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PRELIMINARY REPORTS

## The Comparative Analysis of Export Competitiveness of ex-Yu Countries

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**ABSTRACT** – *The paper deals with the analysis of ex-Yugoslav countries' export performance (Bosnia and Herzegovina, Croatia, Macedonia, Montenegro, Serbia and Slovenia) over the period 2006-2013. The paper is aimed at assessing these countries' export competitiveness and determining its dynamics in trade with the world. The analysis included the research into and comparison of export characteristics – the volume and dynamics of export flows, geographic and product export structure and concentration, technological export sophistication, export specialization expressed through revealed comparative advantage, intensity and direction of change in export structure. In order to gain a comprehensive insight into export competitiveness, a few indicators were used: Balassa RCA index, Michaely index, Herfindahl-Hirschman concentration indices, etc. The indices were calculated based on the information from relevant databases of the World Bank and International Trade Centre, aggregated at the second and sixth HS2002 level, for the eight-year period and/or for the first and the last year.*

*The research revealed that ex-YU countries' export performance is generally unsatisfactory, despite the progress that individual countries registered in the observed period. Most countries have comparative advantage in the products of traditional, declining industries, a high share of semi-products and primary products, and a negligible share of high-technology products in their export portfolio, a stagnating export structure, and a low degree of geographic and product export diversification. Mutual comparisons showed that the group is not homogenous and that, besides the described common characteristics, there are significant differences within the group in certain aspects of export competitiveness. The EU member-states, Croatia and particularly Slovenia, have a series of advantages compared to countries that are candidates and potential candidate. The greatest progress toward the improved export competitiveness was achieved by Serbia, while Montenegro got the poorest rating for export competitiveness*

**KEY WORDS:** *ex-YU countries, export competitiveness, export structure, revealed comparative advantages (RCA), export diversification, export concentration*

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## Introduction

The significance of exports as a given economy's growth factor depends on their volume, structure and trend, which is related to the issue of studying a country's export performance and competitiveness. Export competitiveness is primarily understood as a country's ability to sell commodities in foreign markets at the price and quality that can be compared to competition, while achieving the foreign-trade balance. Export competitiveness comprises different aspects of export performances including trend, structure, diversification and quality of exports.

The paper is aimed at assessing export competitiveness of the countries of former Yugoslavia (ex-YU countries) and determining its dynamics in the trade with the world. The research focuses on export characteristics of six ex-YU countries – Bosnia and Herzegovina (BiH), Montenegro, Croatia, Macedonia, Serbia and Slovenia in the period 2006-2013. The research included a comparative analysis of export dynamics and structure (production, geographic and technological one), of changes in export portfolio, geographic and product export concentration and revealed comparative advantage of the observed countries. The research results should provide for the identification of advantages and shortages of analyzed countries regarding export competitiveness that would serve as a basis for definition of appropriate recommendations aimed at improving their export positions.

In order to obtain a comprehensive insight into export competitiveness, a few different indicators were used: indicators of export composition and revealed comparative advantage (Balassa RCA index, Michaely index), indicators of export diversification (share of top five export products and top five export markets, the number of export products, Herfindahl-Hirschman indices of geographic and sectoral export concentration), and export quality indicators (export product classification by technology content).

The data gathered from relevant databases of the World Bank<sup>2</sup> and International Trade Centre<sup>3</sup> were analyzed at the second level of Harmonized Commodity Description and Coding System classification (HS 2002). The indicators were calculated, compared and interpreted at the annual export level for the period 2006-2013, and/or the first and last year of the period (2006 and 2013 respectively).

## Theoretical background

The concept of competitiveness is extremely broad and comprehends a few different aspects. What everybody agrees about is the complexity of concept and of its theoretical basis. In the same time, there is no consensus about the definition of competitiveness, regardless of the fact that the issue has been the topic of a number of theoretical and empirical studies for years. This leaves space for different definitions, which define this term at the macro, mezzo or micro level, while some try to integrate all the three levels. Mladen Kovačević (2002) believes that all the described dimensions of competitiveness are essentially mutually conditioned. Janno Reiljan and Dorel Tamm (s.a.) also consider competitiveness

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<sup>2</sup>World Bank. World Integrated Trade Solutions (WITS). Database. (available at: <http://wits.worldbank.org/wits/>)

<sup>3</sup>International Trade Center (ITC). Trade Map. (available at: <http://www.trademap.org/Index.aspx>)

multidimensional concept (i.e. four-dimensional concept); they created a scheme including as follows: extent of competitiveness (broader and narrower concept), area of competitiveness (economic, political, social etc. concept of competitiveness), "location" of competitiveness (concepts of internal, regional or international, i.e. global competitiveness), and management of competitiveness (international agreements, government policies, company strategies, etc.). In the context of this scheme our paper focuses on the international economic competitiveness at the macro level.

The most significant contribution to the development of the broader concept of international competitiveness was provided by Michael Porter (1991). Before the emergence of Porter's concept, which was a distinctive revolution in the theory of international trade and was therefore labeled as a "new paradigm", the development of thought on international trade and, tentatively, on international competitiveness, was long dominated by the concept of comparative advantages founded on David Ricardo's theory of the 19<sup>th</sup> century. Based on the premises of perfect competition, free trade, constant costs, immobility of production factors and the "world" without technological and other changes, the concept offered an incomplete and static explanation of reasons for international trade and the structure of the trade, which was adopted by neo-classic theories that followed, the most notable one being the Heckscher-Ohlin's theory. As opposed to the concept of comparative advantages elaborated in the traditional theories of international trade, and partly in individual more recent theories, the concept of competitive advantages developed by Porter is not limited to countries with the favorable factor endowments (natural resources, population), nor is static – a country can create the new so-called reinforcement factors, and the focus of explaining the international trade shifts from a country to an industry or product. Porter's understanding of international competitiveness is related to the development of competitiveness first in the national market. In order to answer the question as to why some countries are more successful in certain industries compared to some others, Porter develops his famous "diamond" as a system with four basic determinants of competitive advantages, with strong interaction: production factor conditions, demand conditions, related and supporting industries, firm strategy, structure and rivalry. Porter added two new factors, government policy and chance, which support the described system. (Michael Porter, 1991).

One of the definitions that attracted some attention at a time and that highlights the macro-dimension of international competitiveness in a narrower sense is the definition by Bruce R. Scotta and George C. Lodgea (1985) who understand a country's competitiveness as its ability to most rationally employ the national resources in accordance with international specialization and trade, so that this ultimately leads to the growth of real income and the standard of living. Scott (1985) also defines the international macro-competitiveness as a country's ability to produce, distribute and service products in international framework in the competition with goods and services from other countries, though in a way that secures the increase in the standard of living. Jan Fagerberg (1988) believes that "international competitiveness of a country's economy is its ability to realize central economic policy goals, especially growth in income and employment, without running into balance of payment difficulties". A number of authors also relate the concept of international competitiveness to the national economy's ability to ensure economic growth without trade imbalance, i.e. to

produce goods and services which will ensure the growing real income both in the domestic and in the international market. (Lorena Škuflić, 1999).

According to some narrower definitions, international competitiveness is completely equaled to a country's exporting ability. Experts of the United Nations' Conference on Trade and Development claim that a country's global ability to export reflects the successfulness of state enterprises and their competing ability, which in turn depends on factors from their business environment (UNCTAD, 1987). This leads us to the narrower understanding of international competitiveness, which boils down to the export competitiveness. Export competitiveness is defined as a country's ability to sell commodities in foreign markets, at the price and quality that can be compared to competitors (US International Trade Commission, 2010). Christian H.M. Ketels (2010) defines export competitiveness as "... an increase in ability to sell domestic goods and services in the world market."

### **Applied methodology**

Same as there is no consensus about the definition of international competitiveness, there is no universally accepted way of its empirical measurement. International competitiveness can be analyzed using a number of quantitative and/or qualitative indicators, most of which are related to the conditions and trends in the foreign trade sector (Lorena Škuflić, 1999), primarily to export characteristics and dynamics. The volume, structure and dynamics of exports, as well as the attitude toward imports affect its significance for economic growth and development.

There are a few dozens of different export competitiveness indicators, which can be classified according to different criteria. According to the World Bank's classification (World Bank, 2011), from the viewpoint of their purpose, i.e. the export characteristic that should be "measured", one can distinguish three groups of export competitiveness indicators: a) indicators of export composition and revealed comparative advantages; b) export diversification indicators, and c) export quality indicators. Indicators of export composition and revealed comparative advantages are Balassa revealed comparative advantages index (Balassa RCA), Michaely index (MI), trade performance index (TPI). Use of these indicators is primarily aimed at establishing sectoral specialization. Export diversification indicators, which mostly indicate the degree of production or geographical concentration, consist of Herfindahl-Hirschman index (HHI), total entropy index (TPEI) and index of export market penetration (IEMP). Export quality indicators include export technology content and sophistication, which in turn indicate the technological structure. There are a few classifications of export technology content, the four most significant ones being: the classification proposed by the Organization for Economic Cooperation and Development (OECD, 2002), classification proposed by Joe Tidd and John Bessant (2009), classification by the International Trade Department of the World Bank (2011), and classification of the International Trade Centre (International Trade Centre, n.d.).

In order to analyze export competitiveness as comprehensively as possible, and to get a full picture of export competitiveness, it is necessary to use a few indicators. For the actual research, a shortlist of indicators from the described classification was made, which includes those that were assessed as the most suitable from the aspect of their purpose and the

availability of data for their calculation. The selected indicators include Balassa index of revealed comparative advantage, Michaely index in its modified expression, Herfindahl-Hirschman index, ITC classification of products by technology content etc.

### Balassa RCA Index (BI)

In his paper „Trade Liberalization and 'Revealed' Comparative Advantage“ of 1965, Bella Balassa first used the index of 'revealed comparative advantage' which is based on exports as the only variable. Since that time original Balassa index has become the most frequently used index of revealed comparative advantage. The index of revealed comparative advantage is a measure of a country's relative advantage or disadvantage in a certain industry represented by trade flows (World Integrated Trade Solutions, 2014). BI uses the trade pattern to identify the sectors in which an economy has a comparative advantage, by comparing the country of interests' trade profile with the world average. (Mia Mikić and John Gilbert, 2009).

The original Balassa RCA index reflects the relative export structure, and is calculated as the ratio between a given product's export share in the country's overall exports and the share of the product's global exports in the overall world's export (Balassa, 1989):

$$BI_{[cst/w]} = \frac{\frac{X_{cs}}{X_c}}{\frac{X_{ws}}{X_w}} = \frac{\frac{X_{cs}}{X_{ws}}}{\sum_{s=1}^S \frac{X_{cs}}{X_{ws}} \frac{X_{ws}}{X_w}} = \frac{\frac{X_{cs}}{X_{ws}}}{\frac{X_c}{X_w}} \quad (1)$$

$c$  –given country;

$w$ – all countries (world) or a group of countries;

$s$  – given sector;

$S$  – all the sectors included in the analysis;

$t$  – time period;

BI reveals that a country has a comparative disadvantage in sector  $s$ , if  $0 < BI < 1$ , while it has a relative advantage in sector  $s$ , if  $1 < BI < \frac{X_w}{X_c}$ .

Balassa index allows estimates of export capability of a country's individual industries by ranking and comparing relative shares of different industries' exports within the country (cross-sector comparison), by ranking and comparing relative shares of different countries' exports at a sectoral level (cross-country comparison), and by revealing changes in the relative shares over time. (Elias Sanidas and Yousun Shin, 2010)

### Michaely index (MI)

Michael Michaely (1962, 1967) construed the so-called index of dissimilarity for a country, with the aim of measuring the total dissimilarity in the commodity composition of trade. The index value ranges within the 0-1 interval; the higher the index value, the less similar are commodity compositions of exports and imports of the observed country.<sup>4</sup>

<sup>4</sup> MI reaches the maximum value in the case when there is total dissimilarity, which means that all products are only exported or only imported. The minimum index value (MI=0) occurs in the case of

Michaely index (MI) has a broad range of applications. Its use is recommended when measuring the degree of similarity between trade patterns. It is used for the comparison of trade patterns, e.g. the comparison of a country's import and export patterns, export (import) patterns of two countries or a group of countries, etc. (Pablo Coto-Millán, 2004). It is also used as a measure of international trade specialization at a sector level (Keld Laursen, 1998). MI is an excellent indicator of the dynamics of a country's export structure, i.e. the dynamics of revealed comparative advantage. However, it indicates the intensity of change, rather than its direction (Coto-Millán, 2004; Halilbašić, 2012).

The formula for calculating the dynamics of a country's export structure using MI, a synthetic indicator of dissimilarity, is given below:

$$MI_{t \in [1,2]} = \frac{1}{2} \cdot \sum_{s=1}^S \left| \frac{x_{cs2}}{x_{c2}} - \frac{x_{cs1}}{x_{c1}} \right| \quad (2)$$

$t$  – years being compared;

$x_{cs2}$  – exports of sector  $s$  of country  $c$  over time  $t=2$ ;

$x_{c2}$  – total exports of country  $c$  over time  $t=2$ ;

MI advantage is the simplicity of result interpretation, since it takes value from 0 (perfect stability of specialization patterns) to 2 (absolute mobility of specialization patterns).

### Herfindahl-Hirschmanov index (HHI)

Although it was first used as a measure of asymmetry, in the 1940s, Herfindahl-Hirschman index was related to the economic theory only in 1976 (Keith Cowling and Michael Waterson, 1976).<sup>5</sup> HHI can be used as a measure of the degree of a country's export concentration, when it is calculated using the following formula (Juan Felipe Mejía, 2011):

$$HHI_c = \sum_s \left( \frac{x_{cs}}{x_c} \right)^2 \quad (3)$$

$x_{cs}$  – value of exports of sector  $s$  of country  $c$ ;

$x_c$  – value of total exports of country  $c$ .

The lower HHI value indicates the higher export (production) dispersion and a lower degree on export concentration and specialization. A lower value of HHI is also a sign of a higher degree of export diversification.

We distinguish between HHI production concentrations, which measure export dispersion from the aspect of export products, and HHI geographical concentrations, which

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total, perfect similarity, when each product is both exported and imported, proportional to its share in total exports and imports. (Snježana Brkić, 2010)

<sup>5</sup> Since 1984, regulatory institutions in the USA started using HHI as a measure of concentration in judicature, banking, in the area of electric power and aviation (Mark G. Lijesen, 2004).

measure the same but from the export partners' aspect (World Integrated Trade Solutions, 2013).

### **Technology content of exports**

The paper uses ITC classification, which provides an insight into the percentage share of five types of products of different levels of processing in a country's exports. These are: primary products, semi-finished products, capital equipment, consumer goods and high-technology products (International Trade Centre, s.a.).

## **Research results**

### **Exports dynamics and performances**

Over the observed period (2006-2013), all former-Yugoslav countries registered an increase in their trade. Compared to the beginning of the period, almost all the countries registered an increase in exports (except for Montenegro) and an increase in imports (except for Croatia). In this respect, the highest value of commodity exports and imports was achieved by Slovenia<sup>6</sup>, and the lowest by Montenegro. BiH ranked fourth by the amount of exports, and fifth by the amount of imports both in the beginning and at the end of the period<sup>7</sup>.

Each country of former Yugoslavia imported more products than it exported over the observed period, which resulted in the continuous trade deficit. In 2013, the highest trade deficit in absolute terms was registered by Croatia – 9.03 billion USD, although, when compared to 2006, the deficit actually decreased (from 11.13 billion USD). With the deficit of 4.60 billion USD in 2013, BiH retained the fourth position. A decrease in the value of deficit in 2013 compared to 2006 was registered by Slovenia<sup>8</sup>, Serbia and Croatia.<sup>9</sup>

Trends in the observed countries' exports significantly coincide. After growth in 2007 and 2008, commodity exports decreased in the year of economic and financial crisis (2009), while in the following four years (2010-2013) exports of all the observed countries continued to increase, though of different intensities. All ex-Yu countries, except for Montenegro, registered an increase of commodity exports in the observed period. Serbia experienced the evident increase and doubled its exports compared to 2006. (Figure 1)

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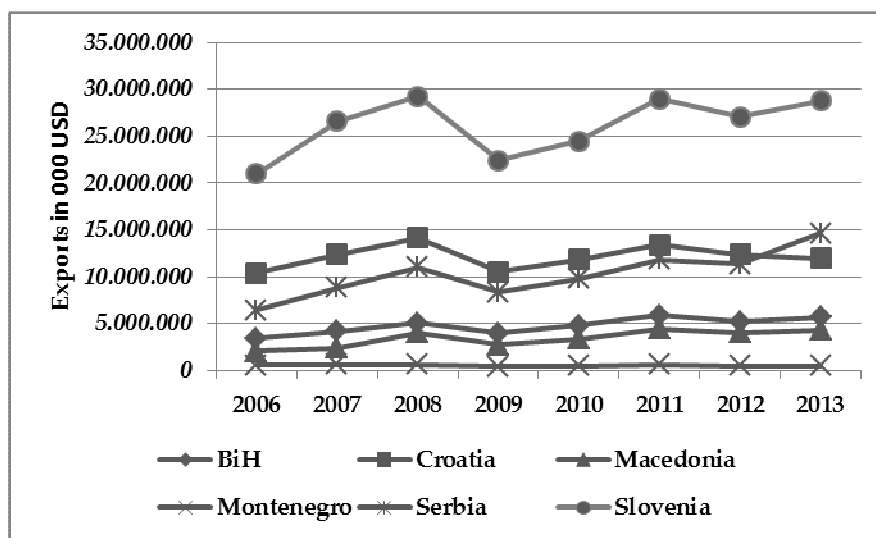
<sup>6</sup> With the recorded value of commodity exports of 28.73 billion USD and commodity imports of 29.38 billion USD in 2013, Slovenia maintained the top position it had in 2006 as well.

<sup>7</sup> The volume of BiH trade for 2013 amounted to 15.98 billion USD, which is by 5 billion USD or 45.46% higher compared to its trade in 2006. In the period 2006-2013, the volume of BiH trade was significantly determined by imports, which was twice as high as exports over the entire period (10.29 billion USD of imports versus 5.69 billion USD of exports in 2013).

<sup>8</sup> From 2 billion USD in 2006 to 640 million USD deficit in 2013.

<sup>9</sup> The table with all the data is available in the appendix to the paper.

Figure 1. Exports Dynamics of Ex-YU Countries, in 000 USD, 2006-2013



Source: Authors on the basis of data from ITC, Trade Map and State Statistical Office of Republic of Macedonia

Export increase by a greater rate than imports also resulted in an increase of the degree in export-import coverage in all the countries in 2013 compared to 2006, except in Montenegro, which registered a decrease. Montenegro has the lowest level of export-import coverage in both observed years - 30.22% in 2006 and 21.05% in 2013. The highest value of coverage was registered by Slovenia - 91.18 and 97.82% respectively. Slovenia's export revenues almost fully cover payments due to commodity imports. The greatest increase of export-import coverage, of over 20 percent, was registered by Serbia (from 48.80 to 71.11%), which allowed it to move from the third to the second position, while BiH, Croatia and Macedonia managed to raise the coverage by 9 to 10 percent and mostly maintained previous positions.<sup>10</sup>

### Exports structure

Over the observed period, exports of most ex-Yu countries were dominated by manufactures of metal (particularly aluminum and products of aluminum, iron and steel), machinery manufactures (nuclear reactors, electrical machinery), manufactures of mineral fuel industry, and wood manufactures. (Table 2)

Ex-Yugoslav countries' export portfolios are dominated by products characteristic of the world export markets that are growing below the average world rate of 10%, which coincides with the results obtained by Lucia Orszaghova et al. (2013) through the analysis of export portfolios of four ex-Yugoslav countries<sup>11</sup> for the period 1999-2010. BiH and Serbia export products which increased their respective shares in the world export markets, i.e. products that are included in the "winners in declining sectors"<sup>12</sup>. Montenegro, Croatia, Macedonia

<sup>10</sup> Authors' own calculation on the basis of data from ITC, Trade Map and State Statistical Office of Republic of Macedonia.

<sup>11</sup> The analyzed countries included: Montenegro, Croatia, Macedonia and Serbia.

<sup>12</sup> In order to present a country's export performance compared to trends in world demand and estimate the potential of long-term export growth, ITC uses the so-called „bubble“ graphs. The



and Slovenia export products which decreased their share in the world export markets that grow below the rate of 10%, and their export portfolios are thus dominated by “losers in declining sectors”. (ITC, 2014)

All the ex-Yugoslav countries mostly focus their export on semi-products and least on the high-technology products. In their commodity export structure, the share of semi-products ranged from about 55-56% in the case of Slovenia, Croatia and Macedonia to 61% in Bosnia and Serbia, while it was the highest in Montenegro, where it amounted to 74% (in 2013). They are followed by consumer goods, with the market share that varied from 15 to 22% in all the countries except for Montenegro (only 5.2%). Share of primary products is significant in most countries as well except for Slovenia (only 4.1%.) Slovenia and Croatia registered a higher share of capital equipment than of primary products. The lowest share of capital equipment was registered in Montenegro and BiH. No significant share of high-technology products was registered in the observed years. In 2013, high-technology products had a very low share in all the countries' commodity exports. BiH<sup>13</sup> and Montenegro registered the lowest shares of these products in commodity exports, and they are followed by Macedonia and Serbia. (Table 1)

Table 1. Technological Export Structure of Ex-YU Countries, 2013

Products <sup>14</sup>	BiH	Montenegro	Croatia	Macedonia	Slovenia	Serbia
Primary products	10.6	16.3	10.1	13.6	4.1	12
Semi-products	60.6	73.6	54.8	54.4	56.6	61.1
Capital equipment	7.8	4.7	17.5	10.1	18.4	10.6
Consumer goods	18,3	5.2	15.7	21.9	20.4	15.4
High-technology products	1.4	1.3	6.6	2.8	5.1	2.6

Source: Authors on the basis of data from ITC, Trade Competitiveness Map

With respect to geographic orientation of ex-Yu countries' exports in the observed period, they registered the greatest share of their exports and imports with the European Union as a whole. To illustrate this point, in 2013 almost all the countries, except for Montenegro achieved an average of 60% of their exports in the EU27 market – Montenegro 28.3%, BiH 57.8%, Serbia 58.1%, Croatia 58.2%, Macedonia 62.8%, and the highest share was achieved by Slovenia – 68.5%. (WTO, 2013) Presented data lead to the conclusion on significantly high export dependence of these countries from the EU market. Particular relations each of them with the EU in terms of their membership status or status in the process of association to the

graphs provide information on the value of product exports and compare the annual growth of the country's share in world exports to the annual increase in world demand over a five-year period (International Trade Centre, 2014), and are divided into four segments, where products are classified as: winners in growing sectors (champions), losers in growing sectors, winners in declining sectors or losers in declining sectors.

<sup>13</sup> These products' share in Croatia's commodity exports was almost five times higher compared to the same products' share in BiH commodity exports.

<sup>14</sup>Note: There are share of 1-2% of unclassified products for every country.

Union<sup>15</sup> create possibilities for further growth of export to the EU market and even higher export dependence in the next future.

### **Revealed comparative advantages**

Ex-YU countries export specialization compared to the world was analyzed based on the revealed comparative advantages, founded on the calculation of Balassa index.

The highest values of BI index for BiH both in the beginning and in the end of the period were measured in the production of wood and articles of wood, footwear, explosives, aluminum and articles thereof, furniture, raw hides and skins and leather, etc. Six out of ten sectors with the highest BI's registered an increase in specialization, while the others registered a decrease. In Montenegro, the highest BI's were identified in the production of aluminum and articles thereof, raw hides and skins and leather, beverages, explosives, wood and articles of wood, tobacco and manufactured tobacco substitutes, etc. Most sectors registered an increase in specialization, some even twofold (raw hides and skins, vegetables); however, BI for aluminum production decreased twofold. The highest BI values for Croatia were found in the production of arms and ammunition, wood and articles of wood, fertilizers, salt, sulphur, earths and stone, miscellaneous edible preparations, live animals, etc. An increase in specialization was registered by seven out of ten product groups, and was the greatest in the production of arms and ammunition (three times) and live animals (four times)<sup>16</sup>. Macedonia registered the greatest comparative advantage in the production of tobacco and manufactured tobacco substitutes, miscellaneous chemical products, articles of apparel, iron and steel, vegetables, etc. Specialization decreased in six out of ten products, but BI for chemical products increased almost seven times. With respect to Serbia, comparative advantage was revealed in the production of arms and ammunition, fruits, products of the milling industry, cereals, sugars and sugar confectionery, etc. All the products registered a decrease in comparative advantage. Slovenia revealed the greatest comparative advantage in the production of aluminum and articles thereof, wood and articles of wood, pharmaceutical products, tanning or dyeing extracts, man-made filaments etc. An increase in comparative advantage was observed in almost all top ten products, but values of BI's of top 5 industries are much lower than for top 5 of other countries.<sup>17</sup> While top ten product groups where BiH, Montenegro and Macedonia revealed comparative advantage had a significant total share in these countries' exports (37%, 39% and 59% respectively), the total export share of Serbian, Croatian and Slovenian product groups with the greatest comparative advantages was relatively low (19%, 20% and 26% respectively). However, the fact remains that the total export share of ten products with highest BI decreased in all the countries, most in Montenegro (almost twofold).

There are no major similarities in the comparative advantage patterns' among the observed countries if analyses top 10 lists - there are only three products that are the same on

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<sup>15</sup> Slovenia (2004) and Croatia (2013) are the EU member – states, Macedonia (2005), Montenegro (2010) and Serbia have a status of candidate countries, and only BiH has the status of a potential candidate (2008).

<sup>16</sup> The greatest decrease of BI – more than four times – was registered in the production of ships, boats and floating structures.

<sup>17</sup> The table with top ten industries by BI index for each country is provided in the appendix.

the lists<sup>18</sup>). All the countries have comparative advantage in the production of aluminium and articles thereof, and four of them (except for Macedonia and Serbia) also in the production of wood and articles thereof.

The intensity of change in export structure was measured using Michaely index (MI). MI was used as an indicator of the dynamics of a country's export structure, or the dynamics of revealed comparative advantage. According to MI, ex-Yugoslav countries mostly experienced the perfect stability in the 2006-2013 period, and in some cases a very low intensity of change in their most significant industries' exports. Accordingly, MI reveals that ex-Yugoslav countries are not export competitive in the world with their most significant industries' products.

Table 2. Top 5 Export Industries of Ex-YU Countries and Michaely Index, 2006-2013

Bosnia and Herzegovina		Croatia	
Industry	MI	Industry	MI
27 - Mineral fuels, mineral oils etc.	0.02	27 - Mineral fuels, mineral oils etc.	0.00
94 - Furniture	0.01	84 - Nuclear reactors, boilers,	0.01
76 - Aluminium and articles thereof	0.02	85 - Electrical machinery and	0.00
44 - Wood and articles of wood	0.01	44 - Wood and articles of wood	0.01
84 - Nuclear reactors, boilers,	0.02	30 - Pharmaceutical products	0.01
Macedonia		Montenegro	
Industry	MI	Industry	MI
72 - Iron and steel	0.04	27 - Mineral fuels, mineral oils etc.	0.14
38 - Miscellaneous chemical products	0.07	76 - Aluminum and articles thereof	0.18
62 - Articles of apparel, not knitted	0.03	72 - Iron and steel	0.03
84 - Nuclear reactors, boilers,	0.03	22 - Beverages, spirits and vinegar	0.00
85 - Electrical machinery and	0.01	44 - Wood and articles of wood	0.00
Serbia		Slovenia	
Industry	MI	Industry	MI
87 - Vehicles other than railway or	0.07	85 - Electrical machinery and	0.01
85 - Electrical machinery and	0.03	87 - Vehicles other than railway or	0.01
84 - Nuclear reactors, boilers,	0.01	84 - Nuclear reactors, boilers,	0.01
39 - Plastics and articles thereof	0.00	30 - Pharmaceutical products	0.02
27 - Mineral fuels, mineral oils etc.	0.01	27 - Mineral fuels, mineral oils etc.	0.02

Source: Authors on the basis of data from ITC Trade Map

MI value for BiH shows that in the period 2006-2013 there was no change in the intensity of exports of mineral fuels, furniture, aluminium and manufactures thereof, wood manufactures and nuclear reactors. In the same period, Croatia and Slovenia registered the perfectly steady exports of their top five industries. Montenegro registered a very low intensity of change in the exports of aluminum and manufactures thereof and mineral fuels. A low intensity of change was also registered by Macedonia in the exports of various manufactures of chemical industry, and by Serbia in the exports of vehicles. Other

<sup>18</sup> Only on lists for top ten products with highest BI for Serbia and Montenegro four products are the same.

Montenegrin, Macedonian and Serbian industries registered the perfect stability of exports in the same period. (Table 2)

### Exports concentration

By the number of ex-Yu countries' export markets whose individual values were higher than 100,000 USD in 2013, Slovenia is ranked highest, with 96 larger export markets, and Montenegro is ranked lowest, with 42 larger export markets. An increase in the number of export markets in the period 2006-2013 was registered by BiH, Montenegro and Macedonia, while the number of export markets decreased for Slovenia, Croatia and Serbia. Regardless of the decrease in the number of export markets, these three countries maintained their top three rankings among ex-YU countries. BiH is the only country that improved its ranking (from five to four), Montenegro remained at the bottom (although the number of its export markets increased threefold), while Macedonia moved from the fourth to the fifth position. (Table 3)

Table 3. Number of Export Markets of Ex-YU Countries, 2006 and 2013

Country	Number of Markets > 100.000 USD		
	2006	2013	Growth/Fall
Bosnia and Herzegovina	61	76	↑
Croatia	95	82	↓
Macedonia	62	66	↑
Montenegro	16	42	↑
Slovenia	103	96	↓
Serbia	81	78	↓

Source: Authors on the basis of data from WITS, Trade Outcome Indicators

According to the values of Herfindahl-Hirschmann index of geographic export concentration (HHI) in 2013, Serbia and Croatia registered the highest, and Macedonia and Montenegro the lowest export dispersion of all ex-YU countries (HHI=0.06 versus HHI=0.16<sup>19</sup>) In the period 2006-2013, most countries, except for Macedonia and Serbia, increased the degree of their geographic export diversification. Although the degree of its geographic concentration remained the same, Serbia retained the first position with the most dispersed exports of all ex-YU countries, while Croatia joined it at this position, and followed by Slovenia. BiH decreased the degree of export concentration (from 0.10 to 0.80), and thus moved from the fourth to the third position. Macedonia is the only ex-Yugoslav country which registered the increase in geographic exports concentration in the observed period.<sup>20</sup> (Table 4)

<sup>19</sup> The lower value of HHI index is a sign of greater export dispersion – a higher degree of geographic diversification, i.e. a lower degree of export geographic concentration and specialization.

<sup>20</sup> Compared to the exports of fast-growing economies (BRIC countries), ex-YU countries' exports were twice less geographically dispersed. (Vedrana Bosić, 2015.)

Compared to the exports of fast-growing economies (BRIC countries), ex-YU countries' exports were twice less geographically dispersed. (Vedrana Bosić, 2015.)

Table 4. Geographic Export Concentration of Ex-YU and BRIC Countries, 2006 and 2013

Country	HHI Geographic Exports Concentration		
	2006	2013	Change
Bosnia and Herzegovina	0.10	0.08	↑diversification
Croatia	0.09	0.06	↑diversification
Macedonia	0.11	0.16	↑concentration
Montenegro	0.24	0.16	↑diversification
Slovenia	0.08	0.07	↑diversification
Serbia	0.06	0.06	no change
<b>Ex-YU Average</b>	<b>0.11</b>	<b>0.10</b>	↑diversification
Brazil	0.05	0.06	↑concentration
China	0.08	0.07	↑diversification
India	0.05	0.04	↑diversification
Russia	0.04	0.05	↑concentration
<b>BRIC Average</b>	<b>0.06</b>	<b>0.05</b>	↑diversification

Source: Authors on the basis of data from WITS, Trade Outcome Indicators

Sectoral export concentration was analyzed by determining the number of exported products of the observed countries, and by calculating and comparing HHI of sectoral export concentration for 2006 and 2013.

By the number of exported products with the export values higher than 100,000 USD, Slovenia is ranked highest, with 2,417 products, while Montenegro is ranked lowest among ex-Yugoslav countries, with 198 products. In the 2006-2013 period, most ex-YU countries, except for Montenegro and Croatia, increased the number of their products of higher export value. The greatest increase (of some 300 new products) was registered by Serbia, which thus improved its ranking from third to second. Slovenia retained the first position. Croatia moved from the second to the third position. (Table 5)

Table 5. Number of Exports Products of Ex-YU Countries, 2006 and 2013

Country	Number of Products > 100.000 USD		
	2006	2013	Growth/Fall
Bosnia and Herzegovina	805	1,022	↑
Croatia	1,676	1,534	↓
Macedonia	607	668	↑
Montenegro	201	198	↓
Serbia	1,400	1,701	↑
Slovenia	2,161	2,417	↑

Source: Authors on the basis of data from WITS, Trade Outcome Indicators

HHI of sectoral export concentration for 2006 and 2013 revealed a high degree of concentration for all the observed countries<sup>21</sup>, which indicates a low diversity in export supply. (Table 6)

Table 6. Sectoral Export Concentration of Ex-YU Countries, 2006 and 2013<sup>22</sup>

Country	HHI of Product Concentration		
	2006	2013	Change
Bosnia and Herzegovina	0.02	0.01	↑ diversification
Croatia	0.01	0.01	no change
Macedonia	0.02	0.04	↑ concentration
Montenegro	0.34	0.12	↑ diversification
Slovenia	0.01	0.01	no change
Serbia	0.01	0.01	no change
<b>Average Ex-YU Countries</b>	<b>0.07</b>	<b>0.03</b>	↑ diversification
Brazil	0.01	0.03	↑ concentration
China	0.01	0.01	no change
India	0.02	0.03	↑ concentration
Russia	0.17	0.17	no change
BRIC Average	0.05	0.06	↑ concentration

Source: Authors on the basis of data from WITS, Trade Outcome Indicators

Most countries (four out of six in the observed sample) registered the same degree of export concentration in 2013. Croatia, Slovenia and Serbia retained the same value of HHI of sectoral export concentration of 0.01 as in the beginning of the observed period and were, in 2013, joined by BiH. Compared to 2006, only BiH and particularly Montenegro registered an increase in export dispersion. Montenegro decreased the degree of concentration almost three times (from HHI=0.34 to HHI=0.12), though it was not enough to push it from the last position by export dispersion compared to the other countries. Only Macedonia registered deterioration, in terms of an increase in the degree of export product concentration and specialization. Over the observed period, ex-YU countries registered a decrease (from 0.07 to 0.03) while fast-growing countries experienced an increase (from 0.05 to 0.06) in the average value of HHI of product concentration, whereby China is the country with the highest export product diversification in the observed period.

### Concluding remarks

The analysis of ex-YU countries' export competitiveness in the period 2006-2013 generally indicated their unsatisfactory export performance, despite the progress that some of them registered over the observed period. The weaknesses are primarily related to the product export structure, patterns of comparative advantages, export quality in terms of its

<sup>21</sup> A lower value of HHI of export product concentration is a sign of greater export dispersion (sectoral diversification), i.e. a lower level of sectoral concentration and specialization, and vice versa.

<sup>22</sup> Data were analysed at 6th aggregation level of HS 2002 classification.

technological sophistication, and the degree of geographic and product export diversification.

All the discussed countries (except for Montenegro) increased their exports over the observed period; however, their role in the world markets remained minor. Although all the countries still reveal the trade deficit, they managed to achieve higher export-import coverage due to faster export growth. These countries' exports are dominated by the products of traditional, declining industries, with an extremely high share of semi-products, primary products and consumer goods, while the share of high-technology products is negligible. Such an inadequate export structure in terms of the level of processing and technology contents was retained throughout the observed period. Despite a certain increase in export dispersion (in most countries except for Macedonia and Serbia), increase in the number of export products (except for Montenegro and Croatia), and a decreased share of main export industries, ex-YU countries' exports still show a high level of geographic and product concentration, which means a great export dependence on a smaller number of markets and a smaller number of products.

The highest revealed comparative advantage of these countries are mostly observed in the traditional sectors, such as production of metals and articles thereof, wood and articles thereof, apparel, etc. In this respect, the comparative advantage patterns reveal perfect stability in the observed period, almost without emergence of comparative advantages in new sectors. Some changes in comparative advantages patterns only refer to an increase in the level of specialization in export sectors and decrease in total export share of product groups with most revealed comparative advantages.

Based on a few analyzed indicators, the best export performance was registered by ex-YU countries which are EU members – primarily Slovenia and then Croatia, compared to the countries that have the status of candidate or potential candidate. Over the observed period, both countries registered an increase in exports, increase in export-import coverage and a decrease in trade deficit, with Slovenia in the lead, since it almost achieved the foreign-trade balance. Compared to the other countries in the sample, EU members increased the degree of specialization in the sectors with revealed comparative advantages, registered a higher level of export dispersion in terms of increasing the number of export products and the number of export markets, and of increasing the degree of product export diversification; in the same time they also register a more favorable technology export structure by the level of product processing.

The greatest progress in the observed period was registered by Serbia, with respect to various aspects of export competitiveness, except for the fact that the number of export markets and the degree of specialization in all the sectors with comparative advantages decreased. Despite the progress in some segments, BiH and Macedonia's export competitiveness can be assessed as relatively stagnant and less favorable compared to the three previously described countries. The poorest rating of export competitiveness was achieved by Montenegro, due to deterioration in trends of a few indices.

Research results point to the need both for a further increase in exports and the improvement of its structure in terms of increasing the diversity of export supply and improving the technology content of export products, which in turn requires modernization of industries, as well as support by industrial and other economic policies makers.

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## Appendices

Table 1. Merchandise Exchange of Ex-YU Countries, 2006 and 2013

COUNTRY	in 000 USD					
	IMPORT		EXPORT		DEFICIT	
	2006	2013	2006	2013	2006	2013
BiH	7,559,256	10,294,930	3,427,782	5,687,314	-4,131,474	-4,607,616
Croatia	21,502,494	20,953,444	10,376,964	11,927,531	-11,125,530	-9,025,913
Macedonia	3,762,715	6,599,824	2,041,265	4,266,855	-1,721,450	-2,332,969
Montenegro	1,841,505	2,348,873	556,459	494,376	-1,285,046	-1,854,497
Serbia	13,172,330	20,550,990	6,427,892	14,613,752	-6,744,438	-5,937,238
Slovenia	23,013,428	29,375,441	20,982,713	28,734,599	-2,030,715	-640,842

Source: Authors on the basis of data from ITC, Trade Map and State Statistical Office of Republic of Macedonia

Table 2. Top 10 Industries of Ex-YU Countries, by BI and Export Share, 2006 and 2013

Bosnia and Herzegovina				
Industry	2006		2013	
	BI	Share	BI	Share
44 - Wood and articles of wood	9.9	8.9	9.6	6.7
64 - Footwear	9.3	5.7	9.3	6.5
36 - Explosives	4.1	0.1	8.5	0.2
76 - Aluminum and articles thereof	9.9	11.4	8.4	7.1
94 - Furniture	6.5	7.6	8.2	10.3
41 - Raw hides and skins and leather	8.1	2.0	7.6	1.5
28 - Inorganic chemicals	7.4	5.0	6.6	4.0
66 - Umbrellas	1.8	0.0	5.0	0.1
46 - Manufactures of straw, of esparto	4.3	0.1	4.4	0.1
17 - Sugars and sugar confectionery	2.0	0.5	3.4	0.9
<b>Total Share in Exports of BiH</b>		<b>41.3</b>		<b>37.4</b>
Montenegro				
Industry	2006		2013	
	BI	Share	BI	Share
76 - Aluminum and articles thereof	50.3	57.7	26.3	22.2
41 - Raw hides and skins and leather	3.5	0.9	8.6	1.7
22 - Beverages, spirits and vinegar	9.3	5.4	8.1	5.0
36 - Explosives	5.0	0.1	7.3	0.2
44 - Wood and articles of wood	5.0	4.5	7.1	4.9
24 - Tobacco and manufactured tobacco substitutes	0.5	0.1	6.7	1.5
11 - Products of the milling industry	0.2	0.0	5.1	0.5
68 - Articles of stone, plaster, cement	0.6	0.2	3.8	1.0
18 - Cocoa and cocoa preparations	0.2	0.0	3.7	0.9
7 - Edible vegetables, certain roots, tubers	1.7	0.6	3.7	1.3
<b>Total Share in Exports of Montenegro</b>		<b>69.5</b>		<b>39.3</b>

<b>Croatia</b>				
<b>Industry</b>	<b>2006</b>		<b>2013</b>	
	<b>BI</b>	<b>Share</b>	<b>BI</b>	<b>Share</b>
93 - Arms and ammunition	4.9	0.3	18.9	1.1
44 - Wood and articles of wood	4.5	4.0	8.0	5.6
31 - Fertilisers	6.6	1.6	7.1	2.4
25 - Salt, sulphur, earths and stone	7.8	1.9	7.0	1.7
21 - Miscellaneous edible preparations	5.2	1.5	4.5	1.5
1 - Live animals	0.4	0.0	4.1	0.5
89 - Ships, boats and floating structures	15.6	11.4	3.6	2.8
41 - Raw hides and skins and leather	3.8	0.9	3.5	0.7
68 - Articles of stone, plaster, cement	2.0	0.6	3.3	0.9
76 - Aluminum and articles thereof	2.5	2.8	3.2	2.7
<b>Total Share in Exports of Croatia</b>		<b>25.1</b>		<b>19.9</b>

<b>Macedonia</b>				
<b>Industry</b>	<b>2006</b>		<b>2013</b>	
	<b>BI</b>	<b>Share</b>	<b>BI</b>	<b>Share</b>
24 - Tobacco and manufactured tobacco substitutes	20.7	4.7	18.7	4.3
38 - Miscellaneous chemical products	0.2	0.2	14.9	15.1
62 - Articles of apparel, not knitted	13.7	18.0	10.7	11.5
72 - Iron and steel	9.4	25.2	7.7	16.5
7 - Edible vegetables, certain roots, tubers	6.8	2.2	4.8	1.7
19 - Preparations of cereals, flour	2.8	0.8	4.0	1.4
25 - Salt, sulphur, earths and stone	7.9	1.9	3.9	0.9
20 - Preparations of vegetables, fruit, nuts	3.2	1.0	3.4	1.2
22 - Beverages, spirits and vinegar	5.9	3.4	3.4	2.1
26 - Ores, slag and ash	1.7	1.3	3.3	4.2
<b>Total Share in Exports of Macedonia</b>		<b>58.6</b>		<b>58.9</b>

<b>Serbia</b>				
<b>Industry</b>	<b>2006</b>		<b>2013</b>	
	<b>BI</b>	<b>Share</b>	<b>BI</b>	<b>Share</b>
93 - Arms and ammunition	10.8	0.7	8.1	0.5
8 - Edible fruit and nuts	7.0	3.1	6.2	3.3
11 - Products of the milling industry	7.0	0.5	5.5	0.6
10 - Cereals	7.2	3.0	4.9	3.3
17 - Sugars and sugar confectionery	10.6	2.6	4.9	1.3
36 - Explosives	3.9	0.1	4.1	0.1
74 - Copper and articles thereof	6.0	6.7	3.6	3.1
76 - Aluminum and articles thereof	3.6	4.2	3.2	2.7
24 - Tobacco and manufactured tobacco substitutes	0.9	0.2	3.2	0.7
40 - Rubber and articles thereof	4.4	4.3	3.0	3.4
<b>Total Share in Exports of Serbia</b>		<b>25.3</b>		<b>19.0</b>

Industry	2006		2013	
	BI	Share	BI	Share
76 - Aluminum and articles thereof	4.3	4.9	4.3	3.6
44 - Wood and articles of wood	2.6	2.4	4.1	2.9
30 - Pharmaceutical products	2.8	6.9	4.0	10.6
32 - Tanning or dyeing extracts	3.1	1.5	3.7	1.6
54 - Man-made filaments	2.7	0.9	3.6	0.9
68 - Articles of stone, plaster, cement	3.2	0.9	3.3	0.9
56 - Wadding, felt and nonwovens	3.0	0.4	3.2	0.4
82 - Tools, implements, cutlery, spoons	3.1	1.1	2.6	0.9
83 - Miscellaneous articles of base metal	2.6	1.0	2.6	0.9
94 - Furniture	5.2	6.0	2.6	3.2
<b>Total Share in Exports of Slovenia</b>		<b>26.0</b>		<b>26.0</b>

Source: Authors on the basis of data from WITS, Trade Outcome Indicators

## Komparativna analiza konkurentnosti izvoza zemalja bivše Jugoslavije

**REZIME** – Rad se bavi analizom izvoznih performansi zemalja bivše Jugoslavije (Bosna i Hercegovina, Crna Gora, Hrvatska, Makedonija, Slovenija i Srbija) u periodu 2006-2013. godine. Cilj rada je ocjena izvozne konkurentnosti navedenih zemalja i utvrđivanje njene dinamike u robnoj razmjeni sa svijetom. Analiza je obuhvatila istraživanje i upoređivanje karakteristika izvoza – obima i dinamike izvoznih tokova, geografske i proizvodne strukture i koncentracije izvoza, tehnološke sofisticiranosti izvoza, izvozne specijalizacije izražene otkrivenim komparativnim prednostima, intenziteta i smjera promjene u izvoznoj strukturi. U cilju potpunijeg sagledavanja izvozne konkurentnosti korišteno je više indikatora: Balassina RCA indeks, Michaelyjev indeks, Herfindahl-Hirschmanovi indeksi koncentracije i dr. Indeksi su računati na podacima relevantnih baza Svjetske banke i Međunarodnog trgovinskog centra, agregiranim na drugoj i šestoj razini HS2002, za osmogodišnji period ili za prvu i posljednju godinu.

Istraživanje je pokazalo da su izvozne performanse ex-Yu zemalja općenito nezadovoljavajuće, uprkos napretku koji su pojedine od njih ostvarile u posmatranom periodu. Većina zemalja ima komparativne prednosti u proizvodima tradicionalnih, opadajućih industrija, visok udio poluproizvoda i primarnih proizvoda, a zanemario udio visokotehnoloških proizvoda u svom izvoznom portfoliju, stagnantnu izvoznu strukturu, te nizak stepen geografske i proizvodne diverzifikacije izvoza. Međusobno poređenje pokazalo je da grupa nije homogena, te da, pored navedenih zajedničkih karakteristika, unutar grupe postoje i značajne razlike u pojedinim aspektima izvozne konkurentnosti. Članice EU – Hrvatska i posebno Slovenija – imaju niz prednosti u odnosu na zemlje u statusu kandidata i potencijalnog kandidata. Najveći napredak u pravcu poboljšanja izvozne konkurentnosti ostvarila je Srbija, dok je ocjena izvozne konkurentnosti za Crnu Goru najnepovoljnija.

**KLJUČNE REČI:** zemlje bivše Jugoslavije, izvozna konkurentnost, izvozna struktura, otkrivene komparativne prednosti (RCA), izvozna diverzifikacija, izvozna koncentracija

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