicational	Index representing probability that two randomly chosen persons will be able to communicate, weighted by similarity of languages	www.ethnologue.com
WAR	Historical	Takes value of "1" if countries were in state of war in the given year[18]	Uppsala University
WAR+X ("X" taking values 1-5)	Historical	Takes value of "1" if countries had been in state of war x years before the given year	Uppsala University

Source: Own concept. For the detailed description of the LANG variable see Klimczak (2014a)

Political "distance" variable FTA reflected a situation where countries had a Free Trade Agreement signed or both underwent a higher stage of the process of regional integration. In the case of the Western Balkans before 2013, this meant either bilateral trade agreements or joining CEFTA-2006. The issue of bilateral

[18] In the case of the Kosovo war, the indexes WAR and WAR+X apply to Albania.

trade liberalisation comes into meaning, as two authors came up with two totally different conclusions for the WBs. Ilić (2012) proved that Serbia exports more to CEFTA-2006 countries than to other countries. On the other hand, Damijan et al. (2006) found little effect of the trade liberalisation in the region from 1996 – 2000, as well as a minor expected influence on trade of the planned signing of CEFTA-2006.

The economic "distance" was represented by a variable PERCAP_DIFF, a difference in GDP per capita, which proxied relative factor endowments (capital/ labour) of the countries. According to the New Trade Theory, countries that are similar in economic development (and factor endowments) tend to trade more with one another. Thus, a high value of the variable's coefficient would indicate H-O type of trade between countries.

Two variables representing cultural and communicational "distance", RELIG and LANG respectively, were described in the previous section.

A series of historical "distance" variables were included in the study. Unlike frequently used colonial links, not applicable to this particular research, more important seemed to be the effects of the wars and military conflicts which the region suffered in the 1990's. In the literature, there appear three ways the effects of historical conflicts are included in trade modelling:

- as mutual reluctance being an outcome of the even far away conflicts (Guiso et al. 2004; Melitz and Toubal 2012, Sarkees and Wayman, 2010);
- as a real barrier to trade connected with warfare in the current (analysed) year (Martin et al. 2005);
- as a real barrier to trade connected with warfare in the current (analysed) year or a number of years after the end of the war (Klimczak, 2014a).

In this research, the latter one was applied for two reasons. Firstly, it does not equate conflicts which happened hundreds of years ago with conflicts from the recent past. Secondly, it captures the effects of the post-war periods which, intuitively taken, still have a negative effect on business relations between the previously conflicted countries.

Apart from the distance-type variables, stock of the foreign direct investment in the exporting country (FDI) was added to the model (regardless of the investment's country of origin). It can proxy technological advancement of a transition economy. However, the theory does not give a clear hint, whether to expect rise or decrease of trade values as a consequence of foreign direct investments. They can substitute trade with certain goods previously exported from the investing country, but on the other hand they can boost exports of these goods to the third countries (Fontagné and Pajot, 1997). The impact much depends on the type of the FDI – horizontal

investments may restrain trade, whereas vertical ones may cause its increase, but mostly with the investing country (Camarero and Tamarit, 2003). As for the SEE region, Mehić and Babić-Hodović (2011) show positive and statistically important impact of the FDI on the SEEs exports. However, the latter study focuses on total exports, whereas our research is about intra-regional trade.

The dataset used in the analysis deserves an explanation. There was a lack of data for some of the trade flows, namely from Albania to Bosnia (years 1995 – 2000), from Bosnia to Albania (1995 – 1996) and from Croatia to Yugoslavia (1995). As these constituted just nine observations, they were simply not estimated. No zero-flaws occurred in the dataset, as we worked on the aggregated values, which on the other hand could have led to an aggregation bias. Further research is welcomed in order to see results for disaggregated flows. As for the other data limitations, the sources of religion and language data were usually limited to just one year and did not cover all countries of interest, so there was a necessity to transfer the data on religion and language from Serbia to Montenegro and to Serbia & Montenegro (or Federal Republic of Yugoslavia). Finally, the used dataset did not encompass Kosovo due to a complete lack of comparable data[19].

5. Results and discussion

The results of the model which included additional variables proved to be well-fitted to data, with the adjusted R-squared values in *pooled* and *fixed effects* specifications 0.82 and 0.89 respectively[20]. Furthermore, only 0.07 pp difference between the two specifications (*pooled* and *fixed*) suggests a significant part of the bilateral effects (meaning "distance") to be covered by the proposed explanatory variables.

In order to evaluate which model specification (*pooled, fixed* or *random effects*) was best suited to the empirical data, a series of three tests was conducted. At first, a test was run on differing group intercepts. According to the null hypothesis, groups have a common intercept. The test statistics provided: $F(35, 326) = 7.76$ with p-value = $P(F(35, 326) > 7.76) = 2.90067e\text{-}026$. This brought a conclusion that the null hypothesis was rejected, which meant the *fixed effects* model was more appropriate then the *pooled* one. In the next step, the Breusch-Pagan test was run to verify a hypothesis, that variance of the unit-specific error = 0. Test results showed asymptotic test statistic: Chi-square = 147.566 with p-value = 5.90087e-034, proving that the *random effects* model suited data better than the *pooled* one.

[19] The model was tested for multicollinearity and for existence of outliers and it appeared robust. All results available upon request.

[20] Regressions were computed with the use of the GRETL 1.9.6. cvs software.

Table 3: Estimation results

Estimation type	Pooled – OLS	Fixed effects	Random effects
const	-11.98 (20.07)	62.03** (28.64)	-20.47 (17.52)
GDP exp	1.70*** (0.59)	2.63*** (0.50)	2.75*** (0.52)
POP exp	0.45 (0.26)	2.04*** (0.45)	0.09 (0.34)
GDP imp	-0.79*** (2.48)	-1.86 (2.12)	1.09*** (2.13)
POP imp	-0.63** (0.27)	-9.62 (2.10)	-0.73** (0.34)
DIST	0.23 (0.27)	***7.22**** ***(0.90)***	-0.03 (0.44)
PERCAP_DIFF	-0.24*** (0.06)	-0.06 (0.06)	-0.09 (0.06)
BORDER	1.09*** (0.19)	***5.17**** ***(0.70)***	1.13*** (0.33)
RELIG	0.66 (0.46)	***9.19**** ***(1.40)***	1.94** (0.76)
LANG	5.13*** (0.52)	***10.64**** ***(1.90)***	4.87*** (0.98)
FTA	0.93*** (0.20)	0.22 (0.17)	0.41** (0.17)
WAR	-1.52*** (0.44)	-1.10 (0.35)	-1.33*** (0.37)
WAR+1	-3.31*** (0.46)	-2.51 (0.36)	-2.67*** (0.38)
WAR+2	-0.32 (0.37)	-0.08 (0.29)	-0.16 (0.30)
WAR+3	-0.41 (0.37)	-0.24 (0.29)	-0.29 (0.30)
WAR+4	-0.63* (0.36)	-0.23 (0.29)	-0.35 (0.30)
WAR+5	-0.21 (0.36)	0.10 (0.29)	0.02 (0.30)
FDI	-0.08 (0.11)	-0.12 (0.10)	-0.04 (0.10)
No. of observations:	375	375	375
R-squared:	0.828294	0.906305	n/a
Adjusted R-squared:	0.817043	0.892509	n/a

Note: * significant at 10%; ** significant at 5%; *** significant at 1%. Values written in bold italics come from the second stage of the analysis following the methodology presented by Cheng and Wall (2005).

Source: Own calculations

At the end, the Hausman test was carried out to see if the *fixed effects* model was more appropriate than the *random effects* model. The null hypothesis suggested that the GLS estimates used in the *random effects* model are consistent. Asymptotic test statistic: Chi-square = 63.295 with p-value = 1.34284e-008 showed that the null hypothesis should be rejected and thus the *fixed effects* model would be more appropriate than the *random effects* one.

Regarding the interpretation of the variables which were suspected of having an influence in trade values, we would concentrate on the ones augmenting the standard model, because the influence of GDP, population and distance between main cities on trade between countries is widely known. The first additional variable, representing the physical "distance", was BORDER. This binary variable took value of "1" in the instances when the countries are adjacent. In the *fixed effects* model, as time-invariant, the variable had to be estimated using the ChW method, which brought a statistically important value of the coefficient of 5.17. For the other two models, it also showed statistical importance at $p < 0.01$ and a positive influence on export (1.09 in *pooled* and 1.13 in *random effects* model).

Being a representative of the economic "distance", the absolute value of the difference in GDP per capita of trading partners describes not only the difference in their welfare and in the stage of development, but also in factor endowments (labour/capital). As for the relatively poor countries, a big difference in factor endowments should stimulate inter-industry trade, which was empirically confirmed for Serbia's trade by Bjelić and Dragutinović Mitrović (2012). The regression results of this study were contradicting this thesis. Just in the *pooled* model was the variable statistically important. Its coefficient values were negative and close to zero (-0.24; -0.06 and -0.09 for *pooled*, *fixed* and *random* models respectively). Comparable value of this variable's co-efficient were estimated for the CEFTA-2006 countries in the model of Begović (2011).

The variable constituting the cultural "distance", similarity of religious structures (RELIG), in the *fixed effects* model, was estimated with the ChW method and the value of its coefficient was 9.19. In the *pooled* model this variable appeared to have a positive (0.66), though statistically not important influence on the value of export. However, in the *random effects* model, this influence was stronger (1.94) and statistically important by $p < 0.1$. These results can be interpreted in a way that similarity in religious structures is one of the key determinants of trade values and directions in the region of the Western Balkans[21]. As previously mentioned, the region lies on the joint of the three big religions: Catholicism, Orthodoxy and Islam, so the high value of the coefficient standing by the RELIG variable indicates problems which have to be overcome by exporters who want to compete successfully on a market that is different in terms of a dominant religion.

[21] As the *pooled* model proved to be the least relevant out of all three specified in this paper.

Another variable which was important for the purpose of this research was the ability of people in different countries to communicate directly (LANG). The variable is the sole representative of the communicational "distance". In the research, it appeared to be statistically important, and its coefficients had the highest values of all the examined variables. In the *pooled* model it accounted to 5.13, whereas in the *random effects* model to 4.87). Like in the case of the RELIG variable, estimation by the ChW method produced a very high value of the coefficient – 10.64. It means that communicational barriers belong to the most important obstacles in trade in the region. This finding reconfirms recent results of Begović (2011), Fearon (2003), Guiso et al. (2004), Laitin (2000), Melitz (2008) or Melitz and Toubal (2012).

The political "distance" was represented in the research by the binary variable FTA, taking the value of "1" in instances when the countries had signed a Free Trade Agreement. The variable proxied trade liberalisation, which is one of the most common potential trade determinants in the literature. In this research, the coefficients took positive values regardless of the type of model, 0.93, 0.22 and 0.41 for *pooled, fixed* and *random effects* respectively. In the *pooled* and *random effects* models it was statistically important, whereas in the *fixed* effects model it was not, which slightly mitigated earlier prognoses of Herderschee and Qiao (2007) of a hidden potential which was supposed to be revealed while signing of the CEFTA-2006 by the countries of the region. Those results show that the trade liberalisation process, which was expressed in signing of the bilateral Free Trade Agreements and CEFTA-2006, had positive influence on trade values. However, when taking into account all bilateral effects for country-pairs (the *fixed effects* model), it wasn't statistically important.

The last potential distance-type determinants of export were six binary variables describing a state of war between countries (WAR) or a number of the following years after its end (WAR+1 to WAR+5). As expected and in accordance with findings of Adam et al. (2003), in all three models their coefficients had negative signs. Their highest values and statistical importance were recorded by WAR+1 and WAR. One could think why after the years that followed the end of a war, represented by variables WAR+2 to WAR+5, appeared to have small and statistically not important impact on trade[22]. Those results could be interpreted in a way that warfare has an impact on trade relations between countries, but when possibilities of its revival are seen, entrepreneurs tend to overcome mutual animosities.

The last variable was the stock of the Foreign Direct Investments (FDI) in the exporters country, which proxied the country's "mass" as a "technology" potential. The results showed that regardless of the model, the variable took negative values

[22] Exceptions were statistically important variable WAR+4 in the *pooled* model, and positive signs by the variable WAR+5 in the *fixed* and *random effects* models.

between -0.12 (in the *fixed* model) and -0.04 (in the *random effects* model), and that in neither of cases was the coefficient was statistically important.

6. Conclusions

The presented results of our analysis proved the main working hypothesis which stated that there were more than just geographical, economic and political factors that influenced trade among the Western Balkan countries over the time period from 1995 – 2012. However, not all of the auxiliary hypotheses, which were appointed to certain types of "distance" (communicational, cultural, and historical) and their specific impact on trade values, were proven to be significant. The ability of the citizens to communicate directly and similarity of religious structures were the two auxiliary factors that proved to determine the trade values the most. Moreover, the time of war and one year after had a strong and statistically significant influence on trade, as well as the fact of signing of a free trade agreement between countries. On the other hand, the auxiliary hypothesis about the importance of foreign direct investments and further post-war periods did not prove valid as trade determinants. These conclusions about language, religion and historical factors having significant influence on trade among the WB countries contribute to contemporary science, and so do the methodological aspects of categorization of the notion of "distance" in trade and particular measurement methods of language and religious proximity. The new facts obtained in this research as the contribution to the economic literature are that the ability of the citizens to communicate directly in their mother tongues and similarity of religious structures of the societies enhance trade values between countries. On the other hand, just the opposite effect is brought by warfare, but in only one year after the peace is achieved both previously conflicted countries continue to trade as usual.

A number of data limitations occurred in the research process. Lack of data for early years of the analysis also occurred in the case of export values between some of the countries (mostly from Albania to Bosnia). However, it represented just a small part of the database. Another limitation was the necessity of transferring the data on religion and language from Serbia to Montenegro and to Serbia & Montenegro (Federal Republic of Yugoslavia). Finally, Kosovo was not taken into account at all, due to a complete lack of comparable data.

The study did not, by any means, close the subject of trade determinants in the region of the Western Balkans. Further research should especially encompass issues of internal distance and multilateral distance, which were not raised here. On the other hand, in order to capture the specifics of different types of goods, a similar analysis could be run with a division for intra/inter-industry trade, final/intermediary goods or with a breakdown for different SITC categories. Each of

these would cast light on determinants of trade in certain types of goods. In the present times, when trade is subject not only to differences in factor endowments, but also a strong fragmentation of production and growing differentiation of goods, this proposed direction of further research could bring interesting results.

The study points towards the importance of communication for trade issues, whether it be the straight forward possibility of understanding one another in terms of language, or an intercultural dialog focused on improving tolerance to the other party's beliefs. Policy implications of this research imply using all measures in hand to work on regional dialogue that would enhance multilateral understanding, tolerance, and diminishing of formal and informal barriers to trade.

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Odrednice intra-regionalne trgovine Zapadnog Balkana

Jelena Trivić[1], *Łukasz Klimczak*[2]

Sažetak

Cilj ovog rada je identificirati čimbenike koji imaju utjecaj na bilateralnu trgovinu između zemalja Zapadnog Balkana u razdoblju od 1995. – 2012. godine. Za razliku od većine radova koji se bave problematikom međusobne trgovine zemalja Balkana ili zemalja Jugoistočne Europe, osim zemljopisnih, ekonomskih ili političkih čimbenika u radu su uzeti u obzir i čimbenici koji se odnose na kulturološke, komunikacijske i povijesne tipove varijabli, a koji čine takozvanu „udaljenost" između zemalja. Kako bi se procijenio njihov utjecaj na trgovinu, korišten je proširen gravitacijski model koji je ocijenjen trostruko: kao model grupiranih OLS podataka, kao model slučajnih efekata i kao model fiksnih efekata s dodatnom procjenom vremenski nepromjenljivih varijabli u skladu s metodom u Cheng i Wall (2005). Rezultati istraživanja su iznenađujući, s obzirom da su najjači utjecaj na vrijednosti trgovine imale varijable koje predstavljaju jednostavnost izravne komunikacije i religijske sličnosti. Također, varijabla rata i varijabla jednogodišnjeg post-ratnog efekta pokazali su snažan i statistički značajan utjecaj. Dakle, glavni je zaključak da u regiji Zapadnog Balkana ne-ekonomski faktori igraju najvažniju ulogu u određivanju vrijednosti trgovine između zemalja.

Ključne riječi: *odrednice trgovine, Zapadni Balkan, gravitacijski model, panel podaci*

JEL klasifikacija: *F14, F15, C23*

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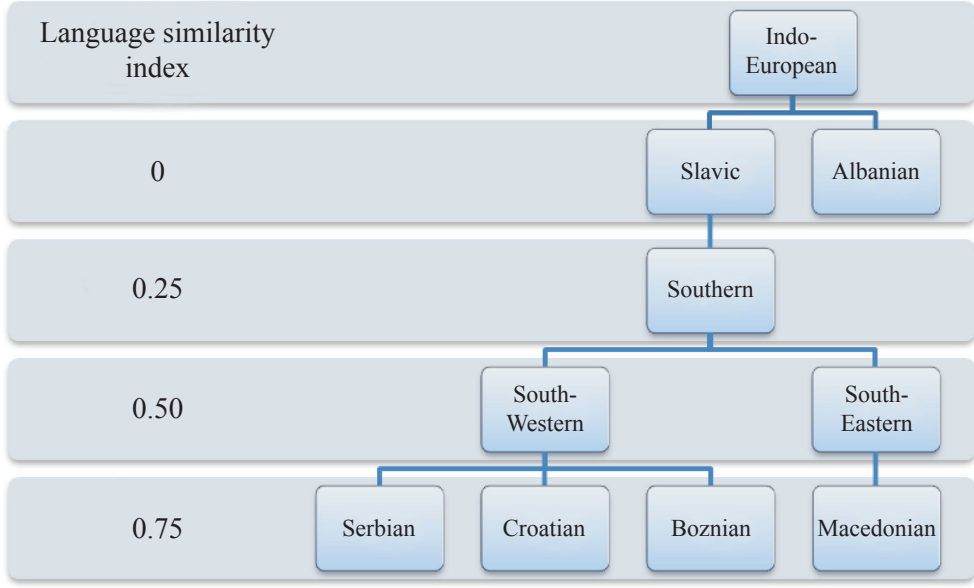
Appendices

Appendix 1: An example of the matrix of percentage products of shares of people speaking each of the main five languages – the case of Albania and Bosnia and Herzegovina

Country			Albania				
	Languages		Albanian	Bosnian	Croatian	Serbian	Macedonian
		Share	0.87	0	0	0.09	0.04
Bosnia	Albanian	0	0	0	0	0	0
	Bosnian	0.51	0.44	0	0	0.04	0.02
	Croatian	0.12	0.10	0	0	0.01	0.01
	Serbian	0.37	0.32	0	0	0.03	0.02
	Macedonian	0	0	0	0	0	0

Source: Own calculations based on the data from www.ethnologue.com (30.09.2013)

Appendix 2: The language tree as a base for construction of the language similarity index

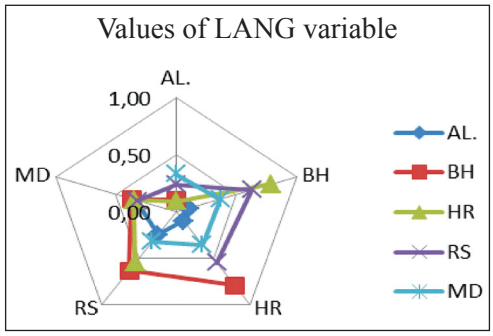


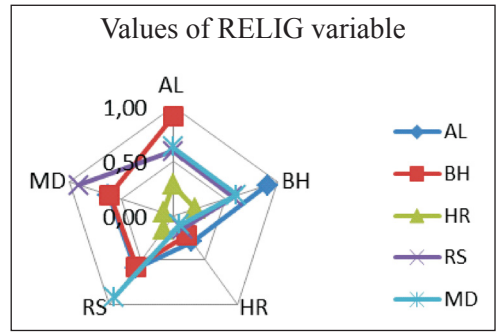
Source: Own concept based on the data from www.ethnologue.com (30.09.2013)

Appendix 3: Values of indexes of LANG and RELIG variables

Exporter	Albania				Bosnia and Herzegovina				Croatia				Serbia*				Macedonia			
Importer	BH	HR	RS	MD	AL	HR	RS	MD	AL	BH	RS	MD	AL	BH	HR	MD	AL	BH	HR	RS
LANG	0.11	0.10	0.24	0.34	0.11	0.79	0.63	0.37	0.10	0.79	0.55	0.35	0.24	0.63	0.55	0.32	0.34	0.37	0.35	0.32
av. LANG	0.19				0.47				0.45				0.44				0.34			
RELIG	0.91	0.29	0.59	0.63	0.91	0.21	0.58	0.61	0.29	0.21	0.14	0.10	0.59	0.58	0.14	0.92	0.63	0.61	0.10	0.92
av. RELIG	0.60				0.58				0.19				0.56				0.56			

Note: * Values of LANG and RELIG indexes for Serbia are also used for Montenegro





Source: Own calculations