

## **Determinants of Intra-industry Trade between Western Balkans and EU-15: Evidence from Bilateral Data**

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### **Abstract**

*This paper provides analysis of intra-industry trade determinants between Western Balkan countries and old European Union Member States. Overall intra-industry trade has been analysed, as well as its horizontal and vertical component, within bilateral trade framework. All components of intra-industry trade exhibit much lower degree than EU New Member States achieved during their accession period. Most of the intra-industry trade is related to vertical component, while horizontal component is negligible. Intra-industry trade determinants analysis has revealed that relative income level, distance, relative factor endowments and relative trading costs are significant factors for the analysed countries' trade relations. The determinants of vertical component are the same, although for some variables smaller significance levels were found. Horizontal component determinants in general have the same sign, although relative income levels, employment shares and export costs were not found significant.*

**Keywords:** intra-industry trade, vertical intra-industry trade, horizontal intra-industry trade, Western Balkans, EU accession

**JEL Classification:** F14, F15

### **1. Introduction**

Western Balkan countries belong to the group of European transition economies, but their relative performance falls behind more advanced transition economies. Even though these countries are facing numerous problems, one of persistent issues is relative lack of competitiveness and inability to improve their position on international market. This fact might be very important in the near future since Western Balkan countries are<sup>2</sup>, with exception of Iceland, next in line for EU integration. Thus, their relative position in trade with European Union gives some indications on the abilities of these countries to

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<sup>2</sup> The factors behind relative slow progress in regional integration of Western Balkan countries has been analyzed in Sklias (2011).

participate actively in the common market. So far, the available data indicates that Western Balkan countries' trade with EU is fairly stagnant, contrary to predictions of a successful integration processes.

Not only that trade increases are important, but the types of goods traded between the countries also play significant role in countries' development prospects (Hidalgo et al., 2007). The analysis of trade patterns enables gaining important insight into underlying dynamics of a group of countries within a trade network. Western Balkan countries are frequently considered to be similar to other transition economies that became EU New Member States in 2004 and 2007. The analysis below points to certain differences between these two groups of transition economies, and thus calls for additional alertness when designing policy measures related to Western Balkan countries' trade promotion.

In order to analyse trade patterns, the paper focuses on intra-industry trade (IIT) dynamics. Intra-industry trade refers to simultaneous imports and exports, recorded at a detailed level of product aggregation. If there are no simultaneous imports and exports recorded, than the trade between two countries is considered to be inter-industry. Since the seminal work of Balassa (1966) and Grubel and Lloyd (1975), a considerable amount of literature analysing intra-industry trade has been produced. The attention to this issue has most recently been drawn within the analysis of EU accession process, related to the smooth adjustment hypothesis. The hypothesis states that if intra-industry trade has higher share in the overall trade between the countries, the integration associated adjustment costs will be less severe than in cases when the share of inter-industry trade is higher. Azhar and Elliot (2008) offer following explanation for this argument. The increases in trade will result in changes in imports and export on a sector/product level. If the trade patterns are for the most part inter-industry in nature, than these sector changes will be reflected in transferring production resources between industries, from contracting to expanding industries. If there are large differences in relative production factor endowments of the two trading countries, the costs of adjustments from one industry to another will be higher. From the Western Balkan countries' perspective, this hypothesis implies that changes in trade patterns could have significant structural impact on their economies within the EU integration process.

Integration process should theoretically increase trade (and consequently growth) prospects, which is in particularly interesting for transition economies in their catching-up aspirations. Due to the capability to address this phenomenon empirically, literature exploring trade patterns during EU accession is rather extensive. The literature on trade patterns within the context of EU integration is relatively abundant for Central and Eastern European Economies (Aturupane, Djankov and Hoekman, 1999; Caetano and Galego, 2007; Firdmuc, Grozea-Helmenstein and Wörgötter, 1999; Gabrisch, 2006; Kandogan, 2003; Hoekman and Djankov, 1996; Firdmuc, 2005; Janda and München, 2004). Similar analysis for Western Balkan countries is relatively scarcer, with some exceptions (Damijan, de Sousa and Lamotte, 2006; Kaminski and de la Rocha, 2002; Mardas and Nikas, 2008; Buturac and Teodorović, 2012).

The main contribution of the present paper is that the analysis of trade patterns determinants between European Union and Western Balkan countries relies on a more

detailed level of trade data aggregation than previous studies. Since methodology applied to more aggregated data can give misleading results, previous findings for Western Balkan countries in general indicate more integrative factors with European Union, which could have serious policy implications. Additional contribution comes from the fact that Western Balkans' bilateral trade patterns determinants with European Union members are analysed, while previous literature predominately treats European Union as a single entity.

Western Balkan countries analysed in the paper are: Albania, Bosnia and Herzegovina (B&H), Croatia, Former Yugoslavian Republic of Macedonia (FYRM), Kosovo under UNSCR 1244/99 (Kosovo), and Montenegro and Serbia, all considered as separate entities. European Union is represented by 15 old Member States.

The structure of the paper is following. Next section presents data, methodology and the results of estimating IIT, vertical IIT (VIIT) and horizontal IIT (HIIT). Section 3 presents estimation strategy, results and discussion on IIT, VIIT and HIIT determinants. Last section brings conclusions.

## **2. Estimating IIT, VIIT and HIIT: methodology and results**

European Union represents major trading partner for Western Balkan economies, although contrary to expectations the trade relationships have not intensified with the integration process so far<sup>3</sup>. To investigate possible reasons for this stagnation, a deeper analysis of trade patterns between the two groups of countries is required. The focus of the analysis in this paper is on degree of intra-industry trade between Western Balkan countries and European Union. Early literature on intra-industry trade (Grubel and Lloyd, 1975) observed that it has a large share in trade of industrialized economies, contrary to the predictions of standard Ricardo and Heckscher-Ohlin theories, which emphasized dominance of inter-industry trade flows based on relative factor endowments.

Theoretical fundamentals for the intra-industry trade have been founded in the models proposed by Balassa (1966) and Krugman (1979). Also, Lancaster (1980) and Helpman (1981) are prominent early contributions aimed at explaining the existence of intra-industry trade, with seminal Helpman and Krugman (1985) book providing synthesis theory.

In addition to theoretical models, much of energy in the literature related to intra-

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<sup>3</sup> Eurostat data show that in 2010, which is the last year of the analyzed period in this paper, EU-15 had 66.1 percent share of exports in Albania, 40 percent in Bosnia and Herzegovina, 44.6 percent in Croatia, 46.8 percent in FYR Macedonia, 37.9 percent in Montenegro and 35.8 percent in Serbia. Comparable figures for imports are 56.4 in Albania, 30.9 percent in Bosnia and Herzegovina, 45.1 percent in Croatia, 38.6 percent in FYR Macedonia, 29.7 percent in Montenegro and 34.2 percent in Serbia. The data on other trading partners for Kosovo were not available, so there are no estimates on the EU share in total. The dynamics of both exports and imports in the analyzed period is presented in Botrić (2012), where interested reader can also find following: IIT estimates for EU-15 and EU-NMS with Western Balkan countries on overall EU-level, separation of VIIT into up-market products and down-market products, as well as discussion on marginal intra-industry trade.

industry trade is devoted to the issue of measurement and appropriate classification of the overall trade into its intra (trade of products produced within the same industry) and inter-industry (trade of products from different industries) component. Thus, many proposed methodologies exist, starting by most frequently used Grubel and Lloyd (1975) index. Another well known examples include Balassa (1966), Greenaway and Milner (1983), Aquino (1978), Hamilton and Kniest (1991), Greenaway et al. (1994), or Brühlhart (1994).

Within the intra-industry trade, of special interest is the type of products traded. The whole intra-industry trade is thus further disaggregated into horizontal intra-industry trade (which is the trade of relatively close substitute products within the same industry) and vertical intra-industry trade (which is the trade of differentiated products within the same industry). The beginning of theoretical foundations for horizontal intra-industry trade (HIIT) can be found in Helpman and Krugman (1985), while the modelling of vertical intra-industry trade (VIIT) has been initiated by Caves (1981). Vertical intra-industry trade models can be associated either with consumer demand for different product qualities (Falvey and Kierzkowski, 1987) or segmentation of production process across regions as a result of multinational activities (Markusen and Venables, 2000). Theoretical models inspired VIIT and HIIT empirical estimation. One of relatively frequently used method for that purpose relies on the unit values (value per ton of good) of exports and imports relationship on a detailed level of product aggregation. The idea traces its origin to the Stiglitz (1987) assumption that relative prices of goods reflect their relative qualities.

In order to examine trade patterns between Western Balkan countries and European Union old member states, an overall trade has been disaggregated using Grubel-Lloyd index, which can be assessed according to following expression:

$$GL_i = \frac{(X_i - M_i) - |X_i - M_i|}{(X_i + M_i)} \quad (1)$$

Where X refers to exports, M to imports. The whole expression can be multiplied by 100 to obtain index, which ranges from 0 to 100. If at the particular level of aggregation the expression is above 0.5 (or the index is above 50), the trade is considered to be intra-industry. Grubel-Lloyd index has been challenged in the literature (Hamilton and Kniest, 1991; Brühlhart and Elliot, 1998) for its ability to disentangle trade patterns especially in the cases of transition countries, which usually have large trade disbalances as well as structural changes. Nevertheless, empirical investigation of the IIT determinants in our case relied on this relatively widespread indicator for two reasons. The first one is related to its frequency of use in the literature. We argue that relying on more widespread indicator provides more points of comparisons to the previous studies on other transition economies. The second argument relates to the relatively short period under analysis. Considering, for example, marginal intra industry trade indicators would imply reducing one year of observation, which would reduce the panel dataset significantly in our empirical exercise. Thus, these extensions are left for future research.

In order to distinguish between HIIT and VIIT, a standard unit value approach has been applied in the paper (Fontagné and Freudenberg, 1997). A ratio between unit value of exports and unit value of imports has been evaluated against a threshold according to the following expression:

$$\frac{1}{1+\alpha} \leq \frac{\text{Unit value of exports}}{\text{Unit value of imports}} \leq 1+\alpha \quad (2)$$

Horizontally differentiated products are those for which the evaluated ratio of unit values falls between the specified borders, implying that the differences between unit values of exports and unit values of imports for that product are small. Vertically differentiated products are those for which the unit value ratio falls outside the borders, implying that either the goods from the home market are at the lower end of the EU market (unit value ratio is below the lower boundary) or they are up-market goods (for those whose unit value ratio exceeds  $1+\alpha$ ).

Unit values have been calculated as the ratio of the value of trade in EUR and a corresponding quantity in tons. Threshold value  $\alpha$  has been set to 15 percent, which is a frequently utilized value, although not unchallenged (Kandogan, 2003) in the literature. According to Crespo and Fontoura (2004), the unit value approach has a number of shortcomings. First, consumers may buy expensive products for reasons other than quality, an argument which might be in particular relevant for the transition economies entering new markets. Second argument Crespo and Fontoura (2004) mention is that values of two bundles may differ if the mix of products differs, so that one bundle contains a higher proportion of high unit value items than the other. Finally, this approach can theoretically be consistent if analyzed at a very detailed level of product aggregation, to be able to claim that the products traded are similar. This argument governed the decision to conduct the analysis presented below at the most detailed level of aggregation the data would allow.

The described indicators were calculated based on the Eurostat's trade database, COMEXT. The major reason for relying on this data source is the lack of disaggregated data from the national statistics offices that would enable comparative analysis. The original data are thus represented from the EU countries' perspective. The indicators presented below are, however, from the perspective of Western Balkan countries. However, the overall trade volume used for the analysis between the EU and Western Balkan countries is the same, regardless of the country of origin, since the same data source has been used throughout the paper.

The analysis is performed on the 8-digit level of Combined Nomenclature<sup>4</sup>. This approach has been taken due to the fact that results can be highly sensitive to the level

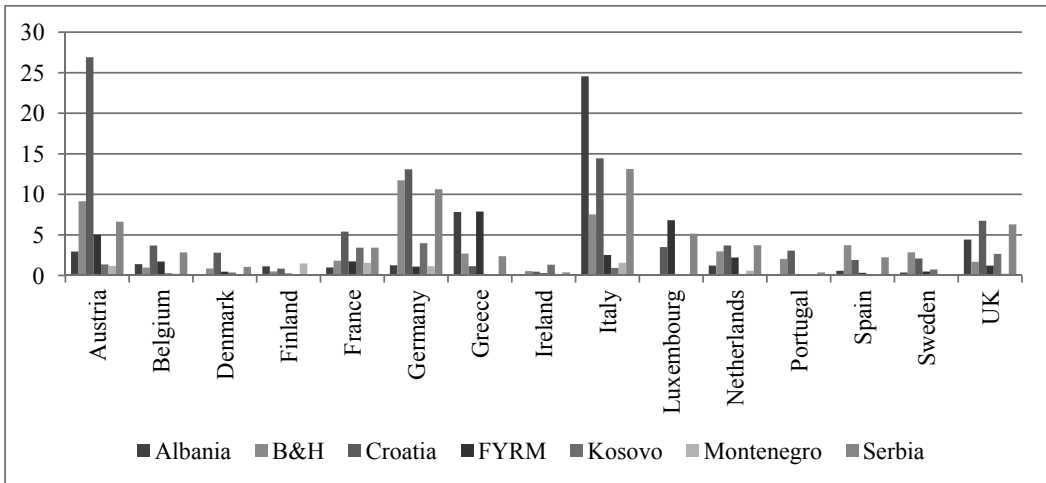
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<sup>4</sup> Estimated IIT on the 8-digit level is systematically lower than IIT on, for example, 6-digit level or 4-digit level for the analyzed countries in the analyzed period. In order to save space, we present only the 8-digit level data. IIT data on other levels of aggregation is available from the author upon request.

of disaggregation (Gullstrand, 2002), in particular in transition economies where the trade patterns are rapidly evolving. Thus, we follow the Sawyer, Sprinkle and Tochkov (2010) advice, who claim that the best solution is to calculate the IIT at as high level of disaggregation as the data permits.

Methodology described has been applied to the available dataset with the aim to provide the longest available series for IIT determinants' analysis. This approach has resulted in indicators available since 1988 for Albania, 1992 for Bosnia and Herzegovina and Croatia, 1993 for FYRM and 2005 for the remaining three countries. Due to the intention to treat all the countries as separate entities, comparison among Western Balkan countries is available only for the 2005-2010 period. The reason is that Montenegro and Serbia became separate entities in 2006, and Kosovo proclaimed its independence in 2008. Having in mind all this restrictions, we present average bilateral IIT for the whole analysed period in Figure 1.

**Figure 1: Share of IIT in trade between Western Balkan countries and European Union old member states, Grubel-Lloyd methodology, 2005-2010 average, in percent**



**Source:** author's calculations based on COMEXT database.

The share of intra-industry trade in overall trade between Western Balkan countries and European Union is relatively low, even when compared to other transition economies (Fainštein and Netšunajev, 2011). The highest share is between Croatia and Austria, followed by Italy and Albania. Italy and Germany, and somewhat less Austria, have relatively more IIT with several countries. These are also the most important trading partners of Western Balkan countries. For most of the cases, IIT share in overall trade is negligible.

The trade between the two groups of countries thus resembles more traditional North-South trade pattern, than the trade between the developed industrialized countries. This is additionally substantiated when overall IIT is disentangled into its vertical and

horizontal component. Specifically, within the intra-industry trade, vertical trade share is more dominant, reflecting that the trade in differentiated products is more widespread than the trade in similar products within the same industry. Such trade patterns point to the possible increased difficulties of Western Balkan economies within the integration process. In the next section we explore the determinants of such relatively low IIT shares.

### **3. IIT, VIIT and HIIT determinants: estimation strategy, results and discussion**

In order to analyze the determinants of trade patterns between European Union old member states and Western Balkan countries, we estimate separate equations for three different measures of intra-industry trade: overall IIT, vertical component and horizontal component. Theoretical models as well as previous empirical findings suggest that determinants of VIIT and HIIT differ. Due to the data availability constraints, we consider and include in the analysis only a subset of possible determinants previously discussed in the literature. The reason for their inclusion in specification is explained below in more details, while the data sources of the explanatory variables can be found in the Appendix.

Even though the dependent variable by construction falls between zero and 1, which violates the assumption that the error term should follow a normal distribution, transforming the variable by the usual approach in the literature (i.e. logistic transformation) would in the case of our pairs of countries produce a large number of missing values. Since the main goal of the present paper is to estimate the determinants of IIT using all available information, we rely on the arguments proposed by Greenaway and Milner (1986) and proceed with the original values of dependent variable.

Three dependent variables - IIT, HIIT and VIIT between a Western Balkan country and an EU-15 country - were tested for the unit root presence. Im-Pesaran-Shin test was applied, due to the fact that we can consider both  $N$  and  $T$  fixed in our sample, which does not have to be balanced and we want to allow panel specific unit root processes. In all three cases,  $t$ -bar statistics was below the 1 percent critical value, indicating a strong rejection of the null hypothesis that all series contain a unit root. Thus, we proceed with specifying dependent variable in levels.

Models explaining intra-industry trade determinants usually consider differences in stages of economic development between the countries, differences in relative factor endowments, relative distances between the countries (Bergstrand, 1990). Since intra-industry trade was first observed as a phenomenon between developed countries, we would expect that relative similarity of countries in terms of economic development would be positively associated with share of intra-industry trade. Same is expected for the horizontal segment of intra-industry trade, since it is more likely that similar countries will trade products of similar quality. Trade in vertically differentiated products is more likely to develop between unequal trading partners.

In addition to relative income levels, important factor in traditional models, but also models related to vertical IIT, are trading partners' factor endowments. Measuring relative factor endowments for Western Balkan countries can be considered quite a challenge, due

to data availability constraints. Thus, simple approach has been taken, that admittedly might mask a variety of underlying factors. Instead of trying to measure capital-labour ratio (Blanes, 2005; Faustino and Leitão, 2007) or skill of the labour force (Sawyer, Sprinkle and Tochkov, 2010; Zhang, van Witteloostuijn and Zhou, 2005), we have included two separate general indicators of available capital and available labour force.

We follow a fairly standard estimating procedure and include distance between the capital cities of the countries as a measure of trading costs (Blanes, 2005). Another frequently used proxy for a trading cost is border between the countries. In addition, Bergstrand and Egger (2006) propose and test a model that specifically includes trade costs and find that increases in trade costs reduce the overall share of intra-industry trade. Relying on their findings, we include two explicit measures of trade costs in the specification. We cannot, however, test all the propositions as specified in their model. Instead, we follow approach similar to Djankov, Freund and Pham (2010), and include relative time to import and relative time to export, also relative cost to import and relative cost to export as measures of implicit and explicit trading costs.

It is widely recognized in the literature that overall intra-industry trade determinants could differ from vertical and/or horizontal component. For example, Jensen and Lüthje (2009) argue that the effect of differences in factor endowments on VIIT depend on the size of economies, as well as industry structures and demand patterns. Having in mind previous discussion, Table 1 briefly summarizes predictions regarding the determinants analyzed in present paper.

**Table 1: Expected IIT, VIIT, HIIT determinants**

Variable	Expected effect of the variable on		
	IIT	VIIT	HIIT
Border (bor)	+	+ (?)	+
Distance (dist)	-	- (?)	-
Exportcost (EXcost)	-	- (?)	-
Exporttime (EXtime)	-	- (?)	-
GDPpc (gdp)	-	-	- (?)
Gross fixed capital (gfc)	+	+ (?)	+
Employment (empl)	+	+ (?)	+

**Source:** author's systematization. (?) implies that effect depends on other factors.

The share of intra-industry trade between two countries in our estimation strategy is expected to be a factor of relative income, relative factor endowments and relative trading costs. Following Zhang, van Witteloostuijn and Zhou (2005), most of the independent variables (border and distance excluding, for obvious reasons) were transformed using the following expression:



$$X = \left| (X_{WB} - X_{EU}) / X_{WB} \right| \quad (3)$$

In other words, the absolute difference between the indicator values in Western Balkan country and its trading EU member partner was divided by the value of the same indicator in Western Balkan country, to obtain relative indicator. Thus, relative distance between the trading partners was measured according to the different indicators. Following equation has been estimated for IIT, HIIT and VIIT:

$$\begin{aligned} IIT_{i,t} = & \beta_0 + \beta_1 bor_{i,t} + \beta_2 dist_{i,t} + \beta_3 EXcost_{i,t} + \beta_4 EXtime_{i,t} + \beta_5 gdp_{i,t} + \\ & + \beta_6 gfcf_{i,t} + \beta_7 \beta empl_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (4)$$

Where  $i=1, \dots, n$  denotes country and  $t=1, \dots, T$  denotes year.

The final equation does not include all considered variables. Specifically, relative time to import and relative costs to import were excluded to avoid multicollinearity. To estimate the equations panel GLS method<sup>5</sup> was chosen to allow for heteroskedasticity across countries, but also to correct for possible correlation between the independent variables and constant term (Jensen and Lüthje, 2009). The number of observations included in the analysis reflects the data availability constraints. Results of the estimation are summarized in Table 2.

The results presented in Table 2 corroborate the story that the trade between European Union old Member States and Western Balkan countries resembles more traditional trade patterns, than trade patterns between equally developed countries. This result can be also found in the case of other transition economies. Fainštein and Netšunajev (2011) explore a wider set of models (and more extensive set of explanatory variables) in their search for determinants of IIT between Baltic countries and European Union. For the trade between transition economies and old EU Member States, it seems that traditional trade models explain existing trade patterns relatively well.

According to theoretical models, HIIT is more likely to be observed between developed economies with similar factor endowments, while VIIT is more likely to be associated with different income levels (Falvey and Kierzkowski, 1987; Flam and Helpman, 1987). These theories suggest that vertical intra-industry trade is more likely to develop between countries with different relative income levels and differences in relative factor endowments. The analysis presented in previous table supports this view, since relative

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<sup>5</sup> Literature suggests that border and distance might be important determinants of intra-industry trade. This might be of additional importance for the relatively distant countries, such as, for example Albania and Sweden, both in our sample. Although fixed-effects method is frequently used in panel data analysis of countries, this method is not sustained with dummy variables, such as border and distance. Due to the fact that empirical studies of intra-industry determinants in Western Balkan countries are relatively rare in the literature, we opted for examining as many as possible explanatory variables. However, interested reader could get the results of fixed effects estimation from the author upon request.

**Table 2: IIT, VIIT, HIIT determinants in trade between Western Balkan and EU-15 countries**

Independent variable	Estimated coefficient (standard error)		
	IIT	VIIT	HIIT
Constant	0.094*** (0.004)	0.083*** (0.003)	0.010*** (0.001)
Border (bor)	0.064*** (0.007)	0.037*** (0.007)	0.021*** (0.004)
Distance (dist)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Exportcost (EXcost)	-0.009*** (0.003)	-0.007** (0.003)	-0.000 (0.001)
Exporttime (EXtime)	-0.020*** (0.004)	-0.016*** (0.004)	-0.004*** (0.001)
GDPpc (gdp)	-0.002*** (0.001)	-0.002*** (0.001)	-0.000 (0.000)
Gross fixed capital (gfc)	0.018*** (0.006)	0.012** (0.005)	0.002** (0.001)
Employment (empl)	0.006** (0.003)	0.004* (0.002)	0.000 (0.001)
Diagnostics			
Wald	846.28***	756.06***	153.23***
N	445	445	445

**Source:** author's estimates.

**Note:** \*\*\* significant at 1 percent, \*\* significant at 5 percent, \* significant at 10 percent. Robust standard errors in parentheses.

GDP per capita and relative employment rates are both significant for vertical intra-industry trade, but not significant for horizontal. Since the share of vertical IIT is also larger than the share of horizontal, the VIIT determinants dominate in the overall IIT estimates. Similar VIIT determinants have also been previously documented as being significant for European economies (Jensen and Lüthje, 2009).

We have to emphasize that every Western Balkan country has lower income level than any EU-15 country. Thus, indicator approaches zero when the economic distance between the two groups of countries is smaller. Negative sign of the estimated coefficient for the relative GDP variable is logical, meaning that the closer the countries are in terms of income level, more IIT and VIIT there will be between them. Income effect of horizontal IIT, although of the same size, was not found significant. This is the results on deficiencies

on both side of estimating equation: low share of horizontal IIT and low average GDP in Western Balkan countries.

Highly expected result is that distance has a negative, while having common border has positive effect on IIT and its components (Balassa, 1986). This is frequently interpreted in the transport costs context of the traded goods. Furthermore, production and demand patterns of neighbouring countries tend to be more similar than distance countries, reflecting among other things, cultural and historic influences as well. These factors could induce at least some horizontal intra-industry trade, which explains the significance of the estimated coefficient.

Two explicit measures of trading costs, i.e. relative time to export and relative cost to export, measure money costs which are important for trading partners, but in the case of transition economies the relaxation of relevant procedures might be even more important. One of the trade and growth impediments in transition economies, and in particular Western Balkan economies, is excessive and inefficient bureaucracy. This issue has been recognized and addressed on policy level by all the countries in the region, with the result of reducing unnecessary procedures, including those related to international trade. This is clearly visible in the dataset used for the analysis in this paper, with the effect that the relative reduction in export-related procedures has significant impact on IIT, VIIT and HIIT. This is not repeated in the case of relative costs, which are significant only in the case of IIT and to a lesser extent VIIT, and not significant for HIIT.

Relative factor endowments have the same sign in the cases of IIT, VIIT and HIIT, even though not always significant. The higher the relative share of investments in GDP in Western Balkan country in comparison to EU-15 member, the higher the share of intra-industry trade, but also vertical and horizontal intra-industry trade. Since capital is relatively scarcer factor of production in Western Balkan countries, and intra-industry trade is more likely to develop between the countries that have similar levels of development, this result is highly expected. It also emphasizes that in order to catch-up with the more advanced economies, Western Balkan countries should be more oriented towards investment promotion.

Additional factors might also exert significant role on intra-industry trade between the Western Balkans and European Union. One of these factors might be foreign direct investments and the role of multinationals (Egger, Egger and Greenaway, 2007). In order to substantiate this empirically, we would require the data on bilateral FDI flows for these countries, which are not very reliable or comparable across different data sources. Although FDI effects might play significant role in the integration of Western Balkan countries into common EU market, previous studies have established that foreign investors are less oriented towards the manufacturing sector in the region. This implies that relative size of FDI is not so important, as the individual sector in which it is invested. If foreign investors chose manufacturing sector, transfer the knowledge through FDI and increase average productivity in that sector sufficiently enough to ensure the competitiveness on the international markets, this will probably also result in more intra-industry trade. Whether more horizontal or vertical IIT, depends on the FDI type and investors' motives,

in accordance with the product life cycle theory (Vernon, 1966). Since more insight on this can be achieved from the analysis on individual industry level, rather than country level, reaching firm conclusions on the topic is left for future research.

However, comparative analysis of FDI in transition economies points to another issue addressed in this paper, and this is the labour market factor. FDI literature generally finds that relatively expensive labour force discourages investors (Bellak, Leibrecht and Riedl, 2008; Rasciute and Pentecost, 2010). Although relative wages in Western Balkan countries are not high, the question of average workers' skills and productivity remains. The findings in this paper imply that the higher the relative employment shares in Western Balkan countries, the higher the share of intra-industry trade. This relationship is significant for intra-industry trade, somewhat for VIIT and not significant for HIIT. Although Western Balkan countries are perceived as the ones in which labour intensive industries have comparative advantage, the potential for intensifying production in those industries is not fulfilled, which is mirrored in comparatively lower employment rates. Furthermore, transition has actually brought a deindustrialization process, which was combined with increased unemployment and decreased competitiveness of industrial production, not only on international but also on domestic market. This might be related to the trade liberalization effect, which has through the smooth adjustment hypothesis already resulted in labour market difficulties (Brühlhart and Elliot, 1998; Brühlhart, Elliott and Lindley, 2006; Fidrmuc, 2005). Thus, further integration of Western Balkan countries could either intensify the problems or the adjustment costs have already materialized during the earlier phases of transition.

#### **4. Conclusion**

Trade relations between European Union and Western Balkan economies are marked by prolonged period of stagnation. This is related to the competitiveness problems Western Balkan economies are facing, that mirror the underlying unresolved structural problems of these slow advancing transition economies. However, trade is an important integrating factor and analyzing its patterns and dynamic might be very important for future integration processes of these countries into the common EU market.

This paper has focused on the intra-industry trade and the analysis of its determinants. The intra-industry trade degree should indicate current stage of integration between the two economies, while the determinants analysis would point to the main issues reflecting relatively low degree of integrative trade patterns between the two groups of countries. The analysis has revealed that the trade patterns mostly follow standard North-South dynamics, with relative factor endowments still playing important role for these economies. The share of IIT is lower than during the EU New Member States accession, and within the IIT the vertical component is dominant, while the horizontal is negligible.

Empirical analysis of the IIT determinants has resulted with theoretically founded coefficients, which have also been important in empirical studies in other European transition economies. Specifically, IIT determinants analysis has revealed that relative

income level, distance, relative factor endowments and relative trading costs are significant factors for the analyzed countries' trade relations. The determinants of vertical IIT are the same, although for some variables with smaller significance level. Horizontal IIT determinants in general have the same sign, but are more frequently found insignificant. These findings substantiate the conclusion that the trade relations are predominately based on traditional trading models, and also point to the possibility of relative high adjustment costs related to the integration process.

Even though the analysis in this paper does not establish causal relationships between the specific IIT determinants and the established trade patterns, we could speculate that traditional policy recommendations given to the group of countries could eventually lead to the improvements in their competitive position, and also to more intra-industry trade. The question remains whether such structural changes could be made in the short run, prior to EU accession, to enable easier integration into the common EU market.

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### **References**

- Aquino, A., 1978, 'Intra-industry trade and inter-industry specialization as concurrent sources of International Trade in manufactures', *Weltwirtschaftliches Archiv*, 114, 2, pp. 275-296.
- Aturupane, C., Djankov, S. and Hoekman, B., 1999, 'Horizontal and Vertical Intra-Industry Trade Between Eastern Europe and the European Union', *Weltwirtschaftliches Archiv*, 135, 1, pp. 62-81.
- Azhar, A.K.M. and Elliott, R.J.R., 2008, 'On the Measurement of Changes in Product Quality in Marginal Intra-Industry Trade', *Weltwirtschaftliches Archiv*, 144, 2, pp. 225-247.
- Balassa, B., 1966, 'Tariff reductions and trade in manufactures among the industrial countries', *American Economic Review*, 56, 3, pp. 466-473.
- Balassa, B., 1986, 'Intra-Industry Specialization: A Cross-Country Analysis', *European Economic Review*, 30, 1, pp. 27-42.
- Bellak, C., Leibrecht, M. and Riedl, A., 2008, 'Labour Cost and FDI flows into Central and Eastern European Countries: A survey of the literature and empirical evidence', *Structural Change and Economic Dynamics*, 19, 1, pp. 17-37.
- Bergstrand, J.H., 1990, 'The Heckscher–Ohlin–Samuelson Model, the Linder Hypothesis

- and the Determinants of Bilateral Intra-Industry Trade’, *Economic Journal*, 100, 403, pp. 1216-1229.
- Bergstrand, J.H. and Egger, P., 2006, ‘Trade Costs and Intra-Industry Trade’, *Weltwirtschaftliches Archiv*, 142, 3, pp. 433-458.
- Blanes, J.V., 2005, ‘Does Immigration Help to Explain Intra-Industry Trade? Evidence for Spain’, *Weltwirtschaftliches Archiv*, 141, 2, pp. 244-270.
- Botrić, V., 2012, ‘Intra-industry trade between European Union and Western Balkans: A Close-up’, EIZ Working Paper, EIZ-WP-1202, July.
- Brühlhart, M., 1994, ‘Marginal intra-industry trade: measurement and relevance for the pattern of industrial adjustment’, *Weltwirtschaftliches Archiv*, 130, 3, pp. 600-613.
- Brühlhart, M. and Elliott, R.J.R., 1998, ‘Adjustment to the European single market: inferences from intra-industry trade patterns’, *Journal of Economic Studies*, 25, 3, pp. 225-247.
- Brühlhart, M., Elliott, R.J.R. and Lindley, J., 2006, ‘Intra-Industry Trade and Labour-Market Adjustment: A Reassessment Using Data on Individual Workers’, *Weltwirtschaftliches Archiv*, 172, 3, pp. 521-545.
- Buturac, G. and Teodorović, I., 2012, ‘The Impacts of Global Recession on Southeast European Countries’, *Eastern European Economics*, 50, 1, pp. 78-97.
- Caetano, J. and Galego, A., 2007, ‘In Search of the Determinants of Intra-Industry Trade within an Enlarged Europe’, *South-Eastern Europe Journal of Economics*, 5, 2, pp. 163-183.
- Caves, R.E., 1981, ‘Intra-industry trade and market structure in the industrial countries’, *Oxford Economic Papers*, 33, 2, pp. 203-223.
- Crespo, N. and Fontoura, M.P., 2004, ‘Intra-industry trade by types: What can we learn from Portuguese data?’, *Weltwirtschaftliches Archiv*, 140, 1, pp. 52-79.
- Damijan, J.P., De Sousa, J. and Lamotte, O., 2006, ‘The Effect of Trade Liberalization in South-Eastern European Countries’, The WIIW Balkan Observatory Working Papers, No. 070, August, Vienna: The Vienna Institute for International Economic Studies.
- Djankov, S., Freund, C. and Pham, C.S., 2010, ‘Trading on Time’, *The Review of Economics and Statistics*, 92, 1, pp. 166-173.
- Egger, H., Egger, P. and Greenaway, D., 2007, ‘Intra-Industry Trade with Multinational Firms’, *European Economic Review*, 51, 8, pp. 1959-1984.
- Falvey, R.E. and Kierzkowski, H., 1987, ‘Product quality, Intra-industry trade and (Im) Perfect competition’, Kierzkowski, H., ed., *Protection and Competition in International Trade. Essays in Honor of W.M. Corden*, Basil Blackwell, Oxford, USA, pp. 143-161.
- Flam, H. and Helpman, E., 1987, ‘Vertical product differentiation and north-south trade’, *American Economic Review*, 77, 5, pp. 810-822.
- Fainštein, G. and Netšunajev, A., 2011, ‘Intra-Industry Trade Development in the Baltic States’, *Emerging Markets Finance and Trade*, 47, 0, supp. 3, pp. 95-110.
- Faustino, H.C. and Leitão, N.C., 2007, ‘Intra-Industry Trade: A Static and Dynamic Panel Data Analysis’, *International Advance in Economic Research*, 13, 3, pp. 313-333.
- Fidrmuc, J., Grozea-Helmenstein, D. and Wörgötter, A., 1999, ‘East-West Intra-industry trade dynamics’, *Weltwirtschaftliches Archiv*, 135, 2, pp. 332-346.

- Fidrmuc, J., 2005, 'Trade Structure during Accession to the EU', *Post-Communist Economies*, 17, 2, pp. 225-234.
- Fontagné, L. and Freudenberg, M., 1997, 'Intra-industry trade: methodological issues reconsidered', CEPII Working Paper, No. 97-01, January, Paris: CEPII.
- Gabrisch, H., 2006, 'Vertical intra-industry trade between EU and Accession Countries', IHW Discussion Paper, No. 12, July, Halle: Institut für Wirtschaftsforschung.
- Greenaway, D., Hine, R., Milner, C.R. and Elliott, R.J.R., 1994, 'Adjustment and the measurement of marginal intra-industry trade', *Weltwirtschaftliches Archiv*, 130, 2, pp. 418-427.
- Greenaway, D. and Milner, C., 1983, 'On the measurement of intra-industry trade', *Economic Journal*, 93, 372, pp. 900-908.
- Greenaway, D. and Milner, C., 1986, *The Economics of Intra-Industry Trade*, Basil Blackwell, Oxford.
- Grubel, H.G. and Lloyd, P.J., 1975, *Intra-Industry Trade*, John Wiley, London.
- Gullstrand, J., 2002, 'Demand patterns and vertical intra-industry trade with special reference to North-South Trade', *Journal of International Trade and Development*, 11, 4, pp. 429-455.
- Hamilton, C. and Kniest, P., 1991, 'Trade liberalisation, structural adjustment and intra-industry trade: a note', *Weltwirtschaftliches Archiv*, 127, 2, pp. 356-367.
- Helpman, E., 1981, 'International Trade in the Presence of Product Differentiation, Economies of Scale and Monopolistic Competition: A Chamberlin–Heckscher–Ohlin Approach', *Journal of International Economics*, 11, 3, pp. 305-340.
- Helpman, E. and Krugman, P.R., 1985, *Market Structure and Foreign Trade: Increasing Returns, Imperfect Competition, and the International Economy*, MIT Press, Cambridge MA.
- Hidalgo, C.A., Klinger, B., Barabási, A.L. and Hausmann, R., 2007, 'The Product Space Conditions the Development of Nations', *Science*, 317, 5837, pp. 482-487.
- Hoekman, B. and Djankov, S., 1996, 'Intra-industry trade, foreign direct investment, and the reorientation of Eastern European exports', Policy Research Working Paper Series, No. 1652, September, Washington: The World Bank.
- Janda, K. and Münich, D., 2004, 'The Intra-Industry Trade of the Czech Republic in the Economic Transition', *Emerging Markets Finance and Trade*, 40, 2, pp. 27-50.
- Jensen, L. and Lüthje, T., 2009, 'Driving Forces of Vertical Intra-Industry Trade in Europe 1996-2005', *Weltwirtschaftliches Archiv*, 145, 3, pp. 469-488.
- Kaminski B. and de la Rocha, M., 2003, 'Stabilization and association process in the Balkans: integration options and their assessment', World Bank Policy Research Working Paper, No. 3108, August, Washington: The World Bank.
- Kandogan, Y., 2003, 'Intra-industry Trade of Transition Countries: Trends and Determinants', William Davidson Working Paper, No 566, May, Ann Arbor: William Davidson Institute.
- Krugman, P.R., 1979, 'Increasing returns, monopolistic competition, and international trade', *Journal of International Economics*, 9, 4, pp. 469-479.

- Lancaster, K., 1980, 'Intra-Industry Trade under Perfect Monopolistic Competition', *Journal of International Economics*, 10, 2, pp. 151-175.
- Mardas, D. and Nikas, C., 2008, 'Economic Integration and Intra-industry Trade Between the European Community and the Western Balkan Countries', *Transition Studies Review*, 15, 3, pp. 511-523.
- Markusen, J.R. and Venables, A.J., 2000, 'The theory of endowment, intra-industry and multinational trade', *Journal of International Economics*, 52, 2, pp. 209-234.
- Rasciute, S. and Pentecost, E.J., 2010, 'A Nested logit approach to modelling the location of foreign direct investment in the Central and Eastern European Countries', *Economic Modelling*, 27, 1, pp. 32-39.
- Sawyer, W.C., Sprinkle, R.L. and Tochkov, K., 2010, 'Patterns and Determinants of Intra-Industry Trade in Asia', *Journal of Asian Economics*, 21, 5, pp. 485-493.
- Sklias, P., 2011, 'The political economy of regional integration in the Western Balkans'. *International Journal of Economic Sciences and Applied Research*, 4, 3, pp. 21-37.
- Stiglitz, J., 1987, 'The Causes and the Consequences of the Dependence of Quality on Price', *Journal of Economic Literature*, 25, 1, pp. 1-48.
- Vernon, R., 1966, 'International Investment and International Trade in the Product Cycle', *Quarterly Journal of Economics*, 80, 2, pp. 190-207.
- Zhang, J., van Witteloostuijn, A. and Zhou, C., 2005, 'Chinese Bilateral Intra-Industry Trade: A Panel Data Study for 50 Countries in the 1992-2001 Period', *Weltwirtschaftliches Archiv*, 141, 3, pp. 510-540.



**Appendix**

**Table A1: Data sources**

<b>Variable</b>	<b>Source</b>
Cost to export (US\$ per container); Cost to import (US\$ per container); Time to export (days); Time to import (days); GDP per capita, PPP (constant 2005 international \$); Gross fixed capital formation (% of GDP); Labor participation rate, total (% of total population ages 15+); Employment to population ratio, 15+, total (%)	World Development Indicators database
IIT, VIIT, HIIT (author's calculations based on...)	COMEXT database
Distance between capital cities in km	<a href="http://www.geobytes.com/citydistance.htm">http://www.geobytes.com/citydistance.htm</a>