

Competitiveness of Woodworking Industries in the Balkan Countries – Comparative Advantages

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Abstract

The current economic and social circumstances present Europe with probably the greatest threats after the global financial crisis in 2008-2011. Competition in all sectors of the economy has increased. In these harsh economic and social conditions, enhancing the competitiveness of some of the most vulnerable countries in the European Union is the key factor for achieving improvement and social welfare. This paper offers a widely implemented and proven approach to competitiveness estimation – the Revealed Comparative Advantage Index (RCA). The estimation in some of the Balkan countries which has not been conducted yet provides the current state and future perspectives in woodworking – an economic sector subject to many discussions that provides employment of people in vulnerable regions. RCA reveals the strategic orientation and the way of thinking in the enterprises comprising the respective sector.

Keywords: competitiveness, Balkan countries, woodworking, RCA.

JEL Classification: L73; M21; L52

Introduction

There is an ongoing debate about the “entity” of competitiveness (Shafaei, R., 2009). Competitiveness as an economic category represents the ability and performance of a firm, sub-sector or country to sell and supply goods and services in a given market, in relation to the ability and performance of other firms, sub-sectors or countries in the same market. Competition reflects the rivalry in terms of production and trade between individuals or countries aimed at achieving greater profits and virtually represents an economic interaction process. Competition can be seen as

an important incentive to accelerate the effectiveness of industrial production (BAS, 1993). The notion of competitiveness is normally applied to “bloc” economies, entire countries, regions within countries, industry sectors, individual firms, and even to individual products and services of firms (Shafaei, R., 2009). In his research, Willoughby (2000) investigates competitiveness at three levels: “Micro Level” - a firm competitiveness, “Meso Level” - competitiveness in a specific region and “Macro Level” - the competitiveness at the national economy level.

At the macro level, Bulgaria occupies 25th place in the global competitiveness rankings. According to the most recent world competitive rankings of economies, published in the Global Competitiveness Report, Bulgaria is at 49th place out of 137 national economies which represents an improvement by five positions in comparison with 2015. However, the Bulgarian economy remains among the most uncompetitive European economies, as only Greece and Croatia have lower competitiveness indices. Romania is ranked five positions downward – at the 68th place (Klaus Schwab, 2017).

The competitiveness of the countries depends to a great extent on the competitiveness of the industries, manufacturing goods with high added value, including woodworking and furniture industry. Woodworking and furniture industries produces about 2.6% of the total national GDP, slightly more than 10% of the industrial GDP and more than 20% of the GDP of the manufacturing industry. According to the statistical data, more than 97% of the companies from the furniture sector in Bulgaria are small and medium enterprises.

Factors of industrial competitiveness

There are many research papers on the factors that influence competitiveness of a particular economic system. Many of the authors consider the Porter’s Diamond of competitiveness, consisting of four factors (Porter, 1998). In each particular research authors add or point out other factors such as spillovers (Kleynhans, 2016); foreign direct investment, structure, the amount or share of manufacturing value added (Zhao, 2007), direct and indirect causal indicators (Zhang, 2013). Horst et. al. (2017) developed and proved the role of environmental factors for the competitiveness of contemporary companies. Zhang et al. (2013) reformed the Porter’s model to the comprehensive requirements of modern economy adding and improving factors of the initial model. Technology,

input costs, production economies, product quality, enterprise differentiation, advertising, promotion and other external factors influence the competitiveness (Khushk et al., 2011).

Analyzing particular sectors of the economy authors such as SHA Jinghua et. al (2011) implemented Porter's Diamond using variables such as gross output of the investigated industries and related ones, value added ratio, profits and many others empirically and statistically useful to be assessed.

A wide variety of approaches for the selection of factors depends on the purpose of the study and the available information. We conclude that adapting Porter's four factors to the available information would give the appropriate and theoretically based approach to competitiveness assessment of particular economic system.

The estimations of various RCA indexes, regarding Turkey and Bulgaria, can be found in the research of Erkan and Sariçoban (2014). They implemented the Export Index of Revealed Comparative Advantage (RCA, LNRCA), Revealed Symmetric Comparative Advantage (RSCA) and Comparative Export Performance to EU+13 countries, including Bulgaria. Authors concluded that indices of RCA, RSCA and lnRCA state that the trade openness and export competitiveness of the EU+13 countries have been increasing after the accession in the EU.

Materials and Methods

There are various approaches and methodologies in the specialized literature for assessing the competitiveness at a sectoral level. The selection of the correct methodology for assessing the competitiveness of industrial enterprises depends to some extent on the specifics of the manufactured products/services and the level of added value.

In the same manner as the factors of competitiveness, methodology for its assessment also varies significantly and can be separated into assessment approaches and assessment methods. There are two categories of the measurement of industrial competitiveness, including show-indicators methods and multi-factor comprehensive evaluation methods (Peng Zhang, 2013). We can rewrite this statement as two different approaches. These approaches include methods for estimating the export, import or productivity competitiveness. Multi-factor approach include estimation of all the Porter's Diamond factors plus

contemporary Double Diamond determination by Rugman and D'Cruz (1993). Oral (1986) defines models for more of Diamond's factors, modelling the linear optimization functions for actual and potential position in mastery, productivity etc.

According to Shafaei et.al. (2009) in general, the results of the researches reveal that RCA (Revealed Comparative Advantage) can be used as an effective tool for measuring the competitiveness of industries. It has been used to directly evaluate competitiveness of woodworking with addition to other indicators (Sujová A. et.al., 2015). There the RCA indicator has been implemented in logarithmic scale. Revealed comparative advantage (RCA) is an index designed by Balassa in 1965 to measure comparative advantage from the perspective of commodity exports, and it is widely used by international organizations such as the World Bank (Cui et.al, 2016). This method is a part of methods implemented in show-indicators approach.

Mathematical formulation of RCA is following:

$$RCA = \frac{x_i / X_{it}}{x_w / X_w} \quad (1)$$

where: RCA is the Revealed Comparative Advantage index of the investigated industry; x_i is the exports of the woodworking sector of country i ; X_{it} total exports of country i ; x_w global exports of commodities produced in the sector; X_w world global exports.

The index directly estimates the competitiveness comparing the actual value to the interval scale of its power, presented in Table 1.

Table 1.
Correlations
between RCA range
and comparative
advantage
(Cui C. et. al, 2016)

RCA range	Comparative advantage
> 2.5	Very high
1.25 ~ 2.5	High
0.8 ~ 1.25	Medium and unstable
< 0.8	Low

In order to complete the analysis and make it more suitable for a cross-country comparison we applied the Net Comparative Advantage Index (NCA) proposed by Gnidchenko and Salnikov (2015). They comprehensively described the advantages and mostly disadvantages of Balassa's RCA. NCA has more of the features of RCA and is easy to be implemented to the countries, analysed in the current study due to data availability. NCA is implemented in the following form:

$$NCA = \frac{(X_{i,c,t} + M_{i,c,t}) \sum_c GDP_t}{(\sum_c X_{i,t} + \sum_c M_{i,t}) GDP_{c,t}} \quad (2)$$

where $X_{i,c,t}$ and $M_{i,c,t}$ are the export and the import for commodity i , country c and year t .

According to the Classification of Economic Activities – 2008, the economic activities included in the field of the woodworking industry are as follows:

Manufacture of wood and products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials

- Sawing, planning and impregnation of wood;
- Manufacture of articles of wood, cork, straw and plaiting materials;
- Manufacture of veneer sheets and wood-based panels;
- Manufacture of assembled parquet floorings;
- Manufacture of other builders' carpentry and joinery;
- Manufacture of wooden containers;
- Manufacture of other wood products; manufacture of articles of cork, straw and plaiting materials.

The competitiveness of the woodworking and furniture industry enterprises depends mainly on the raw materials used in the manufacturing process, the quality of materials and quality of the final product – wood products and furniture. Experts in the sector have determined the following specific characteristics as the main problems of the woodworking and furniture industry sector (Bulgarian Branch Chamber of Woodworking and Furniture Industry, 2015):

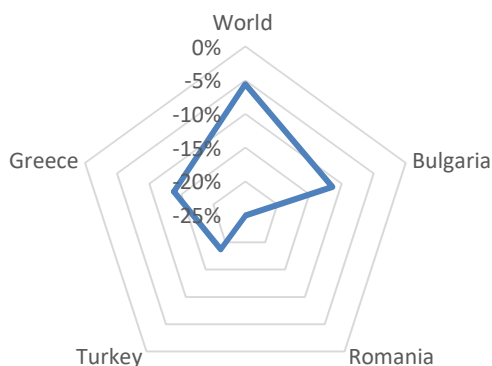
- Lack of qualified employees;
- Low export readiness;
- Raw materials.

All statistical data are derived from FAOSTAT and EUROSTAT.

Results

The index of comparative advantages reveals rather opposite trends in the surveyed countries. The exports of wood products tend to decrease over the surveyed time period. The average increment index from 2010 to 2015 is visualised on Fig.1.

Fig.1
Average increment
index of
woodworking
exports, base 2010



All studied countries are characterised by a negative change of export value. This in the context of the world tendencies in decrease of exports of such a products. The lower value of woodworking in comparison with the furniture or other industries producing commodities for final consumption is due probably to the growing shortage and demand of forest resources in many of the countries. Romanian exports decreased more significantly than in other studied countries. Bulgaria's woodworking exports are closely similar to the world trend. Greece and Turkey are in the middle of the countries discussed here with Greece performing a little better. Tendencies presented on Fig. 1 are compared to the stability of the processes on Fig. 2.

Fig.2.
Variation
coefficients for
exports in the
world and the
countries surveyed

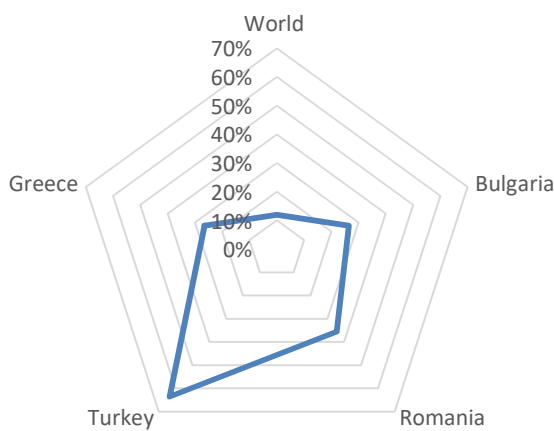
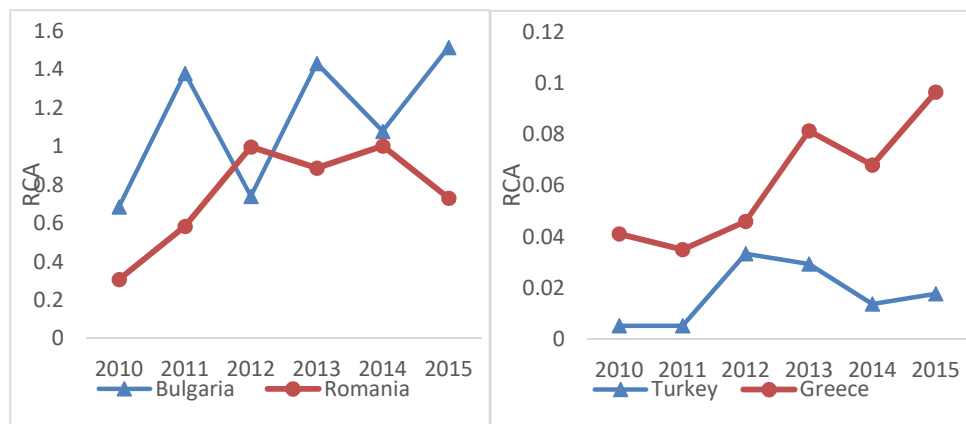


Fig. 2 reveals the stability of the decrease in exports. Globally, wood products tend to be less exported, which is the stable process with tendency to continue in the future. On the opposite side is Turkey, with very unstable decrease in export value. This means that the process could turn to the positive or very negative in the next few years. Bulgaria and Greece have stable negative tendencies. Romania is characterised by a very stable export process and could turn in to higher exports values in the future. RCA indices are shown on Fig. 3.

Fig.3. RCA indices



Indices clearly reveal the competitiveness and the direction for future development. Bulgaria has the highest comparative advantage, and Turkey has the lowest one. Bulgaria has significantly increased the competitiveness over the last 5 – 7 years. The problem stands in the unstable year-to-year levels. This means that the woodworking sector adapts to the external environment on yearly basis. Adaptation led to iterative stepwise improvement with jumps. They achieve higher levels in each of the “good” years. Another problem is the absence of any trend during the entire period – the clear evidence of fast-reactive or close to interactive nature of the sector. No trend can also be discovered in Turkey and some fair improvement began in 2014. Greece, similar to Turkey, also has a low index. Certain trend for the entire studied period exists which means purposeful improvement of the entire sector. Despite the negative trend in external environment and powerful competition of the neighbouring countries Bulgaria outlines the proactive nature of the sector. Manufacturers strategically and constantly improve production

and trade. Furthermore, the statistically significant trendline estimated in the current research is exponential. Romania has a nonlinear trend with two sub-periods – of growth and decrease before and after 2012, respectively. Low variations and negative increment appeared to be a structural problem with the comparative advantage of woodworking sector. The reasons should be discussed in internal demand and export of coniferous sawn wood materials.

Cross-country comparison can be properly made by the NCA indices, presented in Table 2.

Table 2.
NCA for
Wood-
processing
industries

	2010	2011	2012	2013	2014	2015
Bulgaria	0.491	0.657	0.539	0.559	0.471	0.495
Greece	-0.254	-0.168	-0.119	-0.155	-0.201	-0.237
Romania	2.498	2.229	2.636	2.817	2.611	2.558
Turkey	-0.142	-0.219	-0.230	-0.223	-0.172	-0.099

The values differ from the RCA ones which is understandable due to its disadvantages. The inclusion of the exports shifts the comparative advantages (CA) development in a different direction for some of the countries. On average base, the last place for the overall studied period is occupied by Greece. Romania is the leader regarding the difference from the RCA analysis. Imports make the country's wood-processing weak in manner of comparative advantage. For the overall period the Romanian import of wooden materials represents 18% of the export. Turkey has 2.13 times greater import than export of wood materials. In Greece there is a similar situation where the ratio is 3.36. Following the claim that NCA is more suitable than RCA for direct comparison it can be concluded that for the overall period that NCA changes the places of Bulgaria and Romania, remaining these for Greece and Turkey unchanged.

Further analyses are possible as a result of the NCA complexity. Implementing regression analysis is suitable to outline the main factors of CA. Regressions are cleaned of all biasness (heteroscedasticity, autocorrelation, collinearity etc.). Results are presented in Table 3.

Country	Factor	Unstandardized Coefficients		Durbin-Watson	R ²	Sig.	Collinearity Statistics	
		B	Std. Error				Tolerance	VIF
Bulgaria	(Constant)	0.332	0.118	1.805	0.960	0.068	0.301	3.318
	exp	0.0000070	0.000	dU:		0.013		
	imp	-0.0000095	0.000	1.142		0.009		
Romania	(Constant)	2.126	0.304	2.977	0.970	0.006	0.371	2.694
	exp	0.0000017	0.000	dU:		0.008		
	GDP	-0.0000123	0.000	1.142		0.038		
Greece	(Constant)	-0.146	0.052	2.292	0.969	0.069	0.520	1.924
	GDP	0.0000016	0.000	dU:		0.022		
	imp	-0.0000024	0.000	1.142		0.003		
Turkey	(Constant)	-0.191	0.089	2.16	0.930	0.120	0.949	1.054
	imp	0.000	0.000	dU:		0.010		
	exp	0.000	0.000	1.142		0.039		

Table 3. Regression analysis for CA factors

The influence of variables included in the NCA allows the implementation of a regression analysis which revealed the main factors for improvement. A number of variables appeared as a result of the preliminary analysis of biasness and exclusion of variables that cause it. From the results, presented in Table 3, it can be concluded that export moves countries with better NCA forward, even more than the overall economic conditions, which in general can make improvement of wood-processing slower. Higher imports of the countries with lower NCA is the main negative factor. There economic conditions appeared like beneficial factor.

Conclusions

The results of the analysis reveal that the competitiveness of the Bulgarian woodworking industry is the highest comparative advantage – competitiveness compared to the other studied countries in the region. Interactive strategy based on the overall sector reactions deprives the

Bulgarian woodworking competitiveness of overall trend, similar to Turkey. Romania and Greece have a trend and the strategic directions are clearly revealed by RCA. Romania expands to the internal market, while Greece tends to have stronger export competitiveness. NCA analysis gives a great opportunity to distinguish the factors influencing the improvement. Similar to the RCA analysis, the NCA outlines that exports are the main CA for the sector development. Imports are explainable worsening factor in negative net export countries and export cannot improve things until import have not been diminished.

The method used in the study again proved its robustness. The RCA revealed the state of the studied sector and raised important questions about its parameters, which cannot be directly compared or related to competitiveness. Despite the critical remarks of some authors, the index sets out the distinctive characteristics of the woodworking industry companies and demonstrates if there is a continuity and persistence in achieving the strategic goals or the sector is an interactive system adapting to global trends.

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