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QUANTITATIVE ANALYSIS OF THE COMPETITIVENESS OF BENELUX COUNTRIES

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Abstract. Economic competitiveness is not only a microeconomic problem for business management. It is also an important indicator of comparison among the economic development, advancement and sustainability of respective countries. The investigation of macroeconomic competitiveness of individual states is at the forefront of the discourse of both macroeconomic experts and politicians. In this study we focus on the economic competitiveness of the BENELUX countries, that is Belgium, the Netherlands and Luxemburg. The objective of the article is to identify the position of the BENELUX countries as an economic union with respect to global economy and the potential for the growth and sustainability of BENELUX economic competitiveness. The first part of the article addresses the theoretical principles of the given problematic, delineates competitiveness within its economic determinants and positions a discussion with specific focus on the BENELUX countries. The article also addresses the cooperation within the union of these states in terms of sustainability of competitiveness. The empirical part of the article analyses the competitiveness of the chosen states using standard macroeconomic methods. Three indices were utilised in the analysis, the Global Competitiveness Index (GCI), the 'Doing Business' index created by the World Bank, and the Economic Freedom Index (EFI). We have also subjected the selected indicators to a correlational analysis, the aim of which was to identify possible correlations between the chosen competitiveness index and a chosen parameter. The results of the analysis reveal the current economic position of the BENELUX countries, and outline the economic opportunities and threats to further development.

Keywords: economic competitiveness; national economy; economic union; BENELUX countries; economic competitiveness index

1. Introduction

There are several factors impacting the current economic status of individual countries, as well as the future development of the world economy as a whole: increasing globalisation of the world economy, international economic interdependence, the rapid advancement of communication technologies, trade liberalisation and shared economies. The economic competition of today aims to obtain a competitive advantage over other members of the world economy in order to maximise the gains for domestic economies. In today's world influenced by significant worldly phenomena the position of smaller states is markedly different to that of large, economically stronger states. Many states therefore choose to integrate themselves into unions and other forms of cooperation to lobby more effectively for their economic interests, products and services against bigger players on the global economic platform, thus achieving a positive economic balance.

The significance of investigating economic competitiveness of national economies is increasingly relevant in the era of integrated economies. Larger economic entities consist of smaller actors, which at any given time have a duty to evaluate the need and the purpose for remaining in the given integrated economy union. It is equally important for the economic union to assess the effectivity, productivity and competitiveness of its respective members so that the union benefits all parties involved. The comparison of the competitiveness of national economies with respect to other global economies has its individual meaning because such an analysis can reveal all kinds of positive and negative influences, opportunities and threats to the building of a competitively sustainable economic union. It is therefore clear that the quantitative analysis of economic phenomena is an important base line for macroeconomists as well as the representatives of central banks or high-ranking politicians, as the outcomes of these analyses are needed for the strategic direction of national economies.

It is important to note that economic competitiveness is one of the most frequented terms in expert circles and one of the most frequently discussed problems. It is therefore interesting that there is no one complex and specific definition that could cover all the determinants of the problematic. The term economic competitiveness is sometimes used to label the economic advantage of one economy over another (from a macroeconomic perspective) or a business subject (from a microeconomic perspective) in the global economic competitive environment. Competitiveness needs to be approached from a micro and a macroeconomic perspective. Several experts have expressed opinions on this problematic; it is generally not a simple task to define competitiveness as a phenomenon. This is because the central premise of the phenomenon is the ability of an individual economy to retain its unique position in the global market when faced with the unique capabilities of all other economies to do the same. Several scholars have tried to define the term (Casier, 2011; Matoskova & Galik, 2012; Tijanic & Obadic, 2015; Zámečník, & Rajnoha 2015; Simo et al., 2016; Brecka & Koraus, 2016; Rajnoha & Lesnikova, 2016; Melas, et al., 2017; Terzic, 2017; Tvaronavičienė, 2017; Domezet et al., 2018, Tvaronavičienė, 2018) taking into account the potential for competitiveness. The European Commission for example approaches the definition of competitiveness as the ability of a respective economy to establish itself on a platform of international economies and its components (economic, scientific, technical, social, demographic, political, legal and ecological) which present themselves as advantageous to the given entrepreneurial subjects in the given territory of its activity. Three levels of economic competitiveness are distinguished: macroeconomic, microeconomic and regional (known as NUTS III level). The Organisation for Economic Cooperation and Development (2017) also speaks about two levels of competitiveness in its definition, albeit not micro and macroeconomic, but academic and business levels. According to the academic level, economic competitiveness can be understood as a field of knowledge that analyses reality and forms policy that determines the capabilities of the state to create and sustain an environment conducive to upholding business values and public prosperity.

The business level understands economic competitiveness as a way of creating, developing and sustaining an environment of competitiveness from the perspective of the state.

In this paper we focus on the macroeconomic level in terms of both the real-time problematic of competitiveness, as well as the regional understanding of competitiveness as an expert economic term.

2. Literature review

Ensuring economic competitiveness of countries, regions and private economic subjects lies at the centre of interest for economists and politicians alike. Every economic entity, the European Union included, aims to set such conditions that would support an all-round development and growth of competitiveness. From a long-term perspective, Funta (2012) considers setting up a proper legal framework for this indispensable, in order for the prosperity of all concerned. Svec and Madlenak (2017) add that the continued breaking down of market barriers enables implementing reforms and innovative business concepts, which strengthens competitiveness of individual subjects, as well as economy as a whole. Spirkova et al. (2017) see the role of individual EU countries in the implementation of such policies that would allow for free competition of business subjects to offer quality goods and services on the market. Cihelkova (2012) believes that the new European Union Member States are faced with the tough task of supporting economic growth and competitiveness of the entire union by its active participation, increase in GDP, added value, advanced technologies etc. The author outlines the increasingly higher demands put on the new member states not only from the perpective of fulfilling macroeconomic targets but also the sustainability of such positive development for the future. This presents potential risks of integrating new regions into the economic union. In order to reduce this risk it will become necessary to monitor with much more rigour the fulfilment of the convergence criteria in the transitional period of these potential new members of the union, in order to support the economic capacity and competitiveness of the union as a whole. The weaker regions will therefore have to show greater effort to level their regional disparity levels within the global competitiveness market.

Parausic et al. (2014) remind that the aspects outlined by Cihelkova and others will be instrumental in determining the future development of both national and global competitiveness. That is why Cekmeova (2016) recommends for competitiveness to belong amongamong a holistic approach to economic policy and for a separate branch of focus to be created to outline proactive and negative determinants that influence competitiveness. Gavurova et al (2017) concurs with this view, stating that the maintaining of competitiveness of individual countries will prove effective in building long-term economic development of all European regions.

Kiselakova et al. (2018) investigated the individual competitiveness capability of EU regions and looked into these regional disparities, stemming from individual macroeconomic efficiencies. Their calculations utilise the GCI index, applied to sub-regions. Kolosta and Kral (2015) emphasise the importance of such research by correlating competitiveness, macroeconomic balance and well-applied regional policy. According to them, the European Union has all the prerequisites (legislative, material, technological etc.) necessary to reach its set competitiveness and development sustainability targets. Tvaronaviciene and Razminiene (2017) concur and see the future of increasing regional competitiveness in the creation of new cluster initiatives, capable of absorbing the needs of the region, of accumulating resources, capital and technologies for the region, which in turn results in synergy and increased competitiveness of the given region. Fojtikova and Stanickova (2017) have broadened this analysis by the investigation of international trade operations that impact and significantly support the future competitiveness of respective countries. Grancay et al (2015) claim that competitiveness of individual countries

depends on trade determinants and their alteration; in view of this they tested the applicability of the gravitational mode. Territorial investigation on the Visegrad four was carried out by Boda (2015) et al, later addressed by Cibik (2018) from a financial perspective.

Koraus et al (2017) bring another solution to the competitiveness conundrum, primarily to be addressed by stimulating economic growth through macroeconomic regulation of financial operations. Influencing the flow of national economies is first and foremost the role of central banks, more specifically in the case of the European Union we are speaking of the European Central Bank. In another article Dobovic et al (2016) expand this argument by another dimension, looking at specific strategies with a direct positive impact on long-term sustainability in economy and competitiveness. Fomina et al (2018) share the view that the only path towards a sustainable competitiveness capacity is through the mutual cooperation of small subjects and the state. Their research suggests that this is especially important in the field of industry as the greatest driver of national economies.

Balaz and Hamara (2012) carried out a research study focusing on the evaluation of competitiveness by reporting on its status during the financial crisis. It is precisely at this point of the economic cycle that emphasis has to be on such regulation of the economy that is capable of not only being sustainable but also regular increase of competitiveness. Similarly to them, Dobes et al (2017) investigated competitiveness from another point of view-the perception of other market participants. Their results show a clear correlation between the systematic and effective regulation of competitiveness-supporting processes by the state and other market participants. Without governmental support, measures supporting the increase of competitiveness cannot be taken.

Dulova Spisakova et al (2017) believe that competitiveness of individual countries is directly dependent on the investments into science and research as these are reflected in the resulting technologies enabling the production and services with higher added value. Their marketing and sales produce higher profit for both smaller subjects of the economy as much as the country as a whole. Hitka et al (2018) claim that the most important capital from a competitiveness perspective is social capital generated by the populace. Hafeez et al (2002) introduce the term sustainable competitiveness in their work and they see this phenomenon particularly in the key competencies of individual subjects, present in generating all competitive capabilities. Gavurova et al (2017) expands on this theory by claiming that there exists a relationship between trust and competitiveness building processes, as well as sustainable economic development and its growth.

In the following part of the article we focus on the selected countries, interesting for our purposes of evaluating competitiveness. These countries are Belgium, the Netherlands and Luxemburg, grouped in the union BENELUX. Kishluin (2012) claims that the policy making processes of this group are different to those of the rest of the EU. Their policies are markedly

pro-export in nature and their economies are primarily focused on producing export commodities, in which these countries manage to achieve either absolute or relative competitive advantage and are therefore continuously capable of positioning their production in the global market. Drynochkin and Sergeev (2016) point out similar differences. The authors have discovered that the Visegrad countries aim their cooperation primarily at mutual support, solidarity and help, whereas the BENELUX countries are more focused on their collective competitiveness targets in the global market. For a more in-depth analysis it is necessary to examine the development of the gross domestic product, as carried out by Cozanet (2014). In his research he compared the gross domestic product of the BENELUX union to that of Denmark; his results indicated that the BENELUX union is strongly pro-export with an open, liberal kind of economy with the main assets of the economy is the export of rapidly perishable products, albeit not food, such as flowers. Denmark, on the other hand, builds its

economy and competitiveness primarily on food exports. Denmark is the smallest scandinavian economy and it is significantly dependent on international trade. Prasteyo (2016) among other has tried to answer the question of the true accelerator of competitiveness, but there is no simple soluion as competitiveness is impacted by several indicators. Due to the small body of research done to date on the economies of the BENELUX countries, this article aims to fill this literature gap by addressing a selected body of macroeconomic problems in need of immediate attention.

3. Methodology

Appropriate choice of methodology is an inseparable part of research. Macroecnomic analyses mostly utilise quantitative data analysis, complemented by select qualitative methods. That is also the case with our study. The selection of appropriate methodology begins with defining the objective of the study.

The primary objective of this study is identifying the current level of economic competitiveness of the BENELUX countries in a global market. Furthermore, we also identify a sub-objective of the research article- addressing the possibilities of strengthening the economic competitiveness of these countries. Another sub-objective is to examine closely the economic aspects of the countries which strengthen and also decrease their economic competitiveness.

Structurally, the article is divided into theoretical and empirical sections. In the first section we delineate the most significant determinants of the BENELUX economic competitiveness. We also examine the cooperative value of the respective states in terms of sustainable economic competitiveness. The empirical section of the article offers an analytical evaluation of the joint economic competititveness of the BENELUX union, based on standard macroeconomic methodology.

Having established the main objective and the sub-objectives of the article, we can address the selected methodology. From a broader perspective we have selected three indices of competitiveness- the Global Competitiveness Index (GCI) , the World Bank's Index Doing Business, and the Economic Freedom Index (EFI). These indices were selected for their ability to evaluate accurately the basis of the problematic they were designed for, as well as their upstanding reputation among macroeconomic experts.

The examined countries of the BENELUX consist of Belgium, the Netherlands and Luxemburg. Research to date in this sphere has only addressed the European Union as a whole, or smaller subunits such as the Visegrad Group. Research into macroeconomic efficiency or competitiveness is sparse on the whole. These reasons lead us to the examination of the given problematic in this particular region of the EU, especially interesting for its potential for sustainable competitiveness. The object of the research is the macroeconomic indicator of competitiveness, which represents the potential for economic competition. We look at the respective countries individually and also as a unit.

The results of the analysis reveal the current economic position of the BENELUX countries, and outline the economic opportunities and threats to further development.

When evaluating global competitiveness we use GCI index, defined as the following: the index contains over 100 variables and over 60% of these variables stems from soft data and under 40% stems from hard data. This index indicates to what level of complexity the national competitiveness of a given country can be evaluated

holistically. The index contains a mathematically balanced average of the number of variables, whereby each variable is an individual reflection of competitiveness. The purpose of the index is to discover a realistically achievable economic growth in the long term.

Doing Business presents an index capable of illustrating the competitiveness of national economies, created by the World Bank. The World Bank belongs in the group of the most widely spread annual reports on competitiveness, as it publishes the list of 187 countries annually. The index is based on the empirical data examining the optimal status of macroeconomic regulatory measures, aimed at the development of entrepreneurship. The Doing Business Index integrates ten sub-indices, each representative of one sphere of business and entrepreneurship. The results of the index's mathematical calculations are values, whereby the greater the value the easier and more transparent the economic environment.

The Economic Freedom Index focuses on the evaluation of economic freedom. The index is applied worldwide in 178 countries. The purpose of the index is to uncover the determinants of economic freedom, financial freedom, the protection and the access to ownership rights. The results of the index's mathematical calculations are placed within an interval of 0 to 100. The greater the value, the greater the economic freedom in the respective economy.

Aside from the application of the above-mentioned indices, we expanded the quantitative analysis based on defining the main pillars of competitiveness. We have also subjected the selected indicators to a correlational analysis, the aim of which was to identify possible correlations between the chosen competitiveness index and a chosen parameter. We utilised Pearson's r correlational coefficient to ascertain the level of intensity of the linear correlation. With the adjusted r value we obtain the determining coefficient which determines the level of dispersion within the correlation, i.e. by what percentage the alteration of one variable alters the other. We therefore identify the strength of the relationship between the variables. Pearson's r is expressed as:

$$r = \frac{\sum_{i=1}^{n}(x_i - \overline{x})(y_i - \overline{y})}{\sqrt{\sum_{i=1}^{n}(x_i - \overline{x})^2 \sum_{i=1}^{n}(y_i - \overline{y})^2}}$$

4. Results and discussion

In the empirical part of the article we focus on evaluating the position of the BENELUX countries through the lens of the main macroeconomic indicator, economic competitiveness. In our analysis we used the following indices: the GCI, the Doing Business index and the EFI. It is important to note that the BENELUX countries

founded a customs union in 1948. In 1960 the customs union was replaced by a higher level of integration, an economic union, which enabled its members to freely move capital, goods, services and workforce.

At present Belgium, the Netherlands and Luxemburg enjoy a significant economic position not only within their region, but the European Union as a whole. They belong in a group of developed countries with advanced technology, impressive innovative capacity, quality education and other factors which together form a firm basis for building the competitiveness of the respective union members as well as the group as a whole.

Within our analysis we focused on evaluating the position of the respective three states in comparison with other European and North American states. The calculations were carried out using the GCI. As the full dataset for the year 2017 was unavailable at the time of publishing the article we carried out the analysis using the 2016 data. Figure 1 illustrates the situation described.
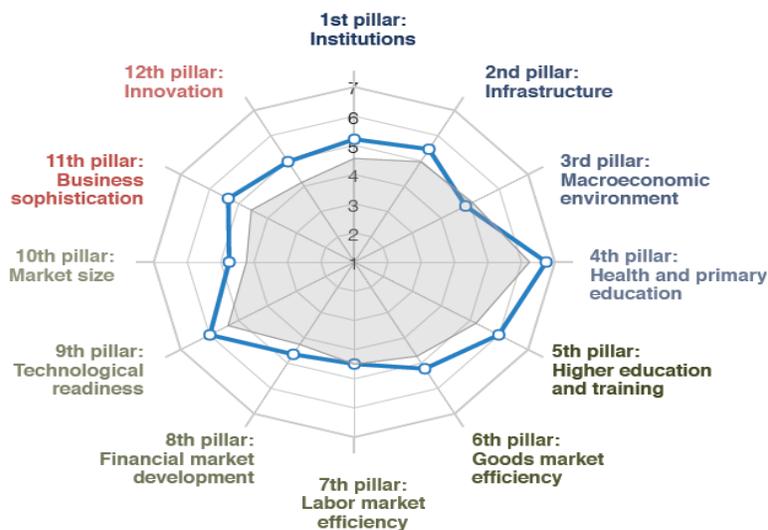

Fig.1. Competitiveness of Belgium in comparison with other European and North American states, according to the GCI in 2016.
Source: Schwab 2016 In: Mazák 2018

The graph clearly shows that in the case of Belgium the following competitiveness determinants are the most significant: primary schooling and healthcare, technological preparedness, business sophistication, infrastructure, and goods market efficiency. Good healthcare and an educated populace, a well-constructed infrastructure and technologies, as well as an agreeable business environment are the drivers behind the high competitiveness of the country (Figure 2).
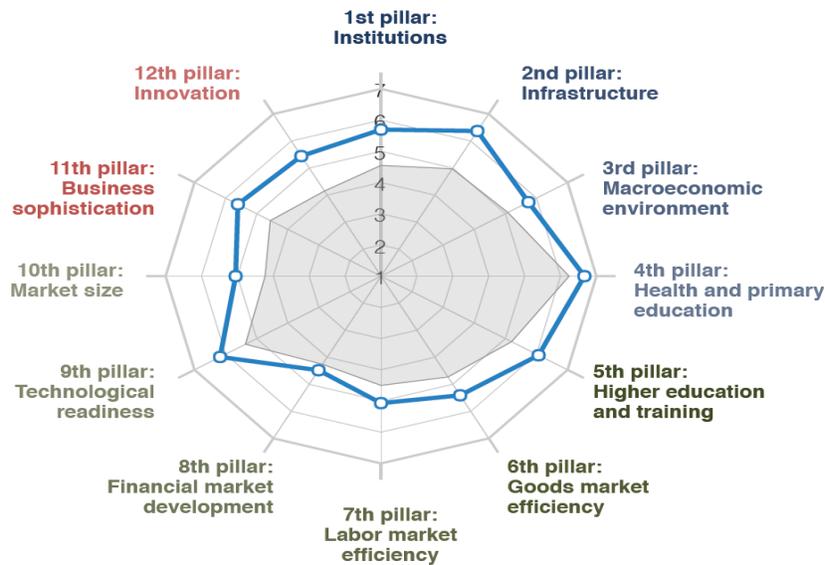
Fig.2. Competitiveness of the Netherlands in comparison with other European and North American states, according to the GCI in 2016.
Source: Schwab 2016 In: Mazák 2018

Figure 2 illustrates the results of the same analysis of competitiveness for the case of the Netherlands. There are no significant deviations from the results obtained by analysis of Belgium's competitiveness, as the main determinants of competitiveness are, similarly, education, infrastructure, technology and institutions. The interesting observation is that, similarly to Belgium, the financial market is not at the forefront of competitiveness factors. It would appear that other factors of the local economies are much more important in driving competitiveness.

Figure 3 follows the competitiveness analysis of the third state in the union, Luxemburg. The calculations were again carried out using the GCI. In this case there are definite differences in comparison with the other two states of the union. The most significant competitiveness determinants in the case of Luxemburg appear to be the following: technological readiness, macroeconomic environment, primary education and healthcare, institutions and goods market efficiency. The least significant determinant proved to be the size of the market. This factor is the least significant within the group as a whole (Figure 3).
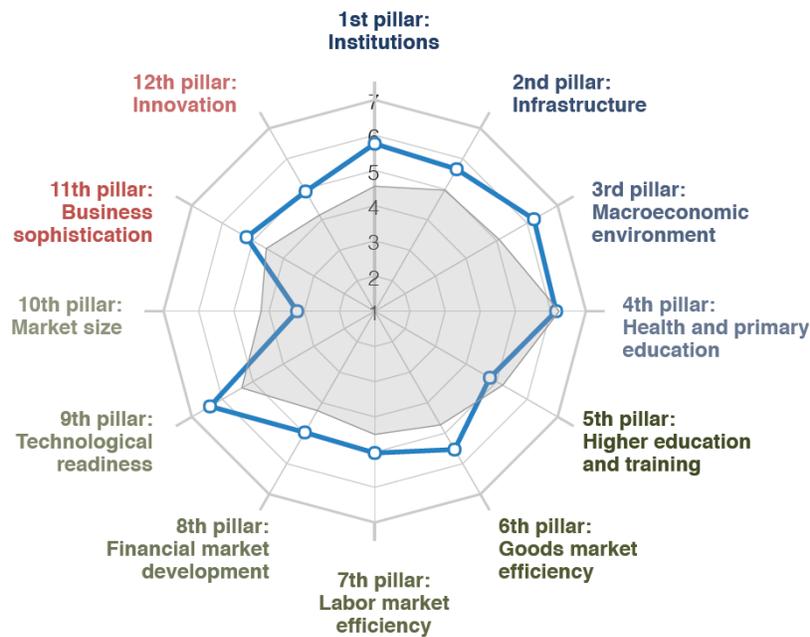
Fig.3. Competitiveness of Luxemburg in comparison with other European and North American states, according to the GCI in 2016
Source: Schwab 2016 In: Mazák 2018

The analysed states of Belgium, the Netherlands and Luxemburg are among the most competitive countries in the world, as confirmed by all three utilised indices. The complete ranking of the BENELUX states according to the individual indices is shown in tables 1 to 3. The examined time frame ranges from 2015 to 2017.

Table 1. Competitiveness of the BENELUX countries in 2015

State	Position of state in index		
	GCI	Doing Business	EFI
Belgium	18	38	35
The Netherlands	10	27	15
Luxemburg	7	57	16

Source: Author's own

Table 1 indicates the competitiveness rankings for the BENELUX countries for the year 2015. The rankings were calculated using all three indices as described in the methodology section of the paper (GCI, Doing Business index and EFI). The results show the highest ranking positions for the countries achieved with the GCI and the lowest positions in the rankings were attributed to the scores on the Doing Business index. The differences in calculations can be explained by the composition of the respective index, as each index has a different construct and takes into consideration different factors. The results of the GCI and EFI are the ones most resembling one another. The rankings show the position of the concrete state among other ranked states.

Table 2. Competitiveness of the BENELUX countries in 2016

State	Position of state in index		
	GCI	Doing Business	EFI
Belgium	17	42	49
The Netherlands	4	28	15
Luxemburg	20	59	14

Source: Author's own, Mazák (2018)

Table 2 shows the positions of states in the ranking for the year 2016. It is important to consider the input of the respective index. For example the GCI ranking for Belgium (17th place) is three positions above Luxemburg's (20th place). The EFI however ranks Luxemburg (14th place) 35 places above Belgium (49th place). A similar phenomenon can be observed with the indices' results for the Netherlands and Luxemburg. The EFI is almost identical for both cases, however the GCI shows a 17 place difference in the ranking and the Doing Business index shows a 31 place difference. Differences also exist among respective states in the indices. The results can be explained both by the development tendencies of the given economy, as well as the varied composition of the different indices. We observe that the year 2016 as opposed to 2015 (except for Luxemburg in the first case) does not observe significant changes in ranking using the GCI and the Doing Business index. As for the EFI, there is a clear difference recorded in the case of Belgium, and for the remaining countries the results oscillate around similar values (Table 3).

Table 3. Competitiveness of the BENELUX countries in 2017

State	Position of state in index		
	GCI	Doing Business	EFI
Belgium	17	52	49
The Netherlands	4	32	15
Luxemburg	20	63	14

Source: Author's own

It is interesting that with regards to the EFI competitiveness ranking, the results were identical for all three countries in the year 2016 and 2017. This is the case for the GCI as well. The only reported differences were shown in the Doing Business index rankings. This would indicate that in the given timeframe the countries did not record any significant macroeconomic changes which would consequently reflect themselves in the country's competitiveness ranking scores.

For deeper analysis we also carried out an advanced analysis using correlational analysis, using Pearson's r value. Based on this structural analysis we created a correlational matrix that illustrates the relationship between respective index values. We did this in order to comparatively assess the results. The findings are presented in Table 4.

Table 4. The correlational matrix, quantified by Pearson's r value

Pearson's r	Index		
	GCI	Doing Business	EFI
GCI	1.00	0.79	0.85
Doing Business	0.79	1.00	0.88
EFI	0.85	0.88	1.00

Source: Author's own

We investigated the presence of correlational dependence between the rankings constructed using renowned indices (GCI, Doing Business, EFI). The cross comparison was carried out using results from previous similar analyses. In a detailed examination of the results we observe that there are statistically significant correlations between respective indices; based on the high values recorded we conclude a statistically significant correlation. The 'p' value of Pearson's r places itself on the spectrum of 0.79 to 0.88, at which point we speak of a near perfect correlation. This shows that the competitiveness ranking using renowned indices is an empirically suitable way of analysis and using one of the most significant indices shows similar results when compared with another index used - this is particularly true when comparing the GCI and the EFI. In practice this indicates that competitiveness ranking can be carried out with an equal amount of quality, expertise and similar method of specificity in one index as much as the other two.

Conclusions

A purposeful building of competitiveness should definitely be at the heart of macro and microeconomic decisions, as well as the agenda of national economies. In terms of macroeconomic approaches to the problematic of competitiveness the state is the key actor in creating the conditions for healthy competitive environments. The state plays a key role in creating the legislative environment conducive to the free movement of capital, goods, services, human capital, financial capital and in removing the barriers and creating equal opportunities and conditions for the members of the market and the non-commercial sectors alike. Economic subjects therefore have an open space for economic competition where each participant must conduct themselves in order to do better than the rest. Such an environment is preconditioned by a unified concept and policy- making strategies on a long-term basis of taking appropriate measures in harmony with the opinions of experts.

The competitiveness of individual economies is directly derived from the level of competitiveness on a microeconomic, that is, business level. Aside from the competitiveness of businesses, the competitiveness of other subjects of the national economies is also a contributing factor to the general construction of the country's economic competitiveness. These are for example, economic guilds and organisations of commercial and non-commercial nature, or also governmental businesses, the banking sector or the financial sector. All of these either contribute to the driving or the obstruction of the country's economic competitiveness. It is incredibly important to pay special attention to the competitiveness factors as a collective, rather than in isolation, be it local, regional, national or global markets. Sustainable development can only be achieved by a well-thought-out economic strategy, by free movement of manufactured products and by effective use of governmental tools in favour of a rational regulatory economic policy.

In this paper we focused on the examination of competitiveness of national economies grouped into the BENELUX economic union. We focused on a quantitative evaluation of the competitiveness of Belgium, the

Netherlands and Luxemburg with the goal of identifying their current position of competitiveness in the global market. The gathered fact-based material utilised for the analysis was complemented by secondary data and scholarly research into the subject. On a theoretical level it was clear to us that there is no comprehensive body of literature and research on the economic union of the three countries and the research into their competitiveness is sporadic at best. Filling this literature gap is, among other objectives, where the paper's true value can be found; furthering research into competitiveness evaluation of the EU. On a practical level we obtained the following conclusions:

* The BENELUX countries benefit from their competitiveness due to their combined economies, innovative capacity, industrial maturity, technological readiness and a quality educational system.

* The commodities structure of the analysed countries heavily relies on the production of non-food commodities.

* The quantitative results of the analysis, utilising competitiveness indices lead to the same results when applied individually with minimal deviation, considering specific composition criteria of the indices.

* The BENELUX countries regularly place among the top positions of competitiveness, which is indicative of their systematic efforts at bettering their own competitive capabilities based on a well-thought-out economic strategy, education and institutional background.

* The executive body for competitiveness and innovation VASHI has its headquarters in Belgium, directly in Brussels.

* From the perspective of effectivity, measured by the index of innovation effectivity, Luxemburg and the Netherlands occupy two of the top three places in the ranking.

Our results contain important information about the current position of the BENELUX countries and their competitiveness. They can be utilised as a basis for further research; as foundation for the assessment of macroeconomic theory of regional character within the EU; as foundation for political and economic policy-making processes in these or similar countries. The future economic growth and development sustainability for European regions will undoubtedly depend on the ability of policy makers to listen to the recommendations of experts in this field.

Michal Mazak is an expert in economy and a practicing lawyer, as well as a doctoral candidate of the Economics and Business Faculty of the Pan-European University in Bratislava. His background and research interests include the fields of economic competitiveness, economic efficiency, effectivity and legislative framework for economic growth of small businesses, regions and countries. He has authored several scholarly works, scientific research papers and has contributed to several international economic for a. His dotctoral thesis deals preciselz with the competitiveness capacitz of the BENELUX states.

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