

ANALYSIS OF THE ECONOMIC PERFORMANCE OF THE COUNTRIES IN EUROPE

Author(s)*: Carmen-Elena STOENOIU ¹, Florica Mioara SERBAN ², Ciprian CRISTEA ³
Position: Lecturer, PhD¹, Assist. Prof., PhD², Assoc. Prof., PhD³
University: Technical University of Cluj-Napoca
Address: Cluj-Napoca, Memorandumului St., No. 28, Romania
Email: Carmen.Stoenoiu@emd.utcluj.ro ¹, Ciprian.Cristea@emd.utcluj.ro ²,
Florica.Serban@emd.utcluj.ro ³
Webpage: <http://www.utcluj.ro/>

Abstract

Purpose – Analyse of indicators to identify the economic performance, obtained by the countries, through economic indicators of economic growth.

Methodology/approach – The comparative and the exploratory analysis to verify the correlation and dependency relationship between the indicators.

Findings – From the comparative analysis we obtained the maximum and minimum levels, as well as information on the average value over the past 9 years. By regression analysis was obtained information about the link that exists between the dependent and independent variables.

Research limitations/implications – From the exploratory analysis it was found that for some indicators the data are correlated by establishing stronger links and for others these links are weak.

Practical implications – The economic performance is given by the level of indicators questioned, which expresses the policies adopted at the level of companies and the population.

Originality/value – The results show that there is a high cost of labour and a high level of public investment in some countries and a high level of taxes and the concern for research and development in an others.

Key words: economic growth, level of development, economic performance.

Introduction

The disparities that exist, from one country to another, is correlate with the modality of using and the level of the developments of the labour force (Hanushek and Kimko, 2000). The studies sustain that most countries that have a GDP per capita acceleration have, experienced, an increase in the use of labour, and those who have suffered a stagnation or decline have experienced a deterioration in their performance relative to growth (Hall and Jones, 1999; Quatraro, 2009). In these countries, the rate of increase in labour productivity could not compensate for the negative contribution from the poor performance related to the use of labour (Iyigun and Owen, 1999; Sianesi and Reenen, 2003).

The importance of sustainable development to ensure competitiveness and growth is discussed by Arrow (1962), Uzawa (1965) and then Nelson and Phelps (1966) that highlights the role of human capital in adopting technologies and its impact on growth. Lucas (1988) and Barro (1991) develops the contribution concept of human capital and demonstrates that this is one of the determinants of per capita income, along with the taxes charged by each country and the standard of living. Krueger and Lindahl (2001) in their work demonstrates the effect of education on economic growth. Many researchers have analysed government spending and their contribution in economy, Barro (1991), Turnovski and Fisher (1995) and Devarajan et al (1996), they establishing the importance of investments for developing for the long terms.

The purpose of this study was to analyse the countries in Europe through six indicators which measure the economic performance. These indicators were selected to identify: the degree of labour force development, the level of fees charged by the state that may influence the standard of living, the concern

for research and development, the investments made by public funds and social welfare, the fiscal burden that is borne by the employees of a country.

Material and Method

For analysis, we used the Eurostat database to collect information for following indicators: Nominal unit labour cost growth (NULCG), Taxes on production and imports less subsidies (TPILS), Research and development expenditure, by sectors of performance (RDESP), Investment by institutional sectors (IIS), Current taxes on income, wealth (CTIW) and Net Social contributions (NSC), from 28 EU countries. Data collection was done March 27, 2019 and with data available for all years of interest (2009-2017) was included in the analysis.

In the first part of the study a comparative analysis of the indicators was carried out by grouping the countries by regions and analysis of each indicator was then carried out based on the average of the nine years studied.

The exploratory analysis used in the second part of the study was conducted using the statistical program (v.8, Stat Soft, USA) using the Tukey test for comparisons between countries taken two in two. The significance threshold was 5%. Simple regression analysis was used because it is a statistical technique that uses the data to estimate interception and to establish the link between the variables taken into the study (addiction and independence). For this, the dependent variable (y) was considered to be the study countries and the independent (x) statistical variables (indicators).

The NULCG indicator is the ratio between labour cost and labour productivity, a composite indicator reflecting any differences between countries in terms of both the values obtained by the numerator (cost of production) and of denominator (labour productivity). NULCG was obtained by through several indicators: Employee compensation in all Industries, Gross Domestic Product, Employees in all industries, and Total employment in all Industries.

TPILS is current unconditional payments to or from the public administration or institutions of the EU that are payable per unit of good or service produced or traded. It is an indicator that reflects the fiscal burden that can be measured at the level of each country and influences the standard of living.

The RDESP reflects spending on research and development, which is considered to be the engine for future development of new knowledge. Includes all R & D expenditure in the enterprise sector (EBRD) over a given period regardless of the source of the funds, which is presented as a percentage of GDP (research and development intensity).

This IIS indicator shows the investments for the total economy, the business environment and the household sector, the share of GDP used for the gross investment. The investments made by both the private sector and the public sector have a multiplier effect and accelerator effect, leading to technological development and ultimately economic growth at national level.

The CTIW covers all mandatory perceived by the public administration and the rest of the world on income and wealth of institutional units and periodic taxes that are not valued on that income or wealth.

The NSC indicator includes the perceived or imputed contributions of households to social security schemes to provide for the payment of social benefits. It is an indicator that reflects the tax burden of each country through social contributions.

Results and discussions

As a result of the comparative analysis carried out by selected the European countries, studied in the regions, obtained the results of Figure 1 (a-d): Northern Europe (NE), Western Europe (WE), Southern Europe (SE), and Eastern Europe (EE).

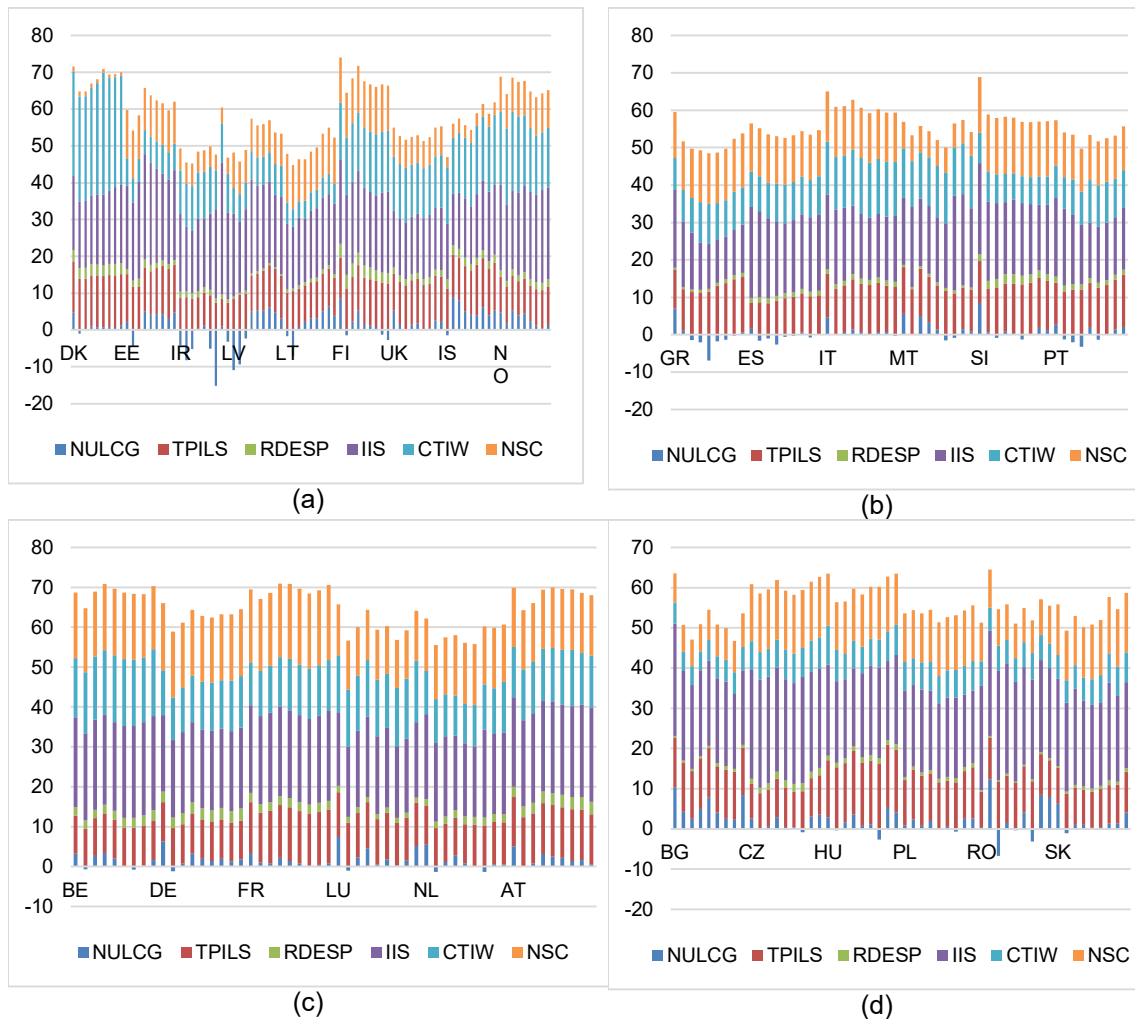


Fig. 1. Indicators evolution by region country: (a) NE, (b) WE, (c) SE, (d) EE

The analysis of Figure 1 (a-d) shows that the highest value of the NULCG indicator, was recorded in the EE region (RO / 2015, BG / 2012, SK / 2012) NE region (IS / 2016, FI / 2012 and EE / 2014), WE region (LU / 2017, FR / 2010, AT / 2012) and SE region (SI / 2013, GR / 2009, MT / 2016). This indicator shows that the lowest level is achieved in the NE and WE regions, where costs are lower than the EE and SE regions, was due either to better use of the workforce due to technology, either because of the existing qualification or the better organization of working time.

The TPILS indicator, recorded the highest values in the EE region (HU / 2013 & 2015, BG / 2011, RO / 2009), followed by the SE region (ES / 2009, SI / 2010, PT / 2012), the NE region (DK / 2009, NO / 2015, IR / 2013) and the WE region (LU / 2009, FR / 2013 & 2016, AT / 2016). This indicator shows that taxes for production are higher in the EE and SE regions in compares of the NE and WE region, the fiscal burden being a brake on development.

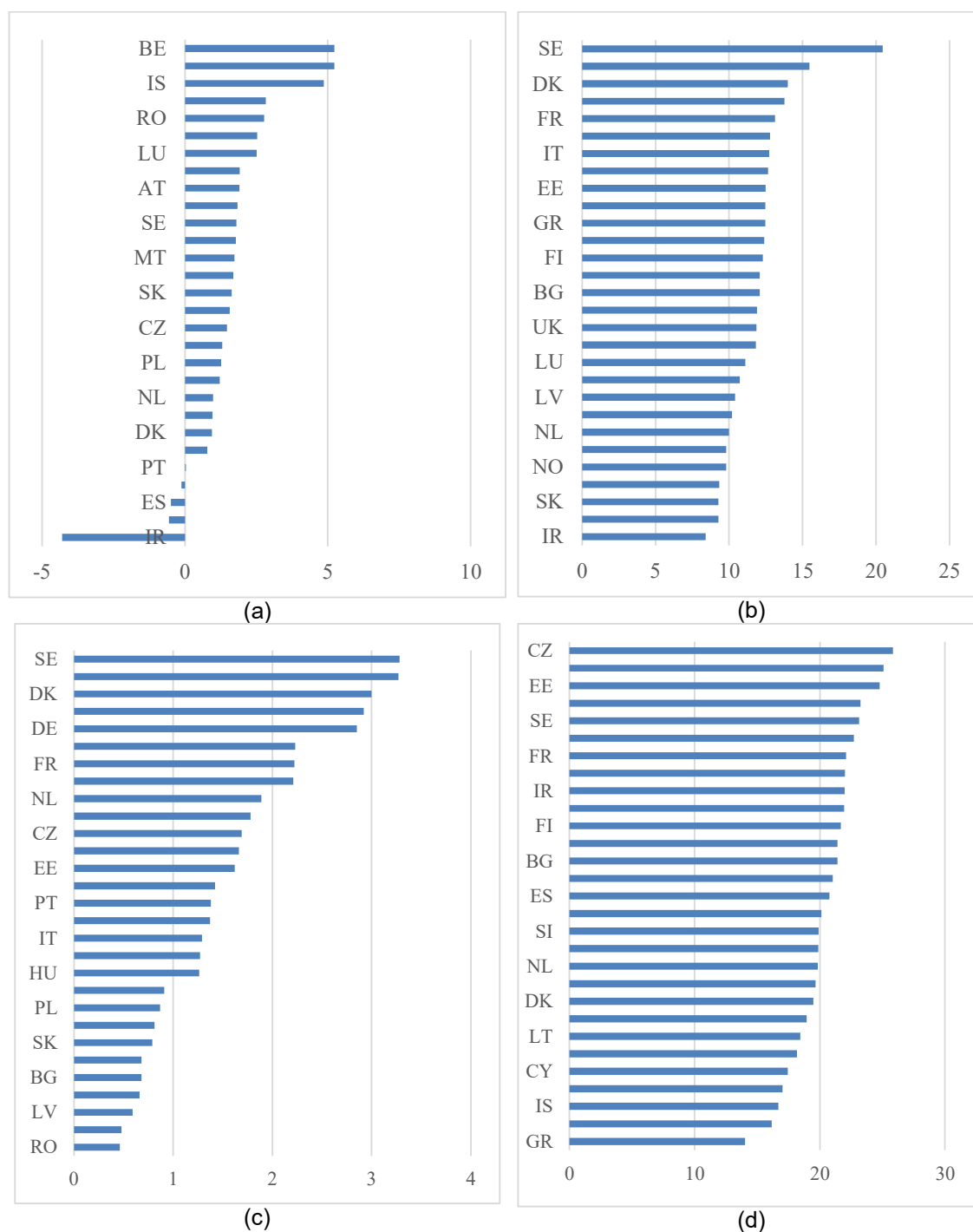
At the RDESP indicator, we notice that the highest values are given by the countries of the WE region (FR / 2014, AT / 2015, DE / 2016) followed by the countries of the NE region (DK / 2012 & 2017, FI / 2012, IS / 2009 & 2016), then SE region (SI / 2014, PT / 2017, IT / 2012, PL / 2016). The results show us that the countries in the WE and NE regions have economic resources that are directed to research and development, which will allow them to continue to be technology promoters.

The IIS indicator, recorded high values in the NE region (LV / 2016, EE / 2012, NO / 2017), followed by the EE region (BG / 2012, RO / 2012, CZ / 2012, the SE region (SI / 2013, ES / 2016, PT / 2017), WE region (AT / 2015, BE / 2009, LU / 2016).

The CTIW, recorded high values in NE regions (DK / 2011, NO / 2009, UK / 2013), followed by the WE region (DE / 2016, NL / AT / 2013), the SE region (IT / 2015, MT / 2014, SI / 2013) and the EE region (HU / 2011, SK / 2017, RO / 2009). This indicator shows that in developed nations in the north, west and south, the income and wealth tax is higher than in the EE region.

The NSC indicator, recorded the highest values in the WE region (FR / 2017, DE / 2017, BE / 2017) followed by the SE region (SI / 2017, 2016 and 2017, IT / 2017), the EE region (CZ / 2017, SK / 2017, PL / 2017) and the NE region (UK / 2016 & 2017, LT / 2017, EE / 2017). The level of social contributions is higher in the WE, SE and NE regions of the EE region.

In Figure 2, the mean values for the 9 years surveyed for six indicators are shown.



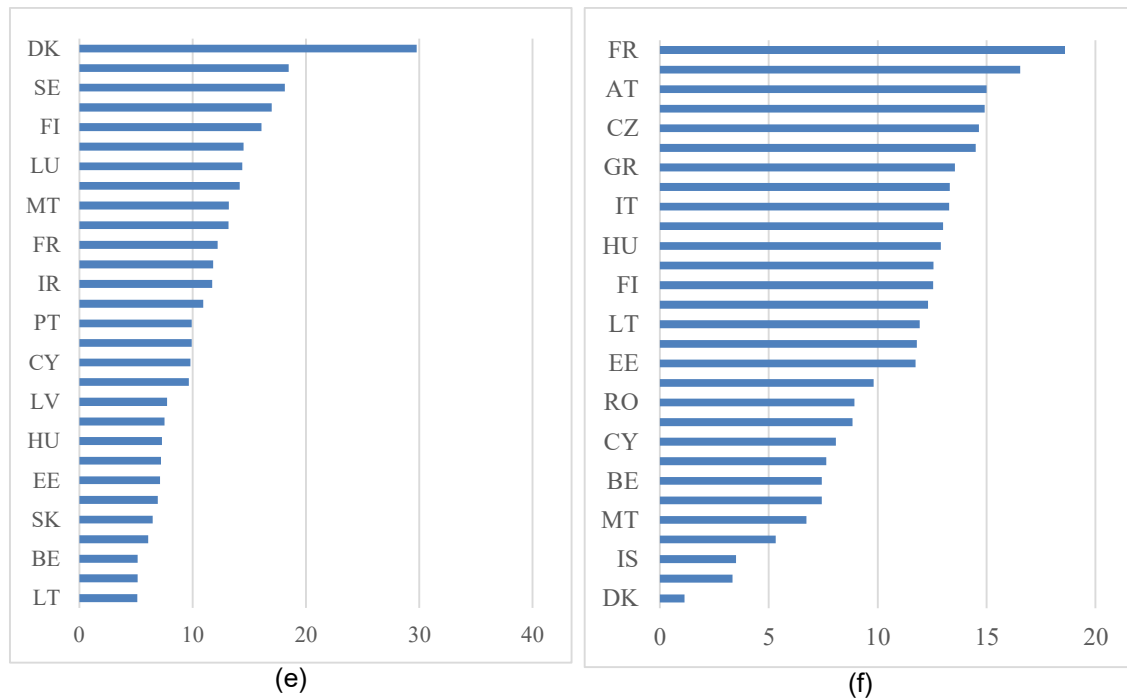


Figure 2. Evolution of indicators according to the average of the years studied: (a) NULCG, (b) TPILS, (c) RDESP, (d) IIS, (e) CTIW, (f) NSC

From Figure 2 (a-f) we can see that for NULCG the highest values are held by the countries: BE (5.23), BG (5.23), IS (4.86), for TPILS, the highest values are registered by the SE, HU (15.46) and DK (14), at the RDESP indicator the highest values are in SE (3.28), FI (3.27), DK (3), RO (25.1) and EE (24.79), the CTIW indicator has the highest values in the countries: DK (29.77), NO (18.48), SE (18.14) FR (18.6), DE (16.54), AT (15).

As expected, significant difference has been observed between investigated indicators (see Table 1).

Table 1. Summary of descriptive statistics

Variable	Valid N	Mean	Minimum	Maximum	Std. Dev.
NULCG	261	1,42797	-15,2000	12,30000	3,298535
TPILS	261	11,81916	6,9000	20,90000	2,414351
RDESP	261	1,62674	0,3800	3,75000	0,863310
IIS	261	20,56383	11,5400	35,74000	3,360183
CTIW	261	11,63678	4,3000	33,20000	5,261678
NSC	261	11,03985	0,9000	19,00000	4,239333

In order to see if there is a relationship between the country (the dependent variable) and the indicators taken in the study (independent variables), the correlation coefficient (R), presented in Table 2, was calculated.

Table 2. Summary Statistics

No.	Variable	Multiple R	Multiple R ²	F	p
1	NULCG	5,03E-01	2,53E-01	2,81E+00	1,20E-05
2	TPILS	9,61E-01	9,23E-01	9,97E+01	0,00E+00
3	RDESP	9,80E-01	9,61E-01	2,04E+02	0,00E+00
4	IIS	8,13E-01	6,61E-01	1,61E+01	0,00E+00
5	CTIW	9,89E-01	9,79E-01	3,77E+02	0,00E+00
6	NSC	9,95E-01	9,89E-01	7,51E+02	0,00E+00

From the analysis of Table 2 it is observed that the value of R is closer to the value 1 for the variables: TPILS, RDESP, IIS, CTIW and NSC, and a small value for NULCG, which shows us that there is a greater correlation for the five variables mentioned (2-6) as compared to the NULCG variable (1). The value of multiply determination coefficient R² shows us that variables (2-6) are largely influenced by the country.

From the post-hoc analysis with the Tukey test, that it can be observed at the level of each indicator taken in the study there is statistically significant differences between pairs of countries but also insignificant statistical differences.

From the probability analysis with the Tukey test – NULCG it can be noticed that there are more statistically insignificant differences than those statistically significant. Thus, statistically significant differences are recorded in the NULCG indicator at the following pairs of countries: IR-BE, IR-BG, IR-DE, IR-EE, ES-BG, LU-IR, HU-IR, MT-IR.

The average value of the NULCG indicator is 1.43, and the countries below the average are: BE, DK, IR, GR, ES, FR, IT, CY, LV, NL, PL, PT, SI.

For TPILS it can be noticed that the insignificant statistical differences are recorded in the following countries: CZ-BE, DE-BE, DE-CZ, EE-BG, GR-EE, ES-BE, ES-EN, ES-DE, ES-IR, FR-FR, CY-DK, CY-FR, CY-IT, LV-BE, LU-CZ, LU-DE, LV-ES, LT-LU-LT, LU-LT, LU-LT, HU-GR, MT-LT, MT-EE, MT-LT, MT-IT.

The average value of the TPILS indicator is 11.82, and the countries below the average are: BE, CZ, DE, IR, ES, LV, LT, LU, NL, RO, SK, NO.

For RDESP it can be noticed that statistically in-significant differences were recorded in the following pairs of countries: DE-DK, EE-CZ, IR-CZ, IR-EE, GR-FR-BE, IT-IR, IT-ES, CY-BG, LU-BG, LV-GR, LV-CY, LT-ES, LU-IT, HU-IR, HU-ES, HU-IT, HU-LU, MT-EN-PL, CZ-NL, CZ-PT, CZ-UK, CZ-NO, DK-AT, DK-FI, PT, EE-UK, EE-NO, IR-PT, IR UK, GR-PL, GR-SK, LV-PL, LV-RO, LT-SK, LU-PT, LU-UK, HU-PT, MT-UK, NL-NO, PL-SK, PT-UK, SI-IS, FI-SE, UK-NO.

The average value of the RDESP indicator is 1.62, and the countries below the mean value are: BG, EE, IR, GR, ES, IT, CY, LV, LU, HU, MT, PL, that is, countries that have a lower than average R & D expenditure ratio.

For IIS, there are statistically significant differences in the following pairs of countries: CZ-BG, DK-CZ, DE-CZ, EE-DK, EE-DE, IR-CZ, GR-BE, GR-BG, GR-CZ, GR-DK, GR-DE, GR-EE, GR-IR, ES-CZ, ES-EE, ES-GR, IT-BE, IT-CZ, IT-EE, IT-IR, IT-GR, IT-FR, CY-BE, CY-BG, CY-CZ, CY-EE, CY-IR, CY-FR, LU-CZ, LV-IT, LT-BE, LT-EN, LT-EE, LT-GR, LT-FR, LU-BE, LU-CZ, LU-EE, HU-EE, HU-GR, MT-CZ, MT-EE, MT-GR, BE-PT, BE-UK, BE-IS, BG-PT, BG-UK, BG-IS, CZ-NL, CZ-PL, CZ, BE-UK, BE-IS, BG-PT, BG-UK, BG-IS, CZ-NL, CZ-PL, CZ-PT, CZ-FI, CZ-UK, CZ-IS, DK-SE, DK-NO, DE-UK, EE-NL, EE-PT, EE-UK, EE-IS, IR-PT, SI, GR-SE, GR-FI, ES-PT, ES-RO, ES-UK, ES-IS, FR-IT-RO, IT-SK, IT-SE, IT-NO, CY-AT, CY-RO, CY-SK, IS-LT, LT-AT, LT-RO, LT-SE, LTU, LU-AT, LU-RO, HU-MT-RO, MT-UK, NL-RO, NL-UK, AT-PT, PT-NO, RO-SI, RO-UK, SI-UK, SK-UK, SK-IS, FI-UK, FI-IS, SE-UK, SE-IS, UK-NO, IS-NO.

The average value of the IIS indicator is 20.56 and the countries below the mean are: DK, DE, GR, IT, CY, LT, LU, MT, NL, PL, PT, SI, UK, IS.

For CTIW, there are statistically significant differences in the following pairs: EE-CZ, IR-DE, ES-GR, FR-DE, CY,-GR, CY-ES, LV-CZ, LT, BG, LU-IT, HU-CZ, HU-EE, HU-LV, MT-DE, MT-FR, MT-LV, BE-FI, BE-IS, BG-RO, BG-SK, CZ-PL, CZ-RO, CZ-SI, CZ-SK, DE-NL, DE-AT, EE-PL, EE-RO, EE-SI, EE-SK, IR-NL, IR-AT, GR-NL, GR-PT, ES-NL, ES-PT, FR-NL, FR-AT, IT-AT, IT-UK, CY-NL, CY-PT, LV-PL, LV-SI, LV-SK, LT-RO, LT-SK, LU-AT, LU-UK, HU-PL, HU-RO, HU-SI, HU-SK, MT-AT, MT-UK, NL-PT, AT-UK, PL-RO, PL-SI, PL-SK, RO-SK, SI-SK, FI-IS, SE-IS, SE-NO.

The average value of the CTIW indicator is 11.64, and the countries below the average are: BE, BG, CZ, EE, GR, ES, CY, LT, HU, NL, PL, PT, RO, SI, SK.

For NSC it can be observed that there are statistically insignificant statistical differences in the following pairs of countries: DE-BE, ES-EE, IT-GR, IT-ES, CY-BG, LU-CY, LT, LT-ES, LU-EE, LU-ES, LU-LT, HU-GR, HU-ES, HU-IT, HU-LU, MT-BG, CZ-NL -PL, GR-SK, ES-PL, ES-PT, ES-SK, ES-FI, IT-PL, IT-SK, IT, FI, CY-UK, LV-RO, LT-PT, LT, LU-PL, LU-PT, LU-FI, HU-PL, HU-SK, HU-FI, NL-AT, NL-SI, AT-SI, PL-SK, PL-FI, PT-FI, SK -FI, HU-FI, NL-AT, NL-SI, AT-SI, PL-SK, PL-FI, PT-FI, SK-FI, SE-IS.

The average value of the NSC indicator is 11.04, and the countries below the mean are: BG, DK, IR, CY, LV, MT, RO, SE, UK, IS, NO.

Conclusion

From the comparative analysis it was found that the maximum levels of the indicators for the countries under study appeared in different years, the year being not a reference for all countries and neither for everyone indicators. At the NSC indicator, in the year 2017, was the highest level of social contributions (9 countries out of 12). The RDESP indicator show as that countries in WE, NE and SE regions spent more research money than those in EE region. From the average analysis for the 9 years studied, it is found that the maximum values for the NULCG indicator are recorded by countries: BE, BG and IS. At the TPILS indicator the performance are recorded by countries: SE, HU and DK, and the RDESP indicator: SE, FI, and DK. To the IIS indicator the performance are recorded by countries: CZ, RO, EE, the CTIW indicator: DK, NO and SE and at the NSC indicator: FR, DE and AT. Taking into account the maximum values of each indicator from the 28 analysed countries, RO obtained the following classification: NULCG (5), TPILS (20), RDESP (29), IIS (2), CTIW (26), and NSC (19).

Thus, it can be concluded that the economic performance of the countries in Europe is given by the country's ability to sustain certain expenditures at the economic agent level, at the state level and at the level of the population which is able to bear the taxes and social contributions imposed. The highest recorded level, we find that is: a high labour cost in countries like BE, a high level of taxes that are perceived by the state as a result of traded goods that may affect living standards in countries such as the SE, the concern for future development of firms through R & D spending in SE, a high level of the investments made from public funds with long-term beneficial effects in: CZ, a higher tax burden in: DK and FR.

From the exploratory analysis using ad hoc analysis, it was found that for the NSC, CTIW, RDESP and TPILS indicators there is a stronger link and for the IIS and NULCG indicators this link and correlation relationship is lower.

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