RELEVANT FACTORS FOR BUILDING COMPETITIVENESS OF MANUFACTURING INDUSTRY IN BOSNIA AND HERZEGOVINA

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Abstract

Competitiveness of an industry is conditioned by a number of different factors. These factors may be a part of macroeconomic or microeconomic competitiveness. In essence, macroeconomic competitiveness creates preconditions for generation of microeconomic competitiveness. It is therefore important to identify relevant factors for generation of industry competitiveness in order to promote the microeconomic competitiveness of an industry through adequate macroeconomic competitiveness and industrial policy. In often cases, the government creates industrial policies to encourage development of a particular industry, but these policies do not have targeted effects. By identifying relevant factors of industrial competitiveness, industrial policy will be focused on them, thus avoiding waste of scarce resources and facilitating achievement of industrial policy objectives. This paper examines relevant factors of competitiveness of Bosnia and Herzegovina's (BiH) manufacturing industry in the period 2010-2017 as basis for its successful long-term growth and development. These factors should be a focal point of industrial policy makers in BiH manufacturing industry.

Keywords: competitiveness, relevant factors of competitiveness, manufacturing industry, export competitiveness

JEL: L52, L60

1. Introduction

Manufacturing is one of the most important sectors of economy. It is the largest exporter, a carrier of a country's economic activity and generally the most competitive sector. Its development and growth are conditioned, among other things, by ability to place products on international markets. In order to do this, businesses must offer products that are competitive with competing products in markets in which they emerge.

Competitiveness of manufacturing industry is influenced by a number of factors. The task of industrial policy makers is to identify relevant factors for building competitiveness of BiH manufacturing industry and to devise adequate industrial policies that will enable these factors to be built and strengthened.

Industries that have a built-in competitive advantage grow faster, generate more revenue, adequately manage costs, and create basis for investment and innovation that will enable them to survive and further expand in competitive markets. It is a constant pursuit of excellence and the role of the state to support these processes through an adequate industrial policy.

The process of de-industrialization has engulfed the whole world, but in BiH this process is much more complex. It is a consequence of devastation during the war and post-war transition that has resulted in the devastation of industrial complexes and their capacities. Following these processes, BiH industry needs adequate support to become competitive in international markets.

The aim of this paper is to identify and describe relevant factors for generating competitiveness of the manufacturing industry in BiH in the period of 2010-2017[1]. The central research question is: Which factors of competitiveness are relevant for generating competitiveness of

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BiH manufacturing industry? In order to answer the central research question using the panel regression method, the following central hypothesis was tested: Individual competitiveness factors, as a part of a complex concept of industry competitiveness, have an impact on building competitiveness of BiH manufacturing industry.

The first part of the paper defines the concept and factors of competitiveness of the country and industry and provides literature review. The second part describes the research methodology, sample, variables, sets and tests the model. The third part analyzes the results of the research on the impact of individual competitiveness factors on competitiveness of BiH manufacturing industry.

2. Theoretical framework and literature review

2.1. Review of previous research

When it comes to research on BiH manufacturing industry and its competitiveness, it can be concluded that this topic is still underresearched. Much more research has been done in Republic of Croatia and Republic of Serbia.

Vukšić (2005) investigated the impact of Foreign Direct Investments (FDI) on exports of Croatian manufacturing industry. He concluded that the impact of FDI on exports of Croatian manufacturing industry is relatively weak.

Džafić and Terzić (2007) investigated competetiveness of BiH economy in the function of European integration. They concluded that strategic positioning within European Union (EU) internal market is important for future prosperity and membership of the EU. They emphasized the importance of foreign direct investments, high-tech processes and creation of recognizable "brands".

Halilbašić and Brkić (2017) explored export specialization of Southeast European countries in trade with the EU before and after the start of trade liberalization, initiated by the conclusion of the Stabilization and Association Agreement. Using the Michaely Index, they found that high export specialization is still in primary industry products and resource-based products, low technology products and skills. The key failure of these countries is their poor performance in the production of goods based on research and innovation. Using the Balassa Revealed comparative advantage Index (RCA) of Open Comparative Advantages, they found that concentration level of exported products has decreased while exports to the EU are still highly concentrated on a small group of products.

Branković (2015) analyzed export competitiveness of the economy of Republic of Serbia using the Revealed comparative advantage Index (RCA). She concluded that long-term structure of Serbia's export competitiveness is unfavorable, given that the sections in which Serbia traditionally has comparative advantages primarily include resource and labor-intensive activities.

Filipović, Nikolić, and Ilić (2015) examined whether Serbian economy lagged behind in terms of competitiveness and speed of development of a knowledge-based economy relative to most highly developed European countries and selected countries in the region.

They pointed to the most important factors for development of a knowledge-based economy in Serbia, and the need to enhance opportunities for significant development of high-tech and knowledge-based activities as basis for future competitiveness of the domestic economy.

Teodorović and Buturac (2006) analyzed the perspectives of development of industrial production in Croatia. In the comparative advantage analysis, Revealed Comparative Advantages (RCA) indicators are used, the entropy index for the purpose of dispersion and concentration analysis and the GL (Grubel-Lloyd) index for the analysis of specialization in intra-industrial exchange.

They concluded that there has been a loss of comparative advantage in most industrial sectors and a decline in specialization in intra-industrial exchange. Stronger development of industrial production can be ensured by acting

on key factors of productivity and competitiveness.

Bogović and Peteh (2007) analyzed the importance of innovation policy for increasing competitiveness of Croatian manufacturing industry.

They concluded that one of the key causes of poor competitiveness of Croatian manufacturing industry is the lack of innovation and innovation capacity of Croatian companies. They proposed implementation of the EU innovation policy known as the new horizontal policy that integrates elements of scientific, technological and industrial policy.

Bakarić and Vizek (2010) analyzed structural characteristics and dynamics of production activity and production factors in manufacturing industry of Republic of Croatia from 1997 to 2007.

The results of this analysis showed that the structure of manufacturing industry of Republic of Croatia was declining and increasingly lagging behind European manufacturing industry, which ultimately means that it was losing competitiveness. The weakening of competitiveness of Croatian manufacturing industry is a result of the unfavorable technological structure, namely dominance and strengthening of low technological intensity industries.

Bezić, Cerović and Galović (2011) analyzed the position and determined competitive advantages of Croatian manufacturing industry in international trade, using the Revealed Comparative Advantage Index (RCA) as a method of determining the comparative advantage of exports, the Export Competitiveness Index (XC), as a method of measuring the export competitiveness of the observed countries, the Export Specialization Index (ES), as a method of comparing the export activity of manufacturing industry of Republic of Croatia and EU, and the Relative Trade Preference Index (RTA), which integrates the RCA and Relative advantages of import (RMA) indices.

They concluded that in order to improve competitiveness of Croatian manufacturing industry exports, the following are necessary: stronger integration and complementarity of economic policy (monetary and fiscal) in order to achieve a better competitive position of Croatian manufacturing industry, revision of plans and business strategies of companies in the manufacturing industry, creation of an attractive environment for investors and technology transfer of foreign investors, and cluster formation.

Tkalec and Vizek (2011), by using multiple regression, examined the impact of macroeconomic policies on Croatian manufacturing industry. They concluded that fiscal policy is particularly important for manufacturing industry because of the size of its fiscal elasticity and the short run of action.

Basarac and Vučković (2012) identified sectors of Croatian manufacturing industry and their growth potential by increasing their absolute and relative share of world market. A competitiveness analysis was performed based on the index of trade efficiency of Croatian manufacturing industry. The results of this analysis showed that the offer of Croatian manufacturing industry is dominated by traditional, labor and raw material intensive sectors with low technological intensity.

Stojčić (2012) investigated competitive-ness of exporters of Croatian manufacturing industry using the GMM (Generalized Method of Moments) system dynamic panel method. The survey results were consistent with theoretical predictions about the behavior of price-competitive firms.

In building their international competitiveness, Croatian exporters mainly rely on cost reductions and improved labor productivity. The sensitivity of these companies to wage increases implies that labor costs are an important determinant of their success in the international market. In overcoming barriers to exports, analyzed companies rely on their own resources, previous experience, sharing of costs, and knowledge through agglomeration externalities.

Since price competitiveness based on price factors is not a long-term source of competitive advantage, techno-logical transfer is necessary

in order for the manufacturing industry to survive and prosper; economic policy, strategic alliances and intra-industrial exchange play an important role in this process through which the technological structure of Croatian exporters can be improved.

2.2. Competitiveness of the country and industry

The term competitiveness does not have an unambiguous definition. Competitiveness can be observed at the level of state, sector, and company, and is a very complex term. The Organisation for Economic Cooperation and Development (OECD) defines competitiveness as a measure of a country's ability or inability to sell its products in the international market (OECD, 2017).

The OECD Secretariat calculates two different competitiveness measures based on the difference between domestic and competitive labor costs per unit of production and product sales price (OECD, 2017).

From the above definition, it can be clearly concluded that competitiveness of national economy is conditioned by competitiveness of its enterprises, especially those that export their products to inter-national markets.

On the other hand, competitiveness of an enterprise is determined by the ability to produce a product that will be more competitive than that offered by the competition. In order for businesses to be successful in this, in addition to the internal resources, they need to have a stable and supportive business environment. This means that competitiveness of a country's economy depends directly on competitiveness of its enterprises and vice versa.

National environment plays a central role in competitive advantage of enterprises and some national economies are more stimulating than others.

In Porter's view, the state should create conditions for the production factors to be invested in activities with the highest productivity of labor. Increasing productivity of enterprises is necessary in order to increase competitiveness of the national economy (see more on this: Porter, 1990, p. 79; Porter, 2002, p. 31).

Krugman (1994) in his article argued that competitiveness is an insignificant term when applied to the national economy. He believed that competitiveness is a more interesting way to express the term productivity and that it has nothing to do with international trade. In his work he focused on the US economy, which is characterized by a much larger domestic market relative to exports. US companies place most of their production on the domestic market, in order from the business environment point of view, they are all in an equal position.

In such economies, export competitiveness is a much less important issue of economic strategy instead of productivity, which is much more important. He also believed that states should not compete in the way businesses do because they rely on their power and have much more benefit from the success of others.

Competitiveness for him is a term used to implement unpopular policies such as financial deregulation, diminishing workers' rights, etc. Insisting on a country's competitiveness can also lead to trade wars and protectionism which can be detrimental. Many of these claims have been criticized by various authors who cite the example of the EU, which particularly emphasizes competitiveness of national economies where many member states such as Greece have many problems because their economies are not at the level of other member states such as Germany.

According to the Global Competitiveness Index (GCI), BiH ranks 92nd out of 141 countries.

The GCI measures competitiveness of a country using 12 pillars that are classified into four sub-indexes: supportive environment (institutions, infrastructure, information and communication technologies, macroeconomic stability), human capital (higher education and training, health) markets (goods market, labor market, financial system, market size), and innovation (innovation capability, business dynamism).

If we look at the first sub index, we will see that in the first pillar institutions, the institutional environment of a country is the worst rated and ranks 114th out of 141 countries. On the other hand, if we take a look at the factors that make it more difficult for an enterprise to operate, government inefficiency comes first; where we rank 139th out of 141 (World Economic Forum, 2019).

In addition to the GCI that measures a country's competitiveness, the Global Manufacturing Competitiveness Index (GMCI) measures the global competitiveness of production. According to this index, there are 12 factors of production competitiveness and the first four are key factors (Delloitte, 2016).

The first and most important factor is talent. Cost competitiveness comes second, productivity is ranked third and supplier network fourth. The legal framework is fifth, education and training are positioned sixth, infrastructure is seventh, economic, trade, financial and tax system are in the eighth place, the ninth is innovation, the tenth is energy policy, the eleventh is the attractiveness of the domestic market and the twelfth is the health system.

According to the 2016 Global Production Competitiveness Report, CEOs in USA, China, and Europe emphasize that their countries are increasingly working to create policies that support the construction of key factors for manufacturing competitiveness.

According to this report, the key barriers to increasing competitiveness of production in these three leading economies of the world are labor costs, legislation, tax rates and fiscal policy (Delloitte, 2016).

According to Harvard Business School (2018), competitiveness is determined by microeconomic competitiveness and macroeconomic competitiveness.

Microeconomic competitive-ness is determined by the quality of business environment, degree of cluster development, sophistication of business processes, and enterprise strategies. Macroeconomic competitiveness is deter-mined by stimulating monetary and fiscal policies, effective political institutions, and human resource development. Macroeconomic competitiveness creates conditions for high productivity and development of microeconomic competitiveness.

Numerous economic theorists have addressed the problem of competition and competitive advantage of firms, most notably within the theory of the firm. Some of the most significant approaches are: neoclassical model of perfect competition, school of industrial organization, Schumpeter's theory, Chicago school, and transaction cost theory (Daraboš, 2015, p. 16).

Table 1 gives an overview of defining the concept of competitive advantage through schools of economic thought.

Table 1. *Competitive advantage through schools of economic thought*

Approach	*Key features*	*The most important representatives*
Neoclassical model	• Is based on a simplified model of perfect competition • The following assumptions apply: (a) it is easy to determine the optimal input ratio (b) the marginal contribution of each input can be calculated (c) all businesses have complete and accurate information, (d) resources are fully mobile and shared • By combining inputs in an optimal ratio, companies produce the final output • The behavior of the company is completely determined by market prices and marginal costs	Alchain (1982), Alchain & Demsetz (1972) Edgeworth (1881) Stigler (1957) McNulty(1968)
School of Industrial Organization	•Competitive advantage is achieved by limiting production, using monopoly power or negotiating with competitors • Companies seek to restrict production in order to cause price increases •Industries where most output is produced by a few businesses can provide above-average profits in the long run • Much attention is paid to the size of the enterprise, assuming that larger enterprises control most of the industrial outputs and thus have a greater impetus for so-called monopolization of the industry, ie agreement with competitors • These assumptions open up the theoretical possibility of separating certain companies from the successful group of average and do not exclude the possibility of possessing some specific characteristics that certain businesses can provide long-term profitability at a level higher than the industry average. Therefore, the concept includes competitiveness theories enterprise heterogeneity, which implies the inherent ability of an enterprise to generate returns	Bain (1948, 1950, 1951, 1954), Scherer (1980), Tirole (1989), Gale (1972), Mann (1966), Hall & Weiss (1967), Shepherd (1972)
Schumpeter's theory	•Competition as a contest to create and apply innovation • The focus is on the dynamism of competition while criticizing the static view of pricing products and processes that do not change • Competitive advantage is achieved through innovation that distorts competitors' market position	Schumpeter (1950), Mason (1951,1957a) Cohen & Levin (1989), Markham (1975), Scherer (1980), Nelson & Winter (1982)
Chicago School	•By applying neoclassical price theory and weakening certain assumptions of perfect competition it opposes the thesis of monopolizing the market as a source of competitive advantage • Competitive advantage is explained by efficient production and distribution, ie internal efficiency of the company • The size and the volume of the business of a company are determined by its efficiency, in which the growth of the company is based on efficiency achieved • The state should remove all barriers to profit	Kitch (1983), Stigler (1951, 1961, 1964, 1968c, 1968a, 1986b), Nelson (1974), Demsetz (1968, 1975), McGee (1975)
Transaction cost theory	• Aimed at defining the optimal size of a business through consideration of the relationships between market transaction costs and costs managing internal transfers • The enterprise will tend to grow until the cost of organizing a market transaction equals the cost of implementing those same transactions	Coase (1937, 1952), Williamson (1972, 1975, 1983, 1989), Klein, Crawford & Alchian (1978), Ouchi (1980), Walker & Weber (1984, 1987), Klein & Leffler (1981)

Source: Adapted from (Daraboš, 2015, pp. 17-18)

In this paper, we define competitiveness of an enterprise or industry as its ability to offer a product that is more competitive than products offered by the competition. This means that the company has to offer a product that will have a higher value for the customer than its competitor, at a price equal to or lower than offered by its competitor. Competitiveness of an industry is determined by competitiveness of its enterprises. This ability can be viewed and evaluated from multiple perspectives, such as: value of investments, exports, innovation, profitability, and number of employees. They interact together to increase competitiveness of the enterprise, industry and its fields.

The following factors of competitiveness were considered in the analysis of the key factors for building competitiveness of BiH manufacturing industry: investments, innovation, productivity, profitability, and their impact on competitiveness of the manufacturing industry, measured by the value of exports and competitiveness index representing the ratio of exports and total sales revenue (see more on this: Stojčić, 2012, p. 5).

2.3. Industrial policy and competitiveness

There are significant differences among the authors who worked on defining industrial policy. Adams and Klain defined industrial policy as a set of different measures, policies, and programs that foster industry competitiveness. Grant defined industrial policy as a set of measures used by governments to influence investments decisions in companies to reduce unemployment, improve the balance of payments and create a more efficient industrial economy in general. For the OECD, industrial policy is the focus on a set of goals related to industry activities and its development. Ohlin and Hesselborn under industrial policy implied all legal, fiscal and financial frameworks of a business (Savić, 2010, p. 130).

Industrial policy, its meaning and role in the economy have changed and evolved over time. Since after the depression 1929-1933 up to the early 1980s, industrial policy was part of state intervention in the economy with the goal of regulating the market and eliminating market externalities. With the development and strengthening of liberal economic thought in the 1980s and 1990s, the number of opponents of industrial policy increased. However, in many cases, it has shown that the market itself is not a good enough regulator, since it is driven by profit. One example are investments in research and development (R&D). The environment can often benefit more from the research so that business profits do not always have to cover the costs incurred. At the same time, a company cannot predict future behavior of participants in its production "chain." The modern market does not always provide complete information on what to produce and requires the intervention of public authorities to remedy this major market failure (Savić, 2010, p. 134).

As a result of the mortgage market collapse, liberal governments around the world faced a global economic crisis in 2007. This crisis affected the real sector and sampled the global recession in 2009. The crisis resulted in an increase in unemployment, decline in living standards, environmental pollution, and decrease and disappearance of natural resources.

The solutions to these problems were sought precisely in industrial policy measures.

Most economists do not believe that the active role of governments in promoting economic growth and industrialization produces good results because past experience showed that such policies are often very expensive and do not meet most of the set objectives (Lutovac, 2014, p. 74). However; the most common cause for such an outcome of industrial policy measures lies in the fact that they were not properly targeted and implemented. This means that government's policy of promoting and diversifying industries must be based on industries that have some potential comparative advantage, to enable emerging industries to become competitive in domestic and international markets soon (Lutovac, 2014, p. 74).

The key to industrial policy success lies primarily in identifying industries that ha-ve the potential to build competitive adva-ntage and then, through appropriate industrial policy

measures, influence the construction and maintenance of competitive advantage. One of the preconditions for the success of industrial policy measures is certainly the way of approach, i.e. whether it is an ex-post or ex-ante approach. With the ex-ante approach, the state regulates market movements, while with the ex-post approach the state intervenes only when the problem arises. Due to the neglect of importance of industrial policy and ex-post approaches, the EU has faced a number of problems such as falling productivity, rising unemployment, and losing competitiveness over its two leading competitors, Japan and the United States. This is why the European Commission has proposed a Europe 2020 strategy to increase competitiveness of the EU. The first of the seven pillars of this strategy is the industrial policy for the globalization era, aimed at improving the business environment, especially for SMEs and supporting the development of a strong and sustainable industrial base capable of competing globally (World Economic Forum, 2014).

3. Methodology

3.1. Research sample

Manufacturing is one of the most impor-tant sectors of an economy. It is an industry branch that deals with the processing of materials and substances of plant and animal origin into finished products. The end products of this industry may be fnished products for sale to customers or intermediate goods used further in production processes. It is the basis for the development of every country, especially developing countries, it enables import substitution and export expansion.

According to the BiH Business Classification 2010 (Sections of Standard Industrial classification (KD) BiH, 2010), manufacturing industry comprises 23 sections. It is the largest exporter, the carrier of country's economic activity and generally the most competitive sector. Its development and growth among other things are conditioned by the ability to place products on international markets.

In order to do this, the businesses must offer products that are competitive with competing products in the markets in which they appear.

According to the BiH Industry Classification 2010, there are 15 fields of activity, namely: B-mining and quarrying, C-manufacturing, D-production and supply of electricity, steam, gas, E-water supply, F-construction, G-commerce wholesale and retail, H-transportation and storage, I-catering, J-information and communications, K-financial activities, L-real estate business, M-professional, scientific and technical activities, N-administrative activities, O-public administration, P-education, Q-health care activities, R-arts, entertainment, S-other service activities, T-activities of households, U-activities of extrateritorial organizations.

The total number of registered companies in BiH as of June 30, 2018 was 37,587 (The Agency for Statistics of Bosnia and Herzegovina - BHAS, 2018), out of which 4,957 were enterprises in the manufacturing industry or 13.18%.

As shown in Figure 1, according to the latest published data of enterprises in BiH, 28.3% of them are in the section G (wholesale and retail trade; repair of motor vehicles and motorcycles), the BHAS (2018) out of the total number of 13.5% in C (manufacturing), 8.6% in M (professional, scientific and technical activities), 7.8% in S (other service activities), 5.9% in F (construction) and 5.7% in H (transportation and storage).

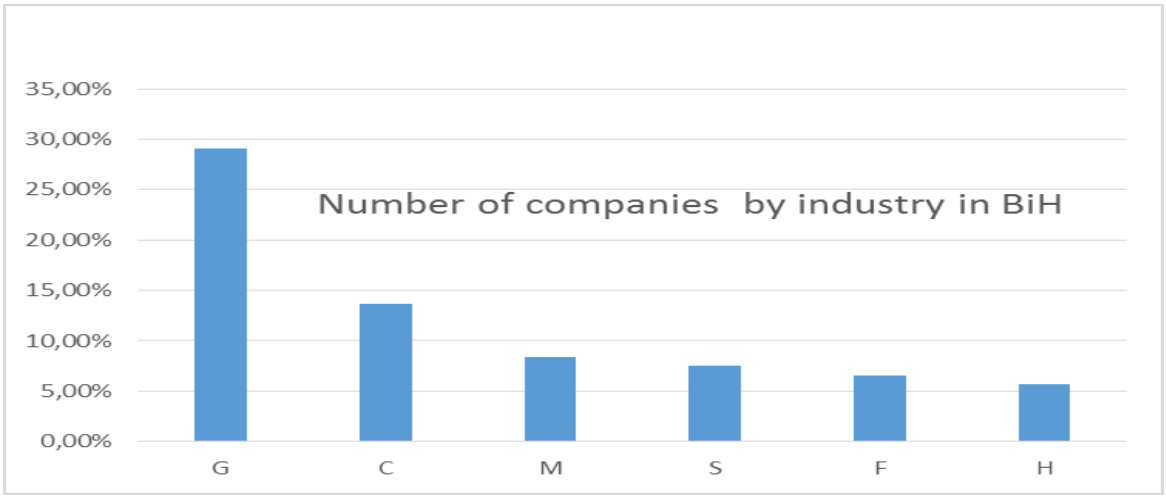

Figure 1. *Participation of enterprises in the total number of enterprises in BiH by industry*

Source: Agency for Statistics of Bosnia and Herzegovina, 2017

Figure 2 shows the total number of employees in BiH in 2017, as well as the sections with the highest number of employees. According to the BHAS, in 2017, out of 556,175 BiH employees, 209,674 or 37.7% worked in B, C, D and E, 159,871 or 28.74% in manufacturing, and 145,349 or 26.13% in the section G-wholesale and Retail. The above data point to the conclusion about the importance of manufacturing industry in solving one of the key problems of BiH economy, namely high unemployment rate.

Figure 3 shows the structure of the economy and manufacturing industry in BiH by the size of enterprises. The criterion for determining company size is the number of employees as follows: Small (0 to 49 employees), Medium (50 to 249 employees), and Large (250 and more employees).

The total number of enterprises in BiH in 2017 was 27,379. Out of this number, small businesses make up 25,877 or 94.51% and 4,175 or 16.14% belong to the manufacturing industry. There are 1,259 or 4.6% of medium enterprises in the total number of enterprises in BiH, out of which 472 or 37.49% belong to the manufacturing industry. There are 243 large enterprises in the total number of enterprises in BiH, out of which 113 or 46.5% belong to the manufacturing industry (Authors' calculations according to the data of the BHAS 2018).

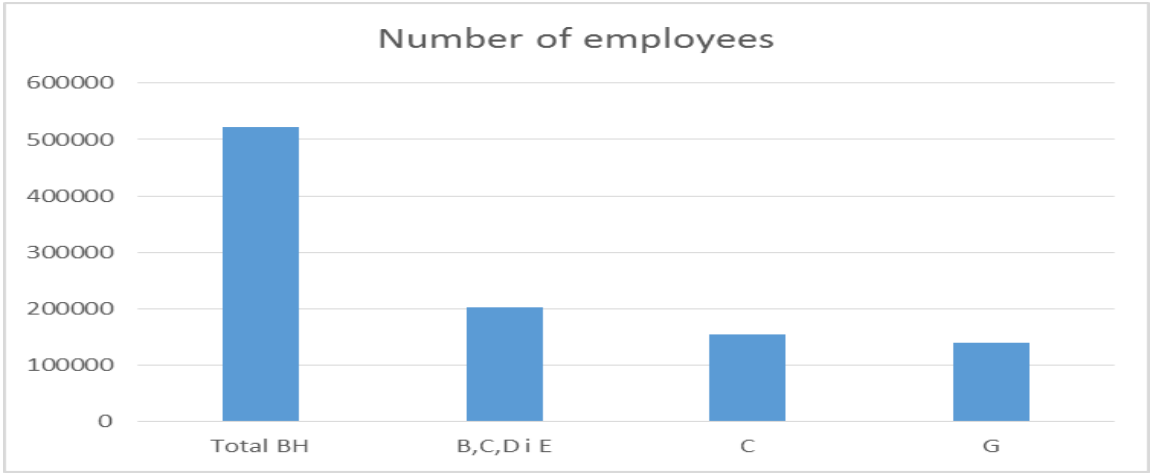

Figure 2 *Number of employees in BiH by industry*

Source: Agency for Statistics of Bosnia and Herzegovina, 2017

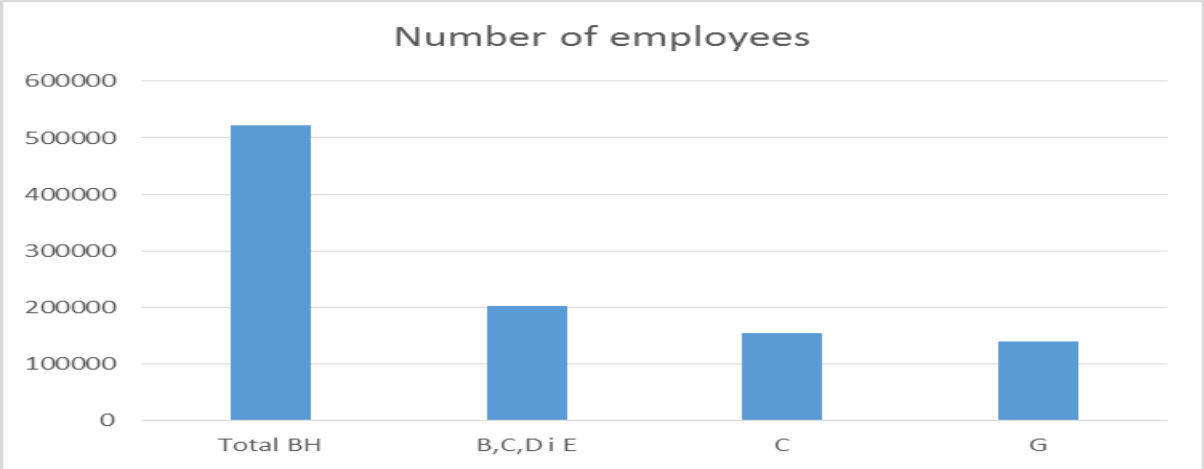

Figure 3. *Structure of BiH economy and manufacturing industry by size of enterprise*

Source: Agency for Statistics of Bosnia and Herzegovina, 2017

Figure 4 gives an overview of the structure of the economy and manufacturing industry in BiH by the amount of the realized turnover.

The total turnover of companies in BiH in 2017 amounted to BAM 68,932,418 the turnover of manufacturing industry amounted to BAM 16,779,855 or 24.34%.

In the total turnover of manufacturing industry, small enterprises account for BAM 5,140,528 or 30.63%, medium BAM 5,737,793 or 34.19%, and large BAM 5,901,535 or 35.17%.

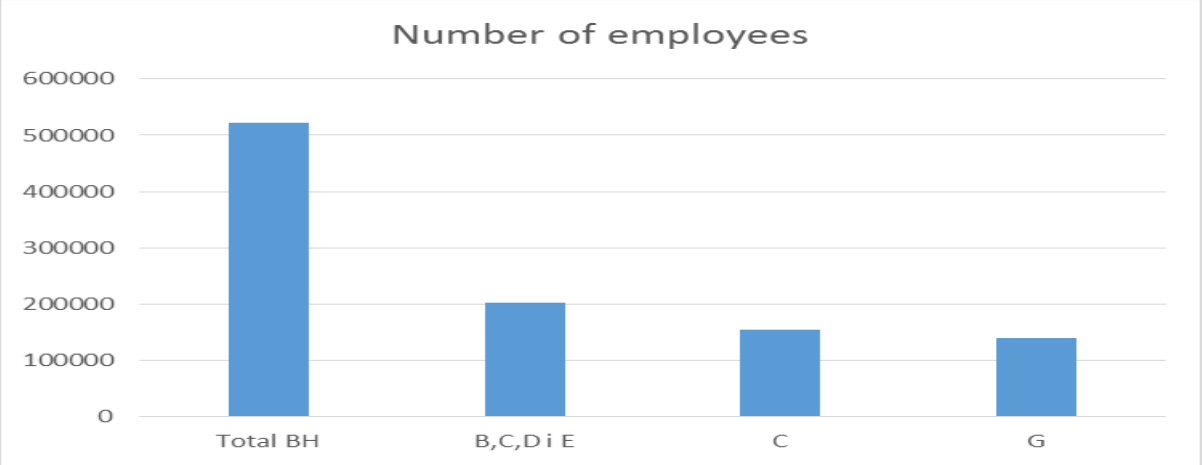

Figure 4. *Structure of BiH economy and manufacturing industry by income*

Source: Agency for Statistics of Bosnia and Herzegovina, 2017

This analysis points out the conclusion that after trade, manufacturing is the most important industry in BiH and carrier of economic growth and development. It is the industry that has the greatest potential to be the carrier of competitiveness of economy.

4. Data and models

To determine the impact of individual competitiveness factors on competitiveness of BiH manufacturing industry, that is, which factors are relevant to competitiveness of BiH manufacturing industry, regression panel models were used. Secondary factual data were collected from the BHAS database.

The sample is the manufacturing industry during the period 2010-2017. Given that the sample is the manufacturing industry with 23 sections and an observation period of eight years, we have 184 observations suggesting use of regression panel models.

In this paper, competitiveness of manufacturing industry is viewed primarily from the aspect of micro-competitiveness, *i.e.* how macro-competitiveness can help to build micro-competitiveness.

Given the limitations in the availability of data, the analysis of the individual competitiveness factors of BiH manufacturing industry was made for the period 2010-2017.

4.1. Individual factors of competitiveness of BiH manufacturing industry

4.1.1. Investments

FDI plays an important role in the economies of developing countries that have insufficient capital accumulation. Given that BiH economy is characterized by a low level of development, capital inflows through FDI can be a strong impetus for industry development. However; in order to realize investments, it is necessary to take very sophisticated industrial policy measures, which means that one always has to be one step ahead of competing countries Savić 2010, p. 95). The situation in the field of FDI in BiH is best illustrated by the fact that in 2018 they amounted to 2.5% of GDP, while in Croatia they amounted to 2.1%, in Serbia to 8.1%, in Montenegro to 8.9% and in Macedonia to 5.3% (The World Bank, 2018). When a foreign investor invests capital, one of the primary factors he/she takes into consideration is the stability of the business environment that allows him/her to plan investments. Frequent changes of regulations make planning and investments decisions difficult (Blanchard & Perotti, 2002, p. 1330). Namely, out of precaution, companies can delay investments or abandon them. In an uncertain environment, trust plays an important role. Consumption and investments depend, among other things, on the attitudes of individuals and businesses on the general economic environment (see more on this: Alihodžić & Altumbabić, 2017, p.

88) and their confidence is influenced by industrial policy.

4.1.2. Productivity

One of the key determinants of enterprise competitiveness is productivity. Increasing productivity means improving the way we pursue manufacturing activities through innovation. Innovation is one of the key factors for improving competitiveness of businesses. In order to reach them, it is necessary to invest in R&D. A key determinant, the driver of innovative activities is demand. (Aralica, Račić & Radić, 2008, p. 84) However; in order to adequately respond to demand requirements, a company must have sufficient accumulation of capital needed to carry out R&D activities. This is especially important for low-income countries, such as BiH, because without an increase in productivity and thus competitiveness of production, there can be no increase in income.

Employee costs are a very important factor in building competitive advantage of a manufacturing company. Reducing employee costs and generating more turnover per employee leads to increased productivity and is particularly important for exporters in the manufacturing industry as it enables them to be competitive in price. Increasing productivity creates space for innovative activities, which in return, result in an increase in productivity. It is a process of constant pursuit of excellence as a basic prerequisite for entry and survival in competitive international markets.

Employee costs are the total compensation, in cash or in kind, paid by the employer to the employee (regular or temporary employees, as well as workers working at home) in exchange for work performed during the period under review. Employee costs also include taxes and social security contributions withheld by the unit, as well as mandatory and voluntary contributions at the expense of the employer. Included are rewards, additional awards, thirteenth pay (and similar supplementary awards), as well as payments made to employees in connection with layoffs, accommodation, transportation, living expenses, family allowances, commissions, on-call fees, overtime and night work, *etc*. Agency workers are not included in employee costs (BHAS, 2017).

Turnover includes accrued income from a sale of products, goods and services by the reporting unit to third parties during the reference period. Turnover includes all duties and taxes on goods and services invoiced by the unit with the exception of value added tax (VAT) and all taxes of that type (BHAS, 2017). Turnover per employee in the manufacturing industry is an indicator of productivity of the manufacturing industry in BiH.

4.1.3. Profitability

Another important factor in building competitiveness of the manufacturing industry is profitability. It forms the basis for investments and innovation activities. The profitability indicators of the manufacturing industry under consideration are factor costs value added and turnover. Factor costs value added represents gross operating income after adjusting for operating subsidies and indirect taxes. Factor costs value added is calculated from turnover, plus capitalized production, other operating income (including operating subsidies), plus or minus changes in inventories, minus supply of goods and services, other taxes on products that are related to turnover but not deductible, and customs duties and taxes related to production.

Customs duties and taxes on production are compulsory, non-refundable payments, whether in cash or in kind, imposed by the government, in connection with production and importation of goods and services, employment of labor, ownership or use of land, buildings or other property used in the production process, regardless of the quantity or value of the goods and services produced or sold (BHAS, 2017). This profitability indicator is significant for analysis because it demonstrates the ability of the manufacturing industry to effectively manage its costs.

4.1.4. Export and export intensity of BiH manufacturing industry

When it comes to measuring competitiveness of an industry, there are a variety of indicators, indices by which it is measured and evaluated.

Some of the most significant indices are the RCA Index and the RCA Balassa Index (Balassa 1965). In this paper, competitiveness of the manufacturing industry will be measured by the value of exports and competitiveness index, which represents the ratio of exports to total turnover, that is, an indicator of export intensity. The value of BiH export is low. This claim is best substantiated by the data that the share of exports in country's GDP in 2018 was 41.4% and in the neighboring countries as follows: Croatia 51.2%, Serbia 50.9%, Montenegro 42.2%, Macedonia 49.2 % (The World Bank, 2018). The processing industry share in GDP in 2017 was 15.39% and after trade the manufacturing industry had the largest share in GDP (BHAS, 2017). Manufacturing exports in 2017 accounted for 89.25% of the total BiH exports (BHAS, 2017).

4.2. Model

To determine the impact of individual competitiveness factors on competitiveness of BiH manufacturing industry, that is, which factors are relevant for generating competitiveness of BiH manufacturing industry, regression panel models were used. The following panel data models were set up:

Model 1:
$PreExport_{it}=\alpha+\beta_{it}$ ($INCOME_{it}$+ FCV_{it}+ NOE_{it}+ $PRODUKT_{it}$+$INVEST_{it}$) + ε_{it}

Model 2:
$PreIndex\%_{it}=\alpha+\beta_{it}$ ($INCOME_{it}$+ FCV_{it}+ NOE_{it}+ $PRODUKT_{it}$+$INVEST_{it}$) + ε_{it}

In Model 1, the dependent variable $PreExport_{it}$ represents the realized export of the manufacturing industry in the observed period, and the independent variables: $INCOME_{it}$realized income, FCV_{it} value added at factor cost. The NOE_{it} variable represents the number of employees, the PRODUKTit productivity of the manufacturing industry and INVESTit the realized investments in the manufacturing industry in the observed period.

In Model 2, the dependent variable PreIndex% represents the ratio of exports and income of the manufacturing industry, and the number and manner of expressing independent variables is the same as in Model 1.

The estimation of the influence of independent variables on the dependent variable was performed using standard models in panel regressions: ordinary least squares model, fixed effects model and stochastic effects models. The following tests were used to determine which model reflects the actual condition the best or which model is adequate: the F test to choose between ordinary least squares and fixed effects models, the Breusch-Pagan test to choose between ordinary least squares models and stochastic effects models and the Hausman test for choosing between fixed and stochastic effects models. After selecting the appropriate model, we used the Wooldridge test for testing autocorrelation in panel data and the White test for heteroskedasticity in panel data. By comparing the values of the coefficients of determination R^2 of Model 1 and 2, a choice was made between Model 1 and Model 2.

The following main hypothesis was tested: Individual competitiveness factors, as part of a complex concept of industry competitiveness, have an impact on building competitiveness of BiH manufacturing industry.

The following working hypotheses were tested:

H_1: Investments have a positive impact on building competitiveness of BiH manufacturing industry.
H_2: Productivity has a positive impact on building competitiveness of BiH manufacturing industry.
H_3: Profitability has a positive impact on building competitiveness of BiH manufacturing industry

Testing and analysis of set panel regression models would test the set hypotheses. Model testing was performed using STATA 13 statistical software.

5. Results and discussion

In Model 1, 55.03% of the variations in the dependent variable were explained by variations in the independent variable, while in Model 2, 0.3% of the variations in the dependent variable were explained by the variations in the independent variable.

Therefore, Model 1 was accepted as more adequate in this research.

The results of the Hausman test presented in Table 2 show that it is better to apply models with stochastic effects.

Table 2. *The results of the OLS regression analysis*

	Fixed	Random	Difference	S.E.
Income	.2471836	.2791873	.320036	.0186466
FCV	.6226045	.5563608	.0662437	.04255
NOE	3.32357	1.037153	2.286417	1.838018
Investments	-418.0294	-386.3034	-31.72603	38.16093
Productivity	586.3139	576.3214	9.992449	53.85712
chi 2 (5) = 5.79				
Prob>chi 2= 0.3268				

Source: Own research

Table 3 shows the results of the regression parameter estimation in Model 1.

Table 3. *Results of the panel model*

	RESULTS
Variables	Random
Income	0.279
	0.000
FCV	0.556
	0.001
NOE	1.037
	0.797
Investments	-386.300
	0.000
Productivity	576.321
	0.000
constant	38.815.990
	0.407
Observations	184.000
R-squared	0.550

Source: Own research

The value of R^2 is 0.55, which means that the high percentage of changes in competitiveness of BiH manufacturing industry is explained by the variables included in the model. Variable number of employees is not significant in the Random model. Contrary to the aforementioned application of the GMM method, Stojičić (2012) concludes that employee costs are a significant factor in competitiveness of Croatian manufacturing industry. The same conclusion is stated in the research of Stojičić, Bečić and Vojinić (2012). Other variables are significant at a significance level of 5%. The investments variable has a negative impact on competitiveness of BiH manufacturing industry, which means that an increase in investments by 1% on average reduces competitiveness of the manufacturing industry by 386.3%. In his research, Vukšić (2005) finds that foreign investments have a positive impact on the export of Croatian manufacturing industry, however; the level of this impact is low, and if the regression equation eliminates investments, the productivity impact on the export of Croatian manufacturing industry is increased. This is in line with the results of Škudar (2004). Investments in the manufacturing sector are mainly related to privatization and takeover of existing and still relatively successful enterprises without the need for major restructuring. Takeovers of businesses that need capital, technology and new organizational solutions are much less frequent and greenfield investments in the manufacturing sector are mostly reduced to smaller projects. Such a structure of direct investments has little impact on the development of the Croatian manufacturing sector.

Other variables have a positive impact on competitiveness of BiH manufacturing industry. Increase in turnover by 1% on average increases competitiveness by 0.279% while growth of Factor Costs Value Added (FCV) by

1% increases competitiveness by 0.556% on average, and it can be concluded that profitability is the factor that has a significant impact on building competitiveness of BiH manufacturing industry. Similar results were obtained by applying a static panel analysis by Škuflić, Družić and Mlinarić (2016).

Productivity growth of 1% on average in-creases competitiveness of the manufacturing industry by 576.321%. This result is in line with theoretical assumptions about productivity as the most significant factor in building competitiveness of BiH manufacturing industry. Similar results were obtained using GMM methods by Stojičić (2012) and using panel regression analysis by Vukšić (2005).

The estimated results of stochastic regression model parameters reject the hypothesis H_1 or confirm the alternative hypothesis that investments have a negative impact on competitiveness of BiH manufacturing industry and confirm the hypotheses H_2 and H_3 that factors of competitiveness productivity and profitability have a positive impact on competitiveness of BiH manufacturing industry in the observed period 2010-2017 at a significance level of 5%.

Confirmed influence of individual competitiveness factors on competitiveness of BiH manufacturing industry in working hypotheses confirms the main research hypothesis that individual competitiveness factors have an impact on competitiveness of BiH manufacturing industry in the period 2010-2017 at a significance level of 5%.

6. Conclusion

Increasing competitiveness of BiH manufacturing industry is *conditio sine qua non* of its development and survival, and thus the development of overall BiH economy. A strong and competitive manufacturing industry can be generator of the country's economic development. Given the destroyed industrial capacities, in the post-war period, instead of economic and industrial policies aimed at rebuilding and strengthening manufacturing industry, they went towards de-industrialization (decrease in industry's share of GDP). The consequences of entering this process prematurely are large and far reaching for the country's economy, including high unemployment, high foreign trade deficit, high indebtedness and high budget deficits.

The aim of this paper was to identify relevant factors for enhancing competitiveness of BiH manufacturing industry in order to make appropriate recommendations for the formulation of adequate industrial policies on the basis of obtained results. The statistical analysis concludes that profitability and productivity have a positive impact on competitiveness of BiH manufacturing industry, while investments have a negative impact on competitiveness of BiH manufacturing industry. According to the results of the analysis, investments in the manufacturing industry in BiH have a negative impact on competitiveness of the manufacturing industry. Reasons for this should be sought in the fact that the level of FDI is not high enough, that domestic investments are rising and that FDI very often did not result in the transfer of knowledge and technology by investors. The findings are in line with theoretical assumptions about building competitive advantage of BiH manufacturing industry based on cost leadership strategies. It is necessary to allow the appropriate industrial policies to further strengthen the stated competitiveness factors (profitability and productivity) which will create space for innovative manufacturing activities and a gradual transition from cost management strategies to differentiation strategies.

A significant limitation in analysis is certainly a short period of observation. In order to obtain a more complete picture of the state and trends of the individual factors of competitiveness and competitiveness of BiH manufacturing industry, the observation period should be longer, at least ten years.

References

1. Alihodžić, J. & Altumbabić, V. (2017). Interlokalni sukob Zakona s obzir na Zakon o finansijskom poslovanju privrenih subjekata u BiH: Osvrt na obaveze iz eurointegracijskog procesa. *Revija za pravo i ekonomiju.* 18(1), pp. 83-101.
2. Agency for statistics of Bosnia and Herzegovina. *Structural Business Statistics 2017*.

Available at: http://www.bhas.gov.ba/ data/Publikacije/Bilteni/2019/SBS_00_2017 _TB_0_BS.pdf (Accessed: April 17, 2018).
3. Agency for statistics of Bosnia and Herzegovina. *Gross Domestic Product by Production, Income and Expenditure Approach 2017*. Available at: http://bhas.gov.ba/data/Publikacije/Bilteni/2019/NAC_00_2017_Y1_0_BS.pdf (Accessed: October 07, 2019).
4. Agency for statistics of Bosnia and Herzegovina. *BiH Foreign trade in goods statistics 2017*. Available at: http://www.bhas.ba/saopstenja/2017/ETS_2016M12_001_01_bos.pdf (Accessed: October 07, 2019).
5. Aralica, Z., Račić, D. & Radić, D. (2008). Innovation Propensity in Croatian Enterprises: Results of a Community Innovation Survey. *South East European Journal of Economics and Business.* 3(1), pp. 77-88.
6. Bakarić, I. & Vizek, M. (2010). Analiza konkurentnosti i strukturnih obilježja prerađivačke industrije Republike Hrvatske. *Ekonomski pregled*. 61(5), pp. 241-270.
7. Balassa, B. (1965). Trade Liberalization and 'Revealed' Comparative Advantage, *The Manchester School*. 33. pp. 99-123.
8. Basarac, M. & Vučković, V. (2012). Analiza izvozne konkurentnosti hrvatske prerađivačke industrije. *Ekonomski pregled.* 61(12), pp. 729-751.
9. Bezić, H., Cerović, Lj. & Galović, T. (2011). Promjene u konkurentskim prednostima prerađivačke industrije Hrvatske. *Časopis za ekonomsku teoriju i praksu.* 29(2), pp. 465-487
10. Blanchard, O. & Perotti, R. (2002). An Empirical Characterization of Dynamic Effects of Changes in Government Spending and Taxes on Output. *The Quarterly Journal of Economics.* 117(34), pp. 1329-1368.
11. Bogović, N. & Peteh, B. (2007). Inovacijska politika u funkciji povećanja konkurentnosti prerađivačke industrije Republike Hrvatske. *Ekonomska istraživanja.* 20(2), pp. 76-85.
12. Branković, A. (2015). Izvozna konkurentnost privrede Republike Srbije pod uticajem tranzicionih promjena. In: *Strukturne promene u Srbiji – dosadašnji rezultati i perspektive* (pp. 48-64). Beograd: Institut ekonomskih nauka.
13. Buturac, G. & Teodorović, I. (2006). Perspektive industrijske proizvodnje u Hrvatskoj i intraindustrijska razmjena. *Ekonomski pregled.* 57(11), pp.705-728.
14. Buturac, G. (2008). Komparativne prednosti i izvozna konkuretnost hrvatske prerađivačke industrije. *Ekonomska istraživanja.* 21(2), pp. 47-59.
15. Central Bank of Bosnia and Herzegovina. *Direct foreign investment.* Available at: http://statistics.cbbh.ba/Panorama/novaview/SimpleLogin_en_html.aspx (Accessed: November 26, 2019).
16. Daraboš, M. (2015). *Evolucija konkurentske prednosti – U potrazi za uspjehom u hiperkonkurentskim uvjetima*. Zagreb: Naklada Ljevak.
17. Delloitte (2016). *Global Manufacturing Competitiveness Index*. Available at: https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Manufacturing/gx global-mfg-competitiveness-index-2016.pdf (Accessed: December 08, 2018).
18. Džafić, Z. & Terzić, L. (2011). Konkurentnost privrede Bosne i Hercegovine u funkciji evropskih integracija, In: Džafić, Z., Zahirović, S. & Umihanić, B. *(Eds.) Zbornik radova sa druge međunarodne naučne konferencije „Ekonomija integracija"- Izazovi i perspektive integracija zemalja Jugoistočne Europe* (pp. 55-66). Tuzla: Faculty of Economics.
19. Đorđević, M. & Lojanica, N. (2016). Uticaj makroekonomskog okruženja na nivo nacionalne konkurentnosti:Primer Republike Srbije. In: Markinković, V., Janjić, V. & Mićić, V. (*Eds.*) *Zbornik radova Unapređenje konkurentnosti Republike Srbije* (pp. 29-41). Kragujevac: Ekonomski fakultet Univerziteta u Kragujevcu.
20. Filipović, M., Nikolić, M. & Ilić, V. (2015). Razvoj privrede zasnovane na znanju kao faktor povećanja konkurentnosti privrede Srbije. *Ekonomske teme*. 53(2), pp.191-214.
21. Halilbašić, M. & Brkić, S. (2017). Izvozna specijalizacija zemalja Jugoistočne Europe u trgovini sa Europskom unijom. *Ekonomska revija.* 15(1), pp. 75-87.
22. Harvard Business School (2018). *Drivers of com-petitiveness.* Available at: https://www.isc.hbs.edu/competitiveness-economic-development/frameworks-and-key-concepts/Pages/drivers-of-competitiveness.aspx (Accessed: April 17, 2018).

23. Krugman, P. (1994). Konkurentnost-Opasna opsesija. *Foreign Affairs*. 73(2), pp. 28-44.
24. Lutovac, M. (2014). Industrijska politika Europske unije. *Ekonomske ideje i praksa.* 15, pp.73-79.
25. Porter, M. (1990). *The Competitive Advantage of Nations*. New York: Free Press.
26. Porter, M. (2004). Building the Microeconomic Foundations of Prosperity: Findings from the Business Competitiveness Index. *The global competitiveness report 2004,* pp. 29-72
27. Savić, Lj. (2010). *Ekonomika industrije*. Beograd: CID Ekonomski fakultet.
28. Stojčić, N. (2012). Konkurentnost izvoznika iz hrvatske prerađivačke industrije. *Ekonomski pregled.* 63(7), pp. 424-445.
29. Škudar, A. (2004). *Pregled i analiza izravnih ulaganja u Republiku Hrvatsku*. Zagreb: Hrvatska narodna banka.
30. Tkalec, M. & Vizek, M. (2009). The Impact of Macroeconomic Policies on Manufacturing Production in Croatia. *Privredna kretanja i ekonomska politika.* 19(121), pp. 61-93.
31. Vukšić, G. (2005). Utjecaj izravnih stranih ulaganja na izvoz hrvatske prerađivačke industrije. *Financiijska teorija i praksa.* 29(2), pp. 147-175.
32. Organisation for Economic Cooperation and Development (OECD). *Glossary of statistical terms* (Online). Available at: https://stats.oecd.org/glossary/detail.asp?ID=399 (Accessed: November 25, 2017).
33. Službeni glasnik BiH (2010). *Sections of Standard Industrial classification KD BiH 2010.* Available at: http:// sllist.ba/ glasnik /2010/ broj47/Hr/ hrva tski.pdf (Accessed: May 03, 2018).
34. The World Bank (2018). *Foreign direct investment, net inflows*. Available at: https://data.worldbank.org/indicator/BX.KLT.DINV.WD.GD.ZS, (Accessed: October 07, 2019).
35. World Economic Forum (2019). *The Global Competitiveness Report 2019*. Available at: http://www3. weforum.org/docs/, WEF_The Global Competitiveness Report 2019.pdf (Accessed: December 01, 2019).
36. World Economic Forum, *The Europe 2020 Competitiveness Report, Building a More Competitive Europe, 2014 edition*. Available at: http://reports.weforum.org/the-europe-2020-competitiveness-report/ (Accessed: November 24, 2019).