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Assessment of the factors influencing competitiveness fostering the country's sustainability

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ABSTRACT

Competitiveness is a complex economic category that is closely related to the country's sustainability. Sustainability can be achieved through the creation of added value, the fostering of quality management and the applying principles of social responsibility, and each area of the activity trying to be competitive at the same time. It follows that both competitiveness and sustainability are dependent on a number of factors at both micro and macro levels. The objective of the article is to assess the impact of factors on competitiveness and consequently on the sustainability of the country. In addition, the following tasks have been implemented: to analyze the theoretical aspects of competitiveness and sustainability; to reveal the main factors, that have an influence on the competitiveness; to assess the influence of factors on competitiveness fostering the sustainability. In this article, the following methods of analysis are used: an analysis and summary of the scientific literature, analysis of the statistical data, Granger causality test, correlation and regression analysis.

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Introduction

In the modern world, while competitiveness and growth are one of the most popular topics, but this phenomenon is hard to measure. Many scientists are analyzing competitiveness in various ways and trying to assess possibilities of growth. The term competitiveness became known in the XX century, but reached popularity only in the 7th decade of the XX century. At that time competitiveness was defined as the ability to deliver services and products to the market on time, in the right place and in the right form (Lotfi & Karim, 2016). Other scientists (Möbius & Althammer, 2020) added that competitiveness must be measured by prices and costs, market share and

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productivity, that change over time, but it is necessary to remind, that competitiveness is closely related to the sustainability, because is affected mainly by economic, environmental and social factors (Zhou & Lu, 2020). This gave rise to a new approach to competitiveness through the prism of gross domestic product (GDP).

GDP becomes the cornerstone of competitiveness based on productivity principles. It follows that competitiveness is understood as the ability to achieve a competitive advantage, higher income levels and higher employment in various ways (Borowiecki & Siuta-Tokarska, 2017; Lotfi & Karim, 2016). In this context, it is essential to identify and assess the impact of factors affecting productivity and, consequently, in order to achieve sustainable development of the country. This is where the need for a sustainable competitiveness category analysis becomes very important.

The objective of the article is to assess the impact of factors on competitiveness and on the country's sustainability. Task-related to this objective is formed: to analyze the scientific literature in the context of competitiveness and sustainability; to identify the main factors affecting competitiveness and to assess the influence of factors on competitiveness and sustainability development. The following research methods have been applied: analysis and summary of the scientific literature, statistical data analysis, Granger causality test, correlation-regression analysis. Here are applied also a few limitations. Firstly, here are analyzed statistical data for a period of 1996-2018, in the case of Baltic states. Baltic states are selected taking into account its very similar economic situation and the ability to compare these three states very easily.

From this point of view it is important to assess the relationships between productivity, competitiveness and factors influencing it.

1. Theoretical concepts of competitiveness and sustainability

Competitiveness is a multifaceted, multidimensional category that is closely related to the ability to adapt to a constantly changing economic environment. Economic development is a prerequisite for productivity and consequently for growth in competitiveness (Havierniková & Kordoš, 2019; Kiseláková et al., 2018; Korauš et al., 2018; Mikhaylov et al., 2018; Voronkova et al., 2019; Zeibote et al., 2019).

Competitiveness can be measured at different levels: country and company, but in this article, competitiveness is understood and measured at the macro level. According to M. Porter (1990), competitiveness is a multidimensional category based on the principles of productivity. The concept based on productivity principles is significant in its ability to combine the value of products and services and to properly assess it globally in order to increase operational efficiency. The country's competitiveness is also seen as a complex category characterized by market activity, high income, high volume and efficient use of production resources, high employment and economic efficiency (Borowiecki & Siuta-Tokarska, 2017). It follows that competitiveness is a prerequisite for ensuring a high standard of living and adequate wage and income growth. All of these principles include precisely the Cobb-Douglas production function (1) (Kleyn et al., 2017; Maxwell & Essi, 2019).

$$Y = \theta_0 K_1^\theta L_2^\theta e^u \quad (1)$$

where: Y - output results; K - capital invested in production; L - labour invested in production; θ_0 - technological change; $\theta_{1,2}$ - parameters of labour and capital flexibility; e - basis of natural logarithm; u - unexpected or stochastic error.

This function (1) can be transformed into a logarithmic value for stationary data and reliable results (2).

$$\text{Ln}y = \text{Ln}\theta_0 + \theta_1\text{Ln}K + \theta_2\text{Ln}L + u \quad (2)$$

In terms of the country's competitiveness, it depends on the level of development and the structure of the economy, as there is a set of institutions, policies and relevant actions (Kubickova, 2019). It is the ability of a country to promote wage growth, state regulation and to create economic, social infrastructural and institutional conditions that result in better activity and meet the needs of the population more than those of other countries (Möbius & Althammer, 2020).

The main reasons for increasing the importance of competitiveness are highlighted (Möbius & Althammer, 2020):

- the globalization of the economy open to the movement of goods, services, capital, people and knowledge, which is stimulated by improvements in information technologies and transport systems;
- increasing the potential of the population and highlighting new requirements, needs and opportunities;
- efficient approvement of scientific results into practice and economic growth.

Active use and integration of science innovation and technology are key prerequisites for economic development and competitiveness. Emphasizes the need to focus on the sustainability of country development as an economic, political and territorial autonomy alongside the sustainability analysis of system or process development, where growth in competitiveness becomes a key lever for sustainable development in the country.

The sustainability category was highlighted in 1987 y. by the Brundtland Commission (United Nations 1987). The report by the Brundtland Commission (United Nations 1987) is stated that sustainability is a multifaceted category that contains different areas. Sustainability is defined as meeting current needs without limiting the ability of future generations to meet their own needs (Kovács & Illés, 2019) and it is necessary to purposefully and efficiently manage available information, disposable materials and capital flow to meet customer and shareholder needs.

According to the Drabavičius (2019) social responsibility, environmental protection and sustainable economic activity are the main aspects of sustainability, therefore, three main categories of sustainability are distinguished: social responsibility (influence of social responsibility on competitive advantage), environmental protection (impact of the environment on the competitiveness of business), sustainable economic utility (influence of the principle of sustainable economic activity to ensure the competitiveness of businesses).

Figure 1 shows a set of sustainability components. Information systems for knowledge, decision management and uncertainty assessment are essential elements. This

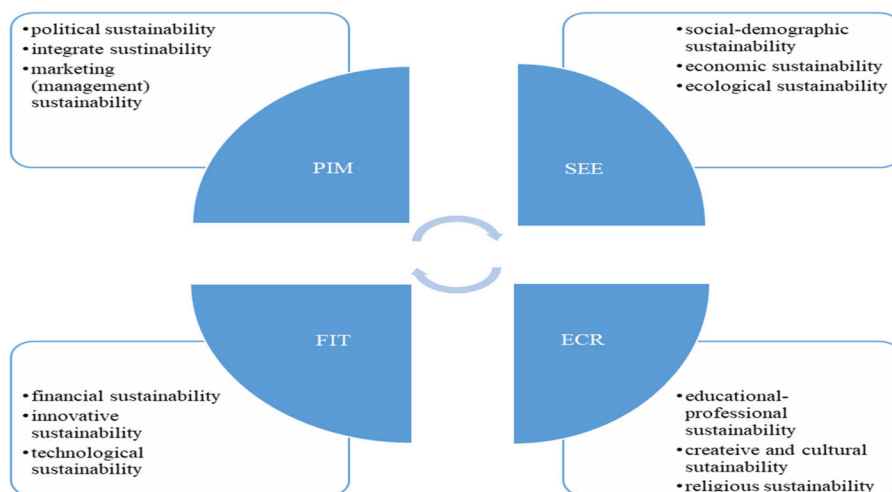


Figure 1. The whole of components that carry out the country's universal development sustainability and a whole of knowledge and expert assessment tools for universal development sustainability management (Source: Flores & Falcade, 2019).

means that there is a need to turn innovation into new knowledge. The process is also being adjusted by the key components of sustainability.

In this case, there are 12 of them and they can be divided into 4 groups: PIM, SEE, FIT, ECR.

PIM. This group is defined through the possibilities of guaranteeing the representation of public interests in international institutions. Predictive integration of the country into local, regional or global institutions of general or economic security, providing security at a reasonable cost to the country. It also seeks to ensure a sustainable export-import flow through marketing principles and the development of the benefits of overall social and economic outcomes.

SEE. This group defines the ability to unify the different interests of different social groups based on scientifically recognized regularities. It also seeks to rationalize the use of internal and external resources to achieve the desired value while maintaining the diversity and efficiency of biological systems in the country.

FIT. This group defines the ability to ensure the use of advanced technologies based on the most efficient innovations. It seeks the power of a financial system that allows the public sector to provide the financial resources it needs to meet its international obligations.

ECR. This group is defined through the ability to combine learning and creativity in the development of business analytics and the knowledge economy, to achieve a balance between supply and demand in the labour market and through the recognition of the spiritual values of humanity. It develops the ability to use the intellect to create something new and valuable.

Because sustainability is a complex category, quantitative measurement of sustainability is recognized as an extremely important tool for designing and managing sustainable development, which, unfortunately, does not yet have a single concept of adequate measurement and assessment. Given the most of today's sustainability

feasibility analysis or design, issues are related to three development subsystems – the social, economic and ecological measurements and assessments are made by subdivision of the subsystems or aggregated by each subsystem as a whole.

Sustainable competitiveness includes innovative measurement, helps to find new insights and promotes sustainable development (Möbius & Althammer, 2020; Pierros, 2020). Sustainable competitiveness is achieved through innovation and modernization and specialization (Hamerla, 2018; Havierníková & Kordoš, 2019). As the aim of competitiveness is to create opportunities for learning and applying innovative technologies (García-Sánchez, David Siles & María de Mar Vázquez-Méndez, 2019) and to adapt to technological development and to increase the quantity and quality of production (services) through innovation, improve management processes and motivate them to work productively (Wosiek, 2019). This, in turn, increases competitiveness, decreases deficits and improves the quality of life (Lotfi & Karim, 2016) and assessing macroeconomic and sustainable competitiveness in a macro-environment is not a prerequisite for maintaining high living standards in the long run, but it is necessary to assess the social and environmental conditions.

It follows that many factors must be taken into account when assessing the level of competitiveness of the country. This article uses sustainable competitiveness as a result of the interaction between competitiveness and sustainable development, which shows how a country can use its resources efficiently, be competitive, but not limit its use to future generations. Such an assessment aimed to systematize and add the factors affecting competitiveness (as well sustainability), therefore resulting in sustainable competitiveness.

2. Factors influencing sustainable competitiveness

Sustainable competitiveness is a multifaceted phenomenon and is affected by many factors at both micro and macro levels. Sustainable competitiveness is also affected by certain factors. [Figure 2](#) shows the factors that influence sustainable competitiveness.

[Figure 2](#) shows that external factors are seen to occur on a national (or global) scale and are divided into several groups (Abreu-Novais et al., 2016; Borowiecki & Siuta-Tokarska, 2017; Lotfi & Karim, 2016; Toppinen et al., 2019): productivity (understood through improving work organization, positive changes in the quality of production factors, improving the production process or efficient allocation of resources) and efficiency factors (quality of higher education, labour market efficiency, market size), political factors (legal norms, custom tariffs), trade liberalization (global demand, because enabling foreign partners to choose properly), exchange rates (falling exchange rates affect exports and limit externalities, while devaluation promotes development and international competitiveness), foreign influence (foreign capital is a source of funds for creating a dynamic advantage and investment stimulates technological innovation and improves factor productivity), economic factors (macroeconomic stability, price level, understanding of competitor's behaviour, meeting customer needs), demographic factors, technological and innovation factors (technological supply, level of business and innovation development), natural factors, cultural



Figure 2. Macro-level factors affecting sustainable competitiveness (Source: Compiled by the authors based on Borowiecki & Siuta-Tokarska, 2017; Abreu-Novais et al., 2016; Lotfi & Karim, 2016; Toppinen et al., 2019).

factors, country policy towards the region, globalization, communication networks, ecological factors, financial situation (García-Sánchez et al., 2019).

The article focuses more specifically on economic and social factors, namely on wages and employment and their impact on productivity and therefore introduces an estimated theoretical relationship between these three factors. These three factors were distinguished using the results of correlation-regression analysis, where were analysed and other factors (like inflation, taxes and other), but these three factors were marked as the most important.

2.1. The relationships between wages, employment and sustainable competitiveness

Fostering economic development and efficient use of available resources to increase the size of gross domestic product is one of the key challenges for the country. As mentioned above, sustainable competitiveness is one of the key factors affecting the country's economic and sustainable development. These effects are manifested through the ability to use available resources efficiently without limiting their use to future generations.

It is also important to mention that competitiveness is based on the growth of economic activity and the attractiveness of innovation. Innovation is a key lever for the country's development towards greater competitiveness (Wosiek, 2019). The key factors of innovations are sustainability principles (García-Sánchez et al., 2019), which requires lifelong learning, upgrading existing skills, promoting employment and adapting the workforce to current conditions. This creates a modern knowledge-based society and fosters sustainable development in the country. At this article innovation is perceived as the main factors, what influence the competencies of employees and is the base for the human capital development. It follows that the relationship between competitiveness and the factors affecting it must be assessed. Table 1 shows the cross-sectional analysis of the relationship between competitiveness and the factors affecting it.

The interaction between labour productivity, employment, labour costs, openness, globalization and wages is an important economic and legal issue and their

Table 1. Points of view of the analysis of competitiveness and factors affecting it.

| Factors affecting competitiveness | Sources |
|-----------------------------------|---|
| Wages | Yusof, 2008; Narayan & Smyth, 2009; Karaalp-Orhan, |
| Labour costs, productivity | 2017; Kubickova, 2019; Möbius & Althammer, Möbius & |
| Employment, unemployment | Althammer, 2020. |
| Openness, globalization | |

Source: Compiled by the authors based on scientific literature.

relationship is closely related to the increase in competitiveness (Table 1). The relationships between wages and productivity are based on the fact that higher capital raises labour demand and wages, while wage growth contributes to productivity and competitiveness. From a macroeconomic perspective, in the context of globalization and the openness of countries to international trade, productivity and wage growth are becoming crucial factors in countries' international competitiveness. In this aspect, competitiveness is seen as the ability to compete in terms of time, quality and knowledge. Competitiveness is best demonstrated by the share of exports, productivity and operating costs and exports are an important indicator of international competitiveness (Borowski, 2015; García-Sánchez et al., 2019). The growth of competitiveness and especially productivity promotes economic development (Karaalp-Orhan, 2017) and therefore the relation between competitiveness, wages and employment rate is a frequent research object.

Based on the results of the scientific analysis there are two ways how to increase competitiveness: to use resources efficiently or to increase employment. Nowadays competitive environment also creates the conditions for maximizing employee interest in increasing productivity, which can be achieved through appropriate material motivation and science-based wage setting and in a more competitive economy, it is possible to increase the income level of the population (Karaalp-Orhan, 2017).

It follows that there is a need to modify the above productivity function to include additional factors: investment (I) and wage (W) and to express work through the employment rate so that the productivity function used at work would look like this (3):

$$Y = C_1^{\theta} E_2^{\theta} I_3^{\theta} W_4^{\theta} e^u \quad (3)$$

This function can be transformed into logarithmic values to provide stationary data and reliable results (4).

$$\ln Y = \ln C_1^{\theta} + \theta_1 \ln C + \theta_2 \ln E + \theta_3 \ln I + \theta_4 \ln W + u \quad (4)$$

To sum up, wages as a key motivator, employment as a measure of human capital expression and productivity, expressed in terms of the gross domestic product have the greatest impact on competitiveness. This reaffirms the need to modify the Cobb-Douglas function and add to it two factors: investment and wages.

Table 2. Values of correlation coefficient.

| Coefficient | 0 | 0,01-0,19 | 0,20-0,49 | 0,50-0,69 | 0,70-0,89 | 0,90-1,00 |
|---------------------------|-------------|--------------------|---------------|------------------|-----------------|----------------------|
| Strength of the relations | No relation | Very weak relation | Weak relation | Average relation | Strong relation | Very strong relation |

Source: Compiled by the authors based on Dudzevičiūtė and Čekanauskas (2014).

3. Assessment of the development of the factors impact on sustainable competitiveness

In order to analyze and quantify the impact of factors on the promotion of sustainable competitiveness, researchers (Dudzevičiūtė & Čekanauskas, 2014; Trica et al., 2019) propose the use of correlation-regression analysis and Granger causality test.

3.1. Research methodology

The research is carried out in several stages:

- To carry out, systematize and process statistical data;
- To establish a causal link between competitiveness and its determinants;
- To describe the obtained results.

In assessing the relationship between the factors and the strength of that relationship, it is appropriate to refer to the values of the correlation coefficients (Table 2).

It is appropriate to use time series data for macroeconomic indicators to distinguish and assess the factors affecting productivity dynamic. The following data are used in the analysis:

- competitiveness (Y), which is expressed in terms of gross domestic product amount per year;
- employment (X1), which is expressed in terms of employment;
- wages (X2), which is expressed in terms of average wages per year;
- investment (X3), which is expressed in terms of foreign direct investment amount per year;
- unemployment (X4), which is expressed in terms of unemployment level per year;
- capital (X5), which is expressed in terms of capital amount per year.

All data are collected from the Eurostat database and the selected analysis period is 1996-2018 y. y. which means that 23 observations were made. Selected long range of data can very precisely show the trend of main results and helps to making the necessary and efficient decisions. The study was done in the case of the Baltic States (Lithuania, Latvia and Estonia). The longer the period and the more consistent the data, the more reliable the expected results are. Before evaluating the relationships between productivity and the factors affecting it (i. e. wages, employment and other) it is necessary to check the characteristics of time series and more precisely their stationarity.

Non-stationarity is common to many macroeconomic and financial time series. The first and most important step in time series analysis is to check the unit root. The most appropriate method can be used for verification from a wide range (Faisal et al., 2018; Popović & Erić, 2018; Sasongko et al., 2019): Dickey-Fuller (DF) test, Augmented Dickey-Fuller (ADF) test, Philip Perron (PP) test, Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test.

For further calculations, the Augmented Dickey-Fuller test is used. ADF test is an augmented Dickey-Fuller test for the existence of unit roots with a maximum number of delays (lags) for multiple model types. The test eliminates structural effects (auto-correlation) and is more appropriate for larger and more complex samples. The ADF test helps to assess the overall order of integration, which accepts economic processes as I(0) or I(1) and very rarely I(2). For lines that are stationary after differentiation, they are integrated with 1 and noted by I(n) (Faisal et al., 2018; Popović & Erić, 2018). The statistical value DF is also calculated (5), which is compared to the critical value (determined by Mac Kinnon) and deducted from the Dickey-Fuller test table.

$$DF = \frac{\hat{\delta}}{S_{\delta}} \quad (5)$$

This is a test used to identify the unit root and to confirm that the variables are non-stationary (when a constant average is not maintained because higher estimates are followed by smaller ones and the process becomes unpredictable, constant shock prevails) or stationary (when the low-efficiency hypothesis is accepted) (Asuamah et al., 2016; Gerolimetto & Magrini, 2016).

It is assumed that the data in the Y sample behave according to the AR (p) autoregressive process with the accompanying delay p in the change of the indicator Δy . P represents the depth of the delays being analyzed and the influence of the last few periods are measured by determining their influence on today's changes.

In estimating stationarity of time series an alternative to the ADF model (Gerolimetto & Magrini, 2016; Popović & Erić, 2018), which uses constant shift α and trend change λ_t is applied (6).

$$\Delta y_t = \alpha + \lambda t + \beta y_{t=1} \sum_{j=1}^p \Delta y_j \Delta y_{t-j} + \varepsilon_t \quad (6)$$

Econometric analysis uses big data, so proper processing requires the use of appropriate software. The Granger causality test is closely related to the vector autoregression (VAR) model (Götz et al., 2016). C. Granger (1969) introduced the concept of causality, stating that „if X is dependent on Y and knowing the past values of X and Y, one can predict the trend of Y”. The Granger causality test for time series is based on the assumption, that „if X affects Y, then before Y changes we should have X changes, but not the other way around” (Katircioğlu & Zabolotnov, 2020). It means, that the Granger causality test measures causality between the two variables X and Y and explains how much the current values of Y can be explained by changes in the values of X, while also assessing the delay of the effect. Engle and Granger (1969) state that “variables are cointegrated if they have a stochastic trend”.

Determining the cointegration of variables for two-time series x_t and y_t a regression equation (7) is formed (Gerolimetto & Magrini, 2016).

$$y_t = \sum_{i=1}^k \alpha_i y_{t-i} + \sum_{i=1}^k \beta_i x_{t-i} - u_t \quad (7)$$

where: u_t is the “white noise” residue.

It follows from the condition that $\beta_i = 0$ ($i = 1, 2, \dots, k$) and x_t is not the cause of y_t . That means that the Granger causality test measures the effect of past observations of one variable on the present value of another variable.

The concept of Granger causality is “based on long-term observation of changes in variables and the ability to predict the values of variables by using the knowledge of the past values of other variables, thus demonstrating a form of causality” (Chu et al., 2016). The causality test results are “sensitive to external influences and time-sensitive” and therefore the analysis of the relationship between causality and causation requires the selection of an appropriate number of lags. The Granger test is based on the simple Wald test, which allows testing the significance of the second variable’s number of delays. Applying this approach to causation can “determine the number of delays in the equality of another variable’s autoregressive model and improve the prediction of another variable” (Bilen et al., 2017). It is necessary to select a number of delays that meet the Standard criteria for stationarity (showing correlation, normal distribution, homogenous). In this article, the Granger causality test is performed with one period delay (lag), since delays eliminate the influence of a small amount of data on results. To determine the optimal number of delays, a VAR delay estimation method was performed. The test results depend on the conditional frequency of the variables and the reasonable frequency of the observations, length of the period and the accuracy of the data (Götz et al., 2016). There is only one disadvantage of the most popular econometric technique – “one cannot investigate the causality at different data frequencies” (Bilen et al., 2017).

Using the Granger causality test, the regression equations (8) of the vector autoregression model are constructed.

$$y_t = \alpha_0 + \sum_{i=1}^m \alpha_i y_{t-i} + \sum_{i=1}^m \beta_i x_{t-i} + \varepsilon_t \quad (8)$$

where: ε_t and u_t are uncorrelated random errors (“white noise”).

During testing are formed hypotheses. The null hypothesis states that X is not the cause of Y Granger and the first hypothesis states that X is the cause of Y Granger. This analyzes the dual relationships between two variables in different regressions and verifies that the values of one variable are sufficiently informative to predict the values of the other variable. The F statistic estimator is used to test the joint hypothesis (for each equation, the null hypothesis of the statistical significance of the coefficients is tested) (Popović & Erić, 2018; Sasongko et al., 2019).

$$\beta_1 = \beta_2 = \beta_3 = \dots = \beta_m = 0$$

Two hypotheses have been formed for verification:

H0: X is not the cause of Y Granger and the variables are not integrated.

H1: X is the cause of Y Granger and the variables are cointegrated.

Panel data and time series are used to test hypotheses using the VAR technique. It should be mentioned that the influence of X on Y indicates the possibility of causation, whereas rejecting the null hypothesis implies that X is not the cause of Y. A 5% significance level is selected for hypothesis testing. If the p values remain greater than the selected significance level ($\alpha = 0,05$) this shows that the values of X are the cause of Y Granger. In this case, the null hypothesis that X is not the cause of Y Granger is rejected.

Also, another hypothesis has been formed for the research: if productivity increases, value-added increases but there is insufficient redistribution to wage growth, turnover growth is faster, social development problems (shortage of skilled labour) and investment in human capital are decreasing.

3.2. Research results

Based on the theoretical propositions of competitiveness is influenced by many factors, including wages, employment, capital and investment. For the analysis of the causal relationships between competitiveness and the above-mentioned factors, four key factors are selected: wages, employment, capital and investment. In order to assess the significance of the changes in the above factors, a study on the changes between wages, employment, investments and productivity (competitiveness) was carried out, the results of which are presented in [Table 3](#).

The results showed that productivity is growing faster than employment, investment in the Baltic states, but other factors also have to be taken into consideration, because the Granger causality test results showed that wages are the strongest factor in competitiveness in the three Baltic states and the strongest connection is in Lithuania. This means that wage fluctuations have an impact on competitiveness as rising wages motivate workers to work more productively and thus improve the economic situation in the country. Employment has the weakest impact on competitiveness as globalization puts workers at a very disadvantageous position and due to the increasing need for technology, many companies are trying to use better technology rather than employing additional people. A graphical view of the results is shown in [Figure 3](#).

Table 3. Relationship between productivity and wages, employment, investment, capital growth.

| Country | P/W | P/E | P/I | P/C |
|-----------|------|------|------|------|
| Estonia | 0,53 | 6,65 | 1,62 | 0,88 |
| Latvia | 2,17 | 5,7 | 1,28 | 2,79 |
| Lithuania | 1,17 | 8,09 | 1,26 | 0,73 |

Source: Compiled by the authors based on own calculations and use of data presented in Eurostat (2019).

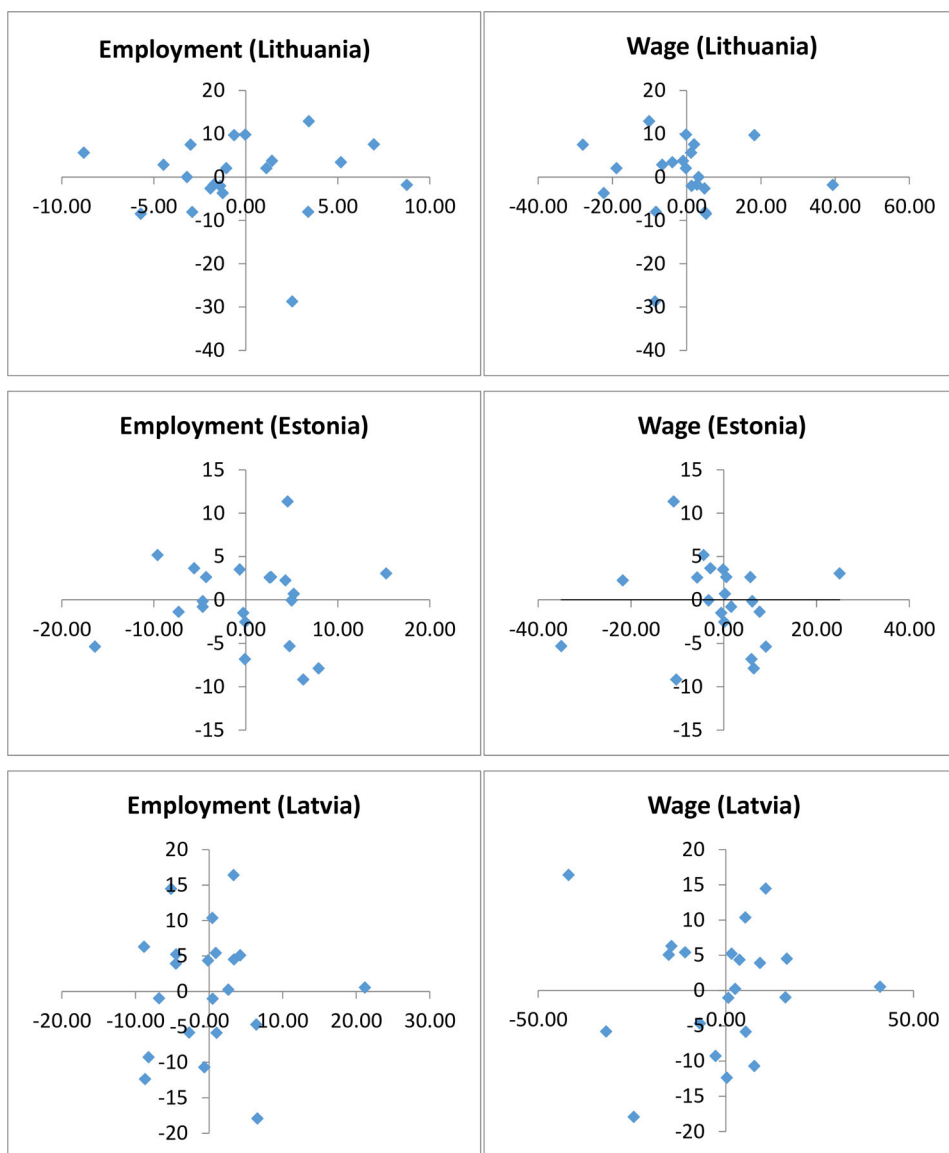


Figure 3. Graphical view of competitiveness and wage and employment (Source: Compiled by the authors based on own calculations and data from the Eurostat (2019)).

Correlation-regression analysis and selection of factors that have the greatest impact on competitiveness revealed that wages, capital, investment and employment have the greatest impact on competitiveness. To clarify their relationship, the Granger causality test was performed, where two hypotheses were tested: main (H0) and alternative (H1).

H0: X is not the cause of Y Granger and the variables are not integrated.

H1: X is the cause of Y Granger and the variables are cointegrated.

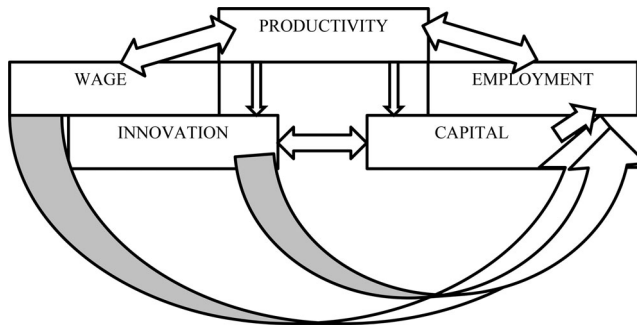


Figure 4. Graphical view of relationships between competitiveness, wages, investments, capital and employment (Source: Compiled by the authors based on own calculations).

The relationship between the above factors was also tested. A graphical view of the connections is presented in Figure 4.

Figure 4 shows that there are interrelationships between the above-mentioned factors. There are links between wages and competitiveness and between investment and capital. Wage growth motivates employees to work more productively and thereby increase competitiveness, while increasing competitiveness promotes business development and consequently the creation of new jobs (employment growth). As a result of higher competitiveness, wages will increase accordingly and this growth will have a positive impact on employment. In turn, increased investment in capital development (and in particular in the application of new technologies to operations) also has a significant impact on employment growth and the proper use of available capital enables the increase of capital investment. It follows that investment also has an indirect effect on employment.

In addition, the results of the Granger causality test confirm the necessity of accepting the H1 hypothesis because the variables are cointegrated and interact with each other for the country's sustainable development and sustainable competitiveness. The exception is employment because the results suggest that competitiveness affects employment (as competitiveness increases, employment is likely to decline as more technology is used and workforce demand decreases), but employment has a very limited impact on competitiveness (And in many cases, almost no effect). There is an only a one-sided relationship between the above factors.

4. Conclusions

1. Competitiveness is a multidimensional category that is one of the main factors influencing the development of a country. The ability to remain competitive and to be more efficient in carrying out the tasks entrusted to it is an essential objective for each country. Linking competitiveness with the surrounding environment, it can be argued that interacting with the social, ecological and economic environment creates the concept of sustainable competitiveness, which is about meeting customer needs without limiting the aspirations of future generations to meet their needs.

2. Evaluating the results of scientific studies, the impact of wages and employment on competitiveness, measured in terms of productivity (expressed as a gross domestic product), is based. Productivity is the key to competitiveness, which defines the efficiency of utilizing the factors of production and translates into the benefits of improving the quality of technological and human resources. It can be argued that suitable innovation use and the use of employee motivation systems are certain prerequisites for the growth of competitiveness and the sustainable development of the country (sustainable competitiveness) as better quality, customer-oriented products are placed on the market, the value of which covers the costs incurred and ensures the necessary profit. The provision of such products ensures the emergence of competitive advantage.
3. Based on the results of theoretical and empirical research, the importance of productivity in relation to competitiveness is based and the ways of measuring productivity are analyzed. For the analysis the period of 1996-2018 is analysed in the case of Baltic states data. Changes in the political (legal), economic, social and technological environment and their impact on competitiveness have also been analyzed and substantiated. This concludes that wage and employment levels, capital levels and volume of investment should form the basis for assessing the impact of the factors determining competitiveness growth.
4. Correlation-regression analysis and Granger causality test results suggest that the wage component has the greatest impact on competitiveness as the material measure is one of the best measures of employee motivation, whereas the employment component identified during the study in the world, competitiveness is achieved only by making efficient use of the resources available, and in particular by applying innovation and modern technology.

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