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ANALYSIS OF INTRA-INDUSTRY TRADE BETWEEN BOSNIA AND HERZEGOVINA AND THE WESTERN BALKANS

Snježana Brkić *

ABSTRACT

The paper deals with the issue of intra-industry trade on the example of the trade between Bosnia and Herzegovina and the Western Balkans. The aim of the research is to present the characteristics of Bosnia and Herzegovina trade with the region in the 2004-2011 period, in the context of distinguishing inter- from intra-industry trade. Differentiating between the two types of foreign trade and identifying the structure of intra-industry trade contribute to the identification of a country's trade pattern, and thus to the insight into the level of the country's and its individual industries' competitive ability. The key questions that provided directions for the research include: is the trade between Bosnia and Herzegovina and the region of prevalently inter- or intra-industry character, which type of intra-industry trade prevails in terms of product differentiation (vertical or horizontal), and what is the trend of intra-industry trade intensity in the observed period. The responses deriving from the analysis results reveal the existence of congruence between the pattern of Bosnia and Herzegovina trade with the region and the pattern of the overall Bosnia and Herzegovina trade with the world, which is reflected in the increasing intensity of intra-industry trade, with the still prevailing share of inter-industry trade, dominance of the vertical type of intra-industry trade, and the greatest intensity of intra-industry trade in traditional industries and industries of lower technological level. The results of the research indicate the insufficient convergence of Bosnia and

Herzegovina economy with the region's economies, and still unfavorable position compared to partners.

Key words: intra-industry trade (IIT), Bosnia and Herzegovina (BiH), the Western Balkans (WB)

JEL classification: F14

1. INTRODUCTION

Contrary to the long-ingrained view on the structure of international trade flows, originating from traditional understanding of international trade, numerous studies proved that a significant and increasing part of contemporary trade between countries is of intra-industry character. Unlike the inter-industry trade, which includes exchange of different industries' products, intra-industry trade (IIT) is the exchange of products closely related in supply or demand, due to which they belong to the same industry. Explanation of the emergence of this phenomenon can be found in various factors – geographic, temporal, product and/or market-related ones.

Owing to the continuous increase of share in world trade, its complexity and contradictory nature, which kept generating new debates, and the absence of a general theory that would be applicable to different circumstances in which this phenomenon appears, intra-industry trade has become a subject of interest to a number of theoreticians and researchers over the last four decades.

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Theoretical considerations of intra-industry trade resulted in the insight that the overall theoretical basis of intra-industry trade is built by a series of approaches and models, from Smith to Porter, with the main theoretical foundation being found in more recent theories of international trade, particularly in models that start from monopolistic competition, economy of scale, and horizontal production differentiation. In the meantime, theoretical modeling has been supplemented with numerous empirical studies, spurred by the pioneer 1975 paper by Grubel and Lloyd on measuring IIT. A particularly significant contribution to the studies into intra-industry trade was provided by Greenaway, Hine, Milner, Balassa, Bauwens, Bergstrand, Brühlhart, etc.¹

Questions that engrossed IIT researchers over the past period mainly refer to two areas: measuring IIT intensity and determining its prevailing type (To what degree does IIT participate in international trade of individual countries, groups of countries or integrations, and which IIT type prevails?) and analysis of IIT determinants (Which factors affect IIT and its components, and what is the nature of the impact?)

The paper belongs to the category of studies which primarily measure the intensity of a country's IIT (more accurately, in Bosnia and Herzegovina) with a group of countries, at the aggregate level and by industries, over a longer time period.

2. OVERVIEW OF RELEVANT RESEARCH

Numerous empirical studies into IIT over the past three decades, starting from the already "cult" research by B. Balassa of 1966, mainly deal with the analysis of trade flows in the developed market economies, particularly those of the Western European countries. Research into the intra-industry specialization and trade in medium developed countries, particularly in advanced transition economies

of Central and East Europe, were intensified in the early 1990s. In this respect, same as in many others, the Southeast Europe region lags behind significantly – research into IIT in transition countries of the region started as late as about fifteen years ago, typically within broader studies of trade, competitive advantages or trade liberalization of these countries, and are still fairly modest. The reason why empirical IIT analyses in this area are few is not a lack of needs or interest in this research, but rather a lack of adequate – reliable and comparable data in a longer continuous time series, and the demanding and extensive nature of such analyses, which typically include samples with a few countries and a few industries (Brkić 2012a, pp. 187.)

One of the first studies that covered intra-industry trade in the region to a significant extent is the study of trade in manufacturing industry between Southeast Europe and the European Union, conducted by V. Astrov (2001). Eight years later, IIT research within a World Bank's study on regional trade integration in the region (Handijski 2009), although it does not allow direct comparison of the results since it was conducted using different classifications and levels of data aggregation, confirms earlier research findings on the presence of extremely low share of intra-industry trade in all Western Balkans countries, both in the intra-regional trade and in the trade with the European Union. On two occasions, Mardas and Nikas (2008) examined the correlation between trade liberalization, economic integration and IIT intensity on the example of the Western and Eastern Balkans countries; once in the exchange with the European Union over the period 1995-2006, and again in these countries' exchange with Greece in the period 1993-2006. Studies into the IIT of the individual Western Balkans countries over the past few years have been most numerous on the example of Croatia: Škuflić and Vlahinić-Dizdarević (2004); Škuflić (2005); Škuflić et al (2005); Buturac (2006),

Derado (2007). Intra-industry trade of FR Yugoslavia, i.e. Serbia was analyzed in more detail in comparatively “old” papers by B. Pelević on FR Yugoslavia intra-industry trade of 1997 and 1999 and, in outlines, within a study into Serbia’s comparative advantages 2002 (Jovičić ed. 2002). The results point to the domination of inter-industry trade, particularly in the relations with the European Union and countries of the original CEFTA, while the intra-industry trade was somewhat more prominent in the trade with the Balkan countries. In the observed years (1998 and 2001), a declining trend of IIT intensity was observed compared to the early 1990s, both in the overall FR Yugoslavia trade and in its trade with the listed group of countries. Intra-industry trade of Bosnia and Herzegovina was first analyzed incidentally and only in outlines in a few papers, whose primary aim was research into the Southeast Europe trade in the context of regional integration and/or accession to the European Union (Astrov 2001; Mardas and Nikas 2008; Handijski 2009). The first IIT study focused exclusively on Bosnia and Herzegovina is found in Domazet’s paper of 2009, in the form of comparative analysis of BiH IIT in 2002 and 2007. The research included measuring the IIT intensity by countries and product groups, and measuring marginal IIT. The second study, with a broader significance by its geographic, sectoral and time scope (2003-2008) was published as part of the monograph on intra-industry trade by Brkić (2012).

3. METHODOLOGICAL EXPLANATIONS

3.1. Goal and Hypotheses

The paper is aimed at determining characteristics of foreign trade between Bosnia and Herzegovina (BiH) and the Western Balkan region (WB), viewed as a whole and by individual countries, in the context of distinguishing between inter- and intra-industry trade component. The research should result in responses to the following

questions: Is the trade between Bosnia and Herzegovina and the region of dominantly inter- or intra-industry character? What is the trend of intra-industry trade intensity in the observed period? Which type of intra-industry trade prevails in terms of production differentiation (vertical or horizontal)? and In which industries does the intra-industry trade prevail?

The research is focused on testing the following hypotheses:

- The inter-industry component prevails in the BiH intra-regional trade, both in its trade with the region as a whole and in the trade with the individual members of the region.
- Viewed at the aggregate level, the intensity of BiH intra-industry trade with the region as a whole and with individual countries was increasing over the given period.
- Viewed by sectors, the intra-industry trade intensity is the greatest in individual traditional labor-intensive and resource-intensive sectors, i.e. generally in the sectors of lower technological level, with the dominance of vertical IIT type.

3.2. Contents and Scope of the Research

Analysis of BiH intra-industry trade is preceded by a short review of the volume and trend of the country’s foreign trade with the region in the observed period. The bulk of research is focused on measuring the IIT intensity, and includes:

- measurement and comparison of the intensity of BiH IIT with the Western Balkans as a whole and with individual countries of the region, by years;
- measurement and comparison of the intensity of BiH IIT by product groups (industries), by years, with a special

review of the manufacturing industry, and determining IIT structure in terms of its classification into horizontal and vertical component.

Geographic scope: The research includes the region of the Western Balkans, as an area to which BiH gravitates, in geographic, political and economic terms. Besides BiH, the region consists of six countries - Albania, Montenegro, Croatia, Kosovo², Macedonia, and Serbia.

Time scope: The observed time period covers eight years - from 2004 to 2011. In the analysis of bilateral trade flows with Serbia, Montenegro and Kosovo, the period was divided into two parts - the first period (2004-2006) observes the flows of BiH trade with the state union of Serbia and Montenegro (SCG) including Kosovo, as a unique customs territory, while the second is focused on the flows with each of them separately (2007-2011)³.

Sectoral scope: Intra-industry trade was measured in industries that, in the overall BiH trade with the world and BiH trade with the Western Balkans, registered exports and/or imports over the observed period - in 64 (WB) to 66 industries (for the world), defined as SITC rev. 3 divisions (two-digit level) out of the 67 possible industries at this aggregation level.

3.3. Data Types and Sources

Analysis of the overall foreign trade and measurement of the share of BiH IIT with the Western Balkans used trade data of the Agency for Statistics of BiH, classified by countries and industries (SITC rev. 3), at the annual level, for the period 2004-2011. In order to identify the IIT type, unit values of exports and imports were calculated based on Agency for Statistics of BiH data on the values and quantities of exports and imports by years⁴.

3.4. Selected IIT Indices

Share of IIT by industries was measured using the standard uncorrected Grubel-Lloyd index (Grubel and Lloyd 1975), while share of IIT by countries was measured using the aggregate G-L index, in its uncorrected and corrected form.

$$B_i = \frac{(X_i + M_i) - |X_i - M_i|}{X_i + M_i}, 0 \leq B_i \leq 1$$

B_i - standard G-L index for the given industry "i" at the selected level, i.e. IIT share in the "i" industry trade between two countries;

X_i - exports of industry "i" from the given country to another country;

M_i - imports of industry "i" from the given country to another country;

$i = 1, \dots, n$ - the number of industries.

$$B_j = \frac{\sum_i (X_i + M_i) - \sum_i |X_i - M_i|}{\sum_i (X_i + M_i)}, 0 \leq B_j \leq 1$$

Index value 0 indicates the existence of purely inter-industry trade, while index value 1 means a total overlap of exports and imports, i.e. that the entire trade is of intra-industry type. In most cases, value of G-L index is between these two extreme values.

Since the analysis of geographic structure of the overall BiH foreign trade showed that there is a significant trade imbalance in the trade with most trade partners from the region, aggregate corrected (adjusted) G-L indices were calculated in the same time⁵.

$$C_j = \frac{\sum_i (X_i + M_i) - \sum_i |X_i - M_i|}{\sum_i (X_i + M_i) - \left| \sum_i X_i - \sum_i M_i \right|}$$

$$0 \leq C_j \leq 1$$

Industries where vertical or horizontal IIT respectively prevails were identified using the most frequently applied methodology in the

empirical literature on IIT, which was developed by Greenaway, Hine and Milner (1995). The methodology is based on the assumption that the relative gap between unit value of exports and unit value of imports reflects the difference in the quality of products that are exported and imported in the mutual trade between two countries.

$$RUV = \frac{UV^X}{UV^M}$$

$$HIIT : RUV \in [(1-\alpha), (1+\alpha)]$$

$$VIIT : RUV \in [(1+\alpha), +\infty] \quad \text{ili}$$

$$RUV \in [0, (1-\alpha)]$$

RUV – ratio between exports and imports unit value;

UV^X - unit value of exports; UV^M - unit value of imports;

HIIT – horizontal IIT; VIIT – vertical IIT;

α - arbitrarily fixed dispersion factor (± 0.15).

Horizontal IIT is defined as simultaneous exports and imports at a SITC division level, where unit values of exports and imports range in the interval from 0.85 to 1.15. Trade in products whose unit values are beyond this interval was identified as vertical IIT. Intra-industry trade is of vertical type in industries where unit value of exports is high compared to the unit value of imports, so that the ratio exceeds 1.15 (which means that quality of exports is higher than that of imports), as well as in industries where unit value of exports is low compared to the unit value of imports, so that the ratio is below 0.85 (which means that quality exports is lower than that of imports). Owing to this information, vertical IIT can be classified into the vertical IIT in higher-quality products and vertical IIT in lower-quality products.

The values of individual IIT indicators were calculated, presented and interpreted either

for each year of the period and/or as the average for the entire observed period or the selected years within the period.

4. RESEARCH RESULTS

4.1. Brief Review of BiH Foreign Trade with the Region

BiH foreign trade mostly proceeds with the Western Balkans and the European Union since, on average, around 90% of its exports and around 76% of its imports in the observed period pertained to these two groups of countries. (Tables 1 and 2 in section 7 “Appendices”) These are geographically close markets where BiH products enjoy a preferential treatment⁶.

The Western Balkans’ share in BiH exports amounted to an average of about 36%, and its share in its imports to around 28% in the period 2004-2011. The share of this group of countries in BiH exports in this period varied in the interval from 33% to 38%, while their share in imports ranged from 25 to 30%. The region’s market is evidently more significant for BiH exports than for its imports, contrary to some estimates of the effects of trade liberalization in the region on BiH trade balance. (Tables 1 and 2 in section 7 “Appendices”)

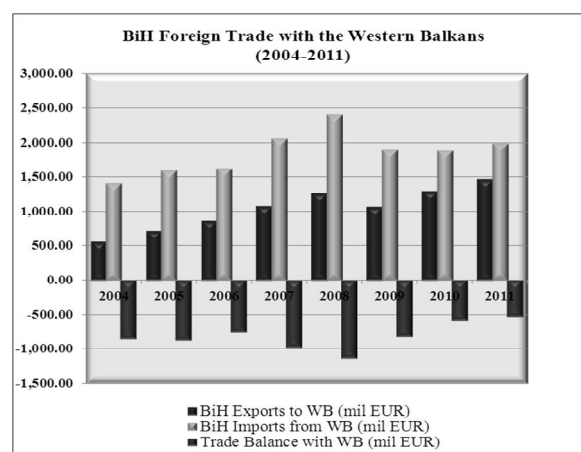


Figure 4.1. BiH Foreign Trade with the Western Balkans⁷

The top five greatest BiH foreign-trade partners include two countries in the region: Croatia and Serbia. Besides Germany, Croatia has been the most significant BiH export market over the past few years (the average share of exports to Croatia in the overall BiH exports amounts to about 16%), and the country with the largest share in BiH imports (cca 15% on average). Serbia is the third most significant BiH trade partner with the average share in BiH exports of around 13% and the share in BiH imports of around 11%. Montenegro is among the seven largest BiH export destinations, with cca 4% share in BiH exports. Foreign trade with Albania and Kosovo is of negligible proportions.⁸

Over the observed period, BiH was continuously registering a significant trade deficit in its trade with the region as a whole, and with the three countries in the region (Croatia, Serbia, i.e. former SCG and Macedonia)⁹. However, trade deficit was indubitably decreasing and, for instance, it was approximately by one third lower in 2011 than in 2004, i.e. exports coverage with imports almost doubled (from the 40.0% level in the beginning of the period to the level of 73.6% at the end). (Table 3 in section 7 “Appendices”)

Since the region's shares in BiH export-import flows exceed a third of its overall trade, and since two countries of the region are among the top five BiH foreign-trade partners, there is evidently a respectable intra-regional focus of foreign trade. However, it is a fact that the importance of the region for BiH trade is about to decrease significantly, with the announced Croatia entry into the European Union in mid-2013.

4.2. BiH Intra-Industry Trade at the Multilateral Level

Measured in total, by all industries, BiH IIT share reached the average level of 0.43, indicating the prevalence of inter-industry

component in BiH trade with the world. However, although the share of IIT in the overall BiH trade is relatively low, it shows an increasing trend over the greater part of the observed period. Compared to 2004, when IIT index amounted to the level of 0.33, in 2011 the index reached a considerably higher level of 0.49. (Table 3 in section 7 “Appendices”) The measured intensity of BiH IIT is still at a considerably lower level than it was registered in more developed transition countries in the late 1990s – these countries exceeded the described level as early as some ten years ago (Brkić, 2012a).

Share of IIT is greater in the manufacturing industry (0.49 on average) than in the overall trade in all sectors, which is consistent to the theoretical assumption and finding of studies in IIT trends. Permanent growth of IIT indices in the manufacturing industry brought IIT, in 2011, to the level of 0.55 – with 16 percentage points higher compared to 2004. (Table 3 in section 7 “Appendices”) However, more important is the fact that there was an about-turn in the trading pattern in the manufacturing industry, since the index exceeded the demarcation threshold and entered the zone of, though weak but still prevailing, intra-industry trade.

The following figure illustrates the trend in IIT intensity in all BiH industries in total and in the manufacturing industry. It is obvious that both values move totally in parallel - first a slight growth in IIT by an almost identical rate, then a sharp increase in 2006 by 8 and 10 percentage points respectively, stagnation in the period 2007-2009 (which can be ascribed to the effect of the global recession on BiH trade flows), and gradual increase since 2010.

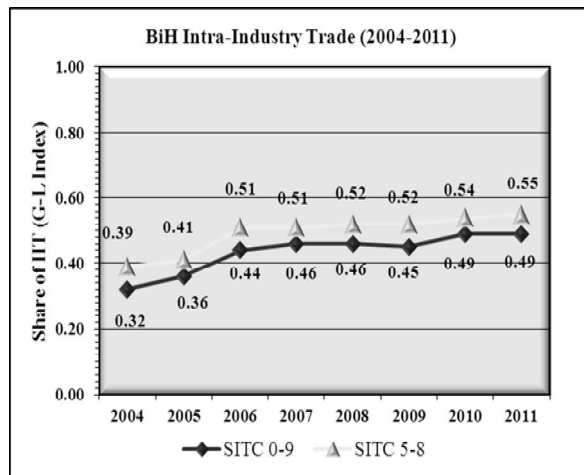


Figure 4.2. BiH Intra-Industry Trade with the World (2004-2011)¹⁰

Analysis by sectors supports the thesis on the prevalence of inter-industry trade, as well as the thesis on the growing intensity of intra-industry trade. Actually, in a larger number of product groups the inter-industry trade prevails, both in the beginning and in the end of the observed period. In 2004, the number of product groups with the prevailing inter-industry trade amounted to as much as 53 (out of the total of 66 where foreign trade was registered), in order to decline gradually over the following few years to the level of 42 in 2008. In the following period, up to 2011, the number of product groups with the prevailing inter-industry trade ranged in the interval 42-44. Over the entire period, the greatest number of product groups is found in the category with the lowest G-L indices (0.25), though this number decreased from one year to another, decreasing from the level 40 in 2004 to the level 28 in 2011.¹¹

Viewed at the level of SITC section, the highest G-L indices, which point to prominent prevalence of intra-industry trade were observed in a few industries in section 6 – Manufactured goods, classified chiefly by material and 8 – Miscellaneous manufactured articles, and 7 – Machinery and transport equipment. The lowest indices are mainly found in sections 0 – Food and live animals, 1

– Beverages and tobacco, and 5 – Chemicals and related products.

From the viewpoint of the BiH IIT composition, the prevalence of vertical IIT (with the exports of low-quality products) compared to horizontal IIT is evident. In 2004, horizontal IIT was registered only in 8 product groups (out of 66), in 2008 – only in 10 product groups (out of 66), and in 2011 in 11 product groups (out of 64).¹²

4.3. BiH Intra-Industry Trade with the Western Balkans

The average intensity of BiH intra-industry trade with the Western Balkans over the observed period (0.44) is almost identical to the average intensity of the overall BiH intra-industry trade (0.43). The trend of the intensity shows very small differences between the years, which is surprising due to the fact that in the first case it is the trade with a group of countries which share a number of common characteristics with BiH, while in the second case it is the overall trade with the world, i.e. with a numerous group of countries very much different from BiH. (Figure 4.3)

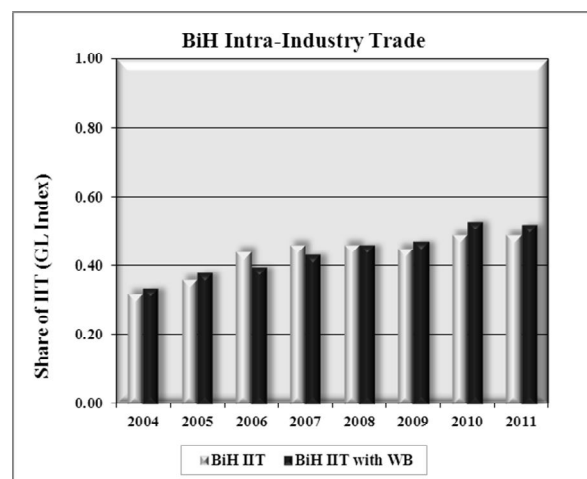


Figure 4.3. BiH Intra-Industry Trade with the World and with the Western Balkans¹³

Over the last two years of the observed period, trade with the Western Balkans entered the area of prevailing, though fairly weak, intra-industry trade (0.53 and 0.52 respectively).

However, in the most part of the observed period the inter-industry trade prevails.

If we view only the trade in manufacturing industry (SITC sections from 5 to 8) with the Western Balkans, quite expectedly, in accordance with theoretical assumptions and previous studies, we find higher IIT indices. As early as in 2005, IIT index revealed prevalence of intra-industry trade (0.55), in order to achieve the highest value in the observed period, that of 0.63, in 2008. Growth of IIT intensity in the manufacturing industry points to the conclusion about the increase in convergence between BiH and the region in terms of industrial development. (Figure 4.4)

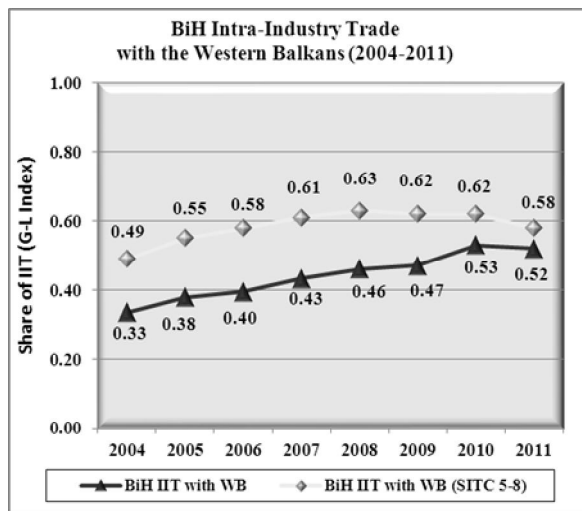


Figure 4.4. BiH Intra-Industry Trade with the Western Balkans¹⁴

The difference in IIT intensity, compared to the overall BiH trade, is more noticeable in the manufacturing industry, where the average IIT intensity with the WB (0.59) to a larger extent exceeded the IIT average for the BiH manufacturing industry as a whole (0.49). (Table 4 in section 7 "Appendices")

4.3.1. Intra-Industrial Trade with the Region by Countries

Viewed by countries of the region, there are significant differences in IIT trends. In the period 2007-2011, the average intensity of BiH IIT with Albania (0.02) is almost twenty

times lower compared to the average intensity of BiH IIT with Croatia, Serbia and Macedonia. A low IIT intensity was also registered in the exchange with Kosovo – almost ten times lower average intensity compared to the three listed countries, and with Montenegro – more than twice lower intensity.

Table 4.1. BiH Intra-Industry Trade with the Western Balkan Countries

Country	Share of IIT (Aggregate G-L Index)					Average
	2007	2008	2009	2010	2011	
Albania	0.01	0.01	0.04	0.01	0.01	0.02
Montenegro	0.16	0.18	0.17	0.16	0.15	0.16
Croatia	0.31	0.33	0.37	0.45	0.40	0.37
Kosovo	0.09	0.06	0.02	0.02	0.02	0.04
Macedonia	0.24	0.36	0.37	0.38	0.42	0.35
Serbia	0.41	0.40	0.41	0.39	0.37	0.40

Source: Author's calculation based on data by Agency for Statistics of BiH.

The highest average intensity of BiH IIT over the latest five-year period was registered in trade with Serbia (0.40)¹⁵ It is followed by Croatia with 0.37, and Macedonia with 0.35.¹⁶ The lowest average shares were registered in trade with Albania (0.02) and Kosovo (0.04). The highest index value in the observed period was registered in the trade with Croatia in 2010, and amounted to 0.45. (Table 4.1)

Indices that registered a continuous growth throughout the period were observed only with Croatia (except in 2011) and Macedonia. Indices that stagnated throughout the period or, in some countries, slightly decreased are IIT indices with Albania, Montenegro, Kosovo and Serbia. Over the past few years, trade with Albania and Kosovo is almost entirely of inter-industry character; in the figure, the curve coincides with the X-axis. (Figure 4.5)

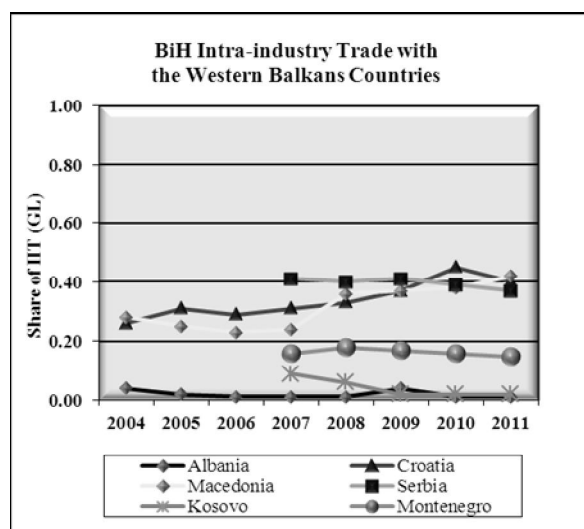


Figure 4.5. BiH Intra-Industry Trade with the Western Balkan Countries¹⁷

The share of intra-industry trade by countries was measured first with aggregate uncorrected G-L index. However, BiH foreign trade in general, as well as with individual countries of the region separately, is characterized by a significant trade imbalance. The existence of imbalance has a negative effect on G-L index, making the IIT share lower than it actually is.¹⁸

A test conducted using the G-L index corrected by trade imbalance revealed 15-25 percentage points higher IIT shares in trade with Croatia, Macedonia and Serbia which, except in 2011, entered the area of prevailing (though less intensive) intra-industry trade. However, in countries with which exchange is extremely imbalanced, IIT indices after correction were 3-4 times higher (Montenegro) and 10-15 times higher (Kosovo). (Table 5 in section 7 "Appendices")

These results are typically not taken as quite accurate, due to certain shortcomings of using the adjusted G-L index. What is indubitable is the fact that due to the trade imbalance in BiH trade with these countries the share of IIT is to a certain extent underestimated.

4.3.2. Intra-Industry Trade with the Region by Industries

Analysis of IIT with the Western Balkans by industries (SITC divisions) provides additional information on the production structure of BiH and the country's competitive position.

Analysis of sectoral distribution revealed that the number of product groups where intra-industry trade emerged increased ($GL \neq 0$). The number of product groups where trade pattern is of dominantly intra-industry character ($GL > 0.50$), after a relative stagnation over the past few years, also increased in 2011.

Table 4.2. Number of Product Groups by the Value of G-L Index

Rank GL_i	Number of Product Groups							
	2004	2005	2006	2007	2008	2009	2010	2011
0.00 - 0.25	25	27	26	25	24	17	17	20
0.26 - 0.50	17	15	13	15	13	21	20	12
0.51 - 0.75	9	9	13	11	12	15	16	22
0.76 - 1.00	13	13	13	13	15	11	11	10

Source: Author's calculation based on data by Agency for Statistics of BiH.

In 2004, in the trade between BiH and the rest of the Western Balkans as a whole, inter-industry trade prevailed in 42 product groups (which make up 65% of the total number of groups). Thus, nine years ago only 22 groups (somewhat over a third of the total number of groups) had characteristics of prevalently intra-industry trade ($GL > 0.50$); out of this number, 13 had characteristics of stronger IIT and 9 those of weaker, though still prevalent IIT. In 2008, the number of groups which registered prevalence of IIT increased to 27 (out of a total of 64), and in 2011 to 32 (out of a total of 64), thus, to the half of the total number. (Table 4.2)

Unlike at the beginning of the observed period, when the category with the lowest G-L indices ($GL \leq 0.25$), i.e. the category of strongest inter-industry trade included 25 groups, the

number started declining, from 2008, to 24 (2008), then to 17 (2009, 2010), in order to increase to 20 in 2011. The number of groups in the category of prevalent but weaker inter-industry trade ($0.25 \leq GL \leq 50$) was relatively stable over a few years – in the period 2004-2008 it amounted between 13 and 17, then grew to 20-21 (2009, 2010), in order to fall to 12 in 2011. In the same time, the number of groups which registered a medium intensity of prevalent IIT, from 9 at the start of the period, through 15 in the middle of the period (2008) significantly increased to the level of 22 at the end of the period. The number of groups in the highest index category ($GL > 0.75$) stagnated over the last three years at the level of 11 and 10 respectively. It is obvious that a shift occurred towards the increase in product groups with prevalent IIT, although it is not yet as big as would be expected due to the achieved progress in transition, industrial production, and trade liberalization with the region. (Table 4.2)

The “Top 15 G-L indices” lists of 2004, 2008 and 2011 are identical in five points (divisions 03 – Fish and preparations thereof, 63 – Cork and wood manufactures, 64 – Paper, paperboard and articles of paper pulp, 69 – Manufactures of metals, n.e.s., 82 – Furniture and parts thereof), and if we compare only 2008 and 2011, we find identity in 8 points (besides the listed divisions, they include divisions 02 – Dairy products and eggs, 05 – Vegetables and fruit, and 84 – Wearing apparel). In 2004, the highest G-L index was registered in group 52 – Inorganic chemicals (1.00); in 2008, in group 63 – Cork and wood manufactures (0.99); and in 2011, in group 42 – Fixed vegetable fats and oils (1.00). In all the three years, the top 15 included 4 product groups from manufacturing section 6 – Manufactured goods, classified chiefly by material. Interestingly, unlike 2004 and 2008, when top 15 groups with the highest IIT indices included 5 and 3 groups, respectively, from section 7 – Machinery and transport

equipment, in 2011 only one group from this section is in the top list, while 4 groups from section 0 – Food and live animals registered very high IIT indices. IIT shares of agricultural products both grew and reached considerable values of $GL > 0.50$, which reflect the prevalence of intra-industry trade in 5¹⁹ out of the 10 product groups in this section. (Table 4.3)

Table 4.3. Product Groups with Higher G-L index in the Trade with the Western Balkans

2004			2008			2011		
SITC	GL _i	UV ^x /UV ^m	SITC	GL _i	UV ^x /UV ^m	SITC	GL _i	UV ^x /UV ^m
52	1.00	0.68Vn	63	0.99	2.11 Vv	42	1.00	1.14 H
73	0.98	0.58Vn	06	0.98	0.20 Vn	05	0.99	1.59 Vv
78	0.95	0.73Vn	64	0.98	0.71 Vn	03	0.97	1.12 H
82	0.95	0.85H	79	0.98	1.10 H	64	0.96	0.84 Vn
79	0.93	3.04Vv	03	0.93	1.00 H	69	0.91	0.40 Vn
99	0.89	0.92H	69	0.92	0.25 Vv	02	0.89	0.61 Vn
63	0.88	1.30Vv	42	0.91	1.05 H	63	0.88	1.96 Vv
69	0.87	0.40Vn	78	0.88	1.25 Vv	82	0.83	0.98 H
03	0.85	0.88H	25	0.86	1.07 H	27	0.77	0.23 Vn
64	0.85	0.39Vn	82	0.86	0.96 H	61	0.76	0.53 Vn
61	0.79	1.36Vv	05	0.83	2.34 Vv	89	0.74	0.95 H
74	0.78	0.59Vn	67	0.78	0.85 H	74	0.73	0.81 Vn
23	0.77	5.27Vv	02	0.77	0.59 Vn	84	0.72	0.45 Vn
26	0.74	0.39Vn	84	0.77	0.76 Vn	01	0.70	0.81 Vn
71	0.68	0.57Vn	73	0.76	0.36 Vn	33	0.66	0.88 H

Source: Author’s calculation based on data by Agency for Statistics of BiH.

Legend: SITC – division of Standard International Trade Classification; GL_i - Grubel-Lloyd IIT index; UV^x/UV^m - ratio between export and import unit values; H – horizontal IIT; Vv – vertical IIT in higher-quality products; Vn – vertical IIT in lower-quality products.

Viewed at the level of SITC sections in 2011, G-L indices which point to the prevalence of intra-industry trade were observed in sections 6 – Manufactured goods, classified chiefly by material, 8 – Miscellaneous manufactured articles, 7 – Machinery and transport equipment and 0 – Food and live animals. Prevalence of inter-industry trade was observed mostly in sections 1 – Beverages and tobacco, 2 - Crude materials, inedible, except

fuels, 3 - Mineral fuels, lubricants and related materials, 4 - Animal and vegetable oils, fats and waxes and 5 - Chemicals and related products, n.e.s. Thus, intra-industry trade is significantly represented in traditional, relatively declining (labor-intensive and resource-based) industries within section 6²⁰, in labor-intensive and a couple of technology-intensive industries of section 8, in few expanding, knowledge-based activities of section 7, and in agricultural products.

However, most groups from the top list by G-L indices had relatively low respective shares in the BiH intra-regional foreign trade. In 2011, the category of highest G-L indices included 10 product groups whose cumulative share in BiH foreign trade with the region amounted only to about 16%. However, if we view the exchange in 10 product groups which achieved the largest individual shares in BiH trade in 2011, intra-industry trade (prevalence in 6 groups) exceeded the inter-industry one (prevalence in 4 groups). In 5 out of 6 groups with the prevailing IIT and significant trade shares, the vertical-type IIT was registered.²¹

Throughout the observed period, vertical-type IIT prevails over the horizontal type, with exports of primarily lower-quality products from BiH. In 2008, for instance, horizontal IIT appeared only in 10 product groups. The total share of the listed groups in BiH intra-regional trade amounted to cca 31%. In 2011, horizontal IIT was registered in 13 divisions with the total share in BiH intra-regional trade of cca 24%, and vertical in 51 groups (36 groups with higher-quality products and 15 groups with lower-quality products).²² Thus, the share of vertical IIT, with respect to the number of product groups where it prevails and the level of their share in BiH trade with the region, significantly exceeded the share of horizontal IIT.

5. CONCLUDING CONSIDERATIONS

Comparative analysis of the patterns of BiH trade with the region in the context of distinguishing between inter- and intra-industry component and the pattern of BiH trade with the world revealed their significant congruence in main characteristics.

Without any doubt, BiH exchange with the Western Balkans, as well as BiH overall exchange with the world, still finds its theoretical explanation in traditional international trade theories, based on comparative advantages, rather than in modern trade models. This statement derives from the fact that research mostly identified BiH intra-regional trade as inter-industry more than intra-industry trade, with the increasing but generally low intensity, coupled with prevalently vertical-type IIT.

The hypothesis on the prevailing inter-industry trade was confirmed, with certain limitations, in the analysis of aggregate BiH IIT with the region as a whole (on average, and for larger part of the observed period), in the analysis by countries of the region and in the analysis by industries. Prevalence of IIT, although of lower intensity, occurs only if research is limited only to the manufacturing industry (SITC 5-8). The second limitation pertains to the selection of measures for IIT intensity in the context of existence of trade imbalance. Use of the corrected G-L indices, in the trade with more significant partners from the region, reveals the prevailing intra-industry trade. However, it should be noted that there is still a series of controversies regarding the correction for trade imbalance, primarily due to the inapplicability at the sectoral level and questionable accuracy.

Still, it is evident that intra-industry trade with the region is gradually increasing every year, though mainly owing to the growth in intensity of IIT with Croatia and Macedonia, while IIT with other regional partners has

mostly been stagnating over the past couple of years. The intensity of BiH intra-industry trade with countries of the region, viewed individually, is generally at a low level, which is surprising, due to the empirically several times confirmed thesis on the existence of stronger intensity of IIT between geographically close and similar countries that belong to the same economic integration.

Analysis of intra-industry trade by industries revealed the greatest IIT intensity primarily in the industries of lower technological level, such as traditional, labor-intensive and resource-based industries, and in some agricultural products. Besides, in most industries where IIT occurs, prevalence of its vertical type was identified, and it was observed mainly in the lower-quality products.

If we understand IIT intensity as an indicator of an economy's competitiveness and its convergence with other countries' economies, then the research results inevitably point to the conclusion on the unsatisfactory competitiveness of BiH economy and insufficient convergence with regional partners' economies. Since these are partners that, together with BiH, belong to the same regional economic integration – CEFTA2006, the existence of insufficient convergence inevitably raises the question for BiH of the estimate of adjustment costs due to trade liberalization. In this context, it seems advisable to expand research by measuring marginal IIT between BiH and the region, as a dynamic category that can reveal the pattern of changes in trade and specialization and allow the estimate of adjustment costs.

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- ² Exclusively for the needs of this research, Kosovo was treated as a separate customs territory regardless of the present state and political status, and therefore trade between BiH and Kosovo was shown separately.
- ³ The reason for covering the shorter period is the fact that it is only after the separation of the former state union of SR Yugoslavia, i.e. Serbia and Montenegro in 2007 that one can separately observe BiH foreign trade with the two countries and with Kosovo as a separate customs territory. However, it should be noted that, since the moment of separation, BiH trade statistics up until now recorded a certain number of transactions every year that were a backlog from the previous period and that could not be allocated to the newly created states. The un-allocated values are not high, and have a rapid decrease tendency.
- ⁴ Unit value of exports from BiH was calculated based on the export value at f.o.b. parity and expressed in EUR per kilogram. Unit value of imports to BiH was calculated based on import value at c.i.f. parity and is expressed in EUR per kilogram. In accordance with EU principles and standards, quantities of all products are expressed in net mass (weight without packaging) measured in kilograms, except for electrical energy, which is expressed in 1000kwh.
- ⁵ Trade imbalance leads to underestimates of IIT level. The bigger trade imbalance, the lower standard G-L index, i.e. the greater difference between the standard and adjusted G-L index. If the trade imbalance is negligible, adjustment is minimal and does not have a significant impact

on measurement results, while adjustment in case of large imbalance can lead to completely unrealistic changes in the results.

- ⁶ Total trade liberalization in the region was achieved upon signing the CEFTA2006 agreement, while trade liberalization with the European Union is regulated by the Stabilization and Association Agreement, signed between BiH and the EU on June 16th, 2008.
- ⁷ Author's calculation based on data by Agency for Statistics of BiH. See Table 3 in section "Appendices".
- ⁸ Author's calculation based on data by Agency for Statistics of BiH.
- ⁹ Over the 2004-2007 period, BiH had trade deficits with almost all the countries in the region (four countries at the time), except with Albania. Trade deficits with Croatia and Macedonia kept increasing, while trade deficit with Serbia and Montenegro started decreasing. In the 2007-2011 period, BiH trade balance still showed deficits with Croatia, Serbia and Macedonia, and surpluses in trade with Albania, Montenegro and Kosovo.
- ¹⁰ Author's calculation based on data by Agency for Statistics of BiH.
- ¹¹ Author's calculation based on data by Agency for Statistics of BiH.
- ¹² Author's calculation based on data by Agency for Statistics of BiH.
- ¹³ Author's calculation based on data by Agency for Statistics of BiH. See Table 4 in section "Appendices".
- ¹⁴ Author's calculation based on data by Agency for Statistics of BiH.
- ¹⁵ Serbia is ranked second by the average intra-industry trade intensity among the most significant BiH trade partners. BiH has the largest intra-industry trade with Slovenia, both viewed by years and as the average for the entire period (0.44). It is followed by Serbia, Italy, Croatia and Germany. See Table 8 in section "Appendices".
- ¹⁶ Over the eight-year period, the average intensity of BiH IIT with Croatia amounted to 0.34 and with Macedonia to 0.32.
- ¹⁷ Author's calculation based on data by Agency for Statistics of BiH. See Table 6 in section "Appendices".
- ¹⁸ The negative correlation between trade imbalance and IIT intensity was proven in a number of studies, for instance in papers by Greenaway and Milner (1981), Lee and Lee (1993), Matthews (1998), Clark and Stanley (2003), Lee and Sohn (2005), etc.
- ¹⁹ These are groups 01 – Meat and meat preparations, 02 – Dairy products and eggs, 03 – Fish and preparations thereof, 05 – Vegetables and fruit, 06 – Sugar, sugar preparations and honey.
- ²⁰ These are products of leather and hide industry, wood industry, paper and paper pulp industry, textile industry, iron and steel industry, non-ferrous metallurgy.
- ²¹ Author's calculation based on data by Agency for Statistics of BiH.
- ²² Author's calculation based on data by Agency for Statistics of BiH.

7. APPENDICES

Table 1. Share of the Western Balkans and the European Union in BiH Exports (2004-2011)

Country Group	Share of BiH Exports (%)								
	2004	2005	2006	2007	2008	2009	2010	2011	Average
Western Balkans (WB)	36.23	37.19	32.89	35.79	37.09	38.01	35.86	34.92	36.00
European Union (EU)*	55.57	53.34	57.65	57.29	55.18	54.25	54.54	55.78	53.71
Total	91.80	90.53	90.54	93.08	92.27	92.26	90.40	90.70	89.71

Source: Author's calculation based on data by Agency for Statistics of BiH.

* 2004-2006 EU-25; 2007-2011 EU-27

Table 2. Share of the Western Balkans and the European Union in BiH Imports (2004-2011)

Grupacija	Share of BiH Imports (%)								Average
	2004	2005	2006	2007	2008	2009	2010	2011	
Western Balkans (WB)	29.36	27.89	27.95	29.32	28.90	30.02	27.03	25.11	28.20
European Union (EU)*	53.97	50.72	47.82	48.22	48.00	49.08	45.91	45.38	47.32
Total	83.33	78.61	75.78	77.54	76.90	79.10	72.94	70.49	75.52

Source: Author's calculation based on data by Agency for Statistics of BiH.

* 2004-2006 EU-25; 2007-2011. EU-27

Table 3. BiH Exports and Imports with the Western Balkans (2004-2011)

Description	2004	2005	2006	2007	2008	2009	2010	2011
Export (mil EUR)	558.07	719.35	868.58	1,086.32	1,272.93	1,075.04	1,300.86	1,467.95
Import (mil EUR)	1,412.38	1,594.42	1,627.70	2,064.77	2,407.60	1,896.61	1,881.80	1,993.59
Trade Balance (mil EUR)	-854.30	-875.07	-759.13	-978.45	-1,134.67	-821.57	-580.94	-525.64
Export/Import Coverage (%)	40.0	45.0	53.0	53.0	53.0	56.7	69.1	73.6

Source: Author's calculation based on data by Agency for Statistics of BiH.

Table 4. BiH IIT and BiH IIT with the Western Balkans, all industries and manufacturing industry (2004-2011)

Description	Share of IIT (G-L Index)								Average
	2004	2005	2006	2007	2008	2009	2010	2011	
Total IIT BiH	0.32	0.36	0.44	0.46	0.46	0.45	0.49	0.49	0.43
BiH IIT SITC 5-8	0.39	0.41	0.51	0.51	0.52	0.52	0.54	0.55	0.49
BiH IIT with WB	0.33	0.38	0.40	0.43	0.46	0.47	0.53	0.52	0.44
BiH IIT with WB SITC 5-8	0.49	0.55	0.58	0.61	0.63	0.62	0.62	0.58	0.59

Source: Author's calculation based on data by Agency for Statistics of BiH.

Table 5. Standard and Adjusted G-L Indices in BiH Trade with the Western Balkan Countries (2004-2011)

Country	2004		2005		2006		2007		2008		2009		2010		2011	
	GL	GL*	GL	GL*	GL	GL*	GL	GL*	GL	GL*	GL	GL*	GL	GL*	GL	GL*
Albania	0.04	0.13	0.02	0.04	0.01	0.01	0.01	0.02	0.01	0.02	0.04	0.18	0.01	0.05	0.01	0.08
Montenegro	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	0.16	0.52	0.18	0.61	0.17	0.64	0.16	0.62	0.15	0.63
Croatia	0.26	0.50	0.31	0.53	0.29	0.43	0.31	0.51	0.33	0.56	0.37	0.62	0.45	0.66	0.40	0.58
Kosovo	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	0.09	0.32	0.06	0.30	0.02	0.33	0.02	0.32	0.02	0.48
Macedonia	0.28	0.45	0.25	0.44	0.23	0.43	0.24	0.46	0.36	0.59	0.37	0.57	0.38	0.56	0.42	0.43
Serbia	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	0.41	0.58	0.40	0.56	0.41	0.57	0.39	0.51	0.37	0.46

Source: Author's calculation based on data by Agency for Statistics of BiH.

Legend: GL – aggregate uncorrected G-L index; GL* – aggregate corrected G-L index;

Table 6. BiH Intra-Industry Trade with the Western Balkan Countries

Country	Share of IIT (Aggregate G-L Index)								Average
	2004	2005	2006	2007	2008	2009	2010	2011	
Albania	0.04	0.02	0.01	0.01	0.01	0.04	0.01	0.01	0.02
Montenegro	n.a.	n.a.	n.a.	0.16	0.18	0.17	0.16	0.15	0.16
Croatia	0.26	0.31	0.29	0.31	0.33	0.37	0.45	0.40	0.34
Kosovo	n.a.	n.a.	n.a.	0.09	0.06	0.02	0.02	0.02	0.04
Macedonia	0.28	0.25	0.23	0.24	0.36	0.37	0.38	0.42	0.32
Serbia	n.a.	n.a.	n.a.	0.41	0.40	0.41	0.39	0.37	0.40
SCG*	0.40	0.42	0.47	-	-	-	-	-	0.45

Source: Author's calculation based on data by Agency for Statistics of BiH.

* Average G-L index has been calculated for eight-year period for Albania, Croatia and Macedonia. Average G-L index for Serbia and Montenegro (with Kosovo), i.e. SCG as the state union has been calculated for first three years of the period. Average G-L index for those three customs territories separately has been calculated for next five-year period.

Table 7. BiH Intra-Industry Trade with the Western Balkan Countries in manufacturing industry

Country	Share of IIT SITC 5-8 (Aggregate G-L Index)								
	2004	2005	2006	2007	2008	2009	2010	2011	Average
Albania	0.16	0.02	0.06	0.03	0.02	0.11	0.04	0.05	0.06
Montenegro	n.a.	n.a.	n.a.	0.12	0.16	0.23	0.16	0.13	0.16
Croatia	0.40	0.44	0.42	0.44	0.44	0.50	0.46	0.44	0.44
Kosovo	n.a.	n.a.	n.a.	0.10	0.09	0.02	0.03	0.02	0.05
Macedonia	0.32	0.28	0.32	0.32	0.45	0.48	0.51	0.58	0.41
Serbia	n.a.	n.a.	n.a.	0.59	0.53	0.57	0.58	0.57	0.57
SCG	0.58	0.63	0.69	-	-	-	-	-	0.62

Source: Author's calculation based on data by Agency for Statistics of BiH.

Table 8. BiH Intra-Industry Trade with Its Most Significant Trade Partners (2007-2011)

Country	Share of IIT (Aggregate G-L Index)					
	2007	2008	2009	2010	2011	Average
Croatia	0.31	0.33	0.37	0.45	0.40	0.37
Germany	0.29	0.29	0.28	0.33	0.32	0.30
Serbia	0.41	0.40	0.41	0.39	0.37	0.40
Italy	0.36	0.37	0.41	0.42	0.41	0.39
Slovenia	0.44	0.44	0.44	0.43	0.45	0.44

Source: Author's calculation based on data by Agency for Statistics of BiH.