THE INFLUENCE OF THE GDP CONVERSION RATE INTO GNI ON SOCIAL PROGRESS. COMPARATIVE ANALYSIS AT THE EU LEVEL

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Abstract

Gross Domestic Product per capita is one of the main and indispensable indicators around which official reports are built representing thusthe comparative macroeconomic outcomes across states, being considered also a benchmark for national wealth analysis and comparison.

However, reality has shown that this results indicator, although one of the most popular and publicized macroeconomic variable, does not reflect a real and complete perspective on the economic and social situation of the citizens of the analyzed country. Proof of the viability of this outlook lies with the World Bank using GNI per capita in order to achieve annual hierarchization of savings in four groups (high income countries, upper middle-income countries, lower middle-income countries and lower income countries). This criterion was also adopted with the European Community in order to establish for each Member State the contribution to the Community's budget as well as the contribution from VAT.

Starting from these points of view and taking into account that, regardless of the level at which the economic activity takes place, the final goal must be the same - the satisfaction of the human needs in rational conditions - the present paper has two objectives: first to analyze comparatively , for the EU Member States, the share of GDP in GDP (per capita) and, secondly, to verify using empirical data the link between the rate of conversion and the social progress of these states. As a variable for measuring the quality of life, the reporting shall be made according to the Social Progress Index. This is because, in order to achieve the economic and social development objectives, financial resources are determinant but not enough - the human resources (and, implicitly, the educational system), the material and informative, along with qualitative aspects such as ethics and equity in the distribution of income represent also indispensable premises.

Keywords: *gross domestic product, gross national income, social progress index, conversion rate, comparative analysis*

1. Introduction

Achieving the optimal level of macroeconomic outcomes is the primary objective and decision-maker's resolution, and the level reached, a barometer of confidence in the national economy, for both civil societies, the business environment, the rating institutions and international institutions.

From the broad range of these indicators, GDP per capita represents the most publicized and widespread variable in official reports on the evolution of national economies.

However, considering that it is an exclusive indicator of results, reflecting the economic activity from the point of view of the value added within the national economies (with indisputable implications on the level of employment, evolution of the inflation rate, budgetary revenues), it expresses only the economic power of the country, without providing sufficient information regarding the economic power of national economic agents.

Under these circumstances, gross national income per capita has been imposed internationally, being increasingly used, especially in the context of economic and social globalization, an irreversible process that makes the distinction between local and national more and more visible. Proof of the relevance of this indicator is also the annual World Bank hierarchy of the world's economies, which divides the states into four groups, according to GNI per capita (high income countries, upper middle-income countries, low income countries and countries with lower incomes). This criterion was also adopted at the level of the European Community in order to establish for each Member State the contribution to the Community budget as well as the contribution from VAT.

Moreover, since the interest for personal progress has passed the individual boundaries, becoming an objective of the national and international development strategies, the focus has been on theconversionrate of the domestic results into national incomes, as well as to the extent to which this aspect puts animprint on the quality of life of the citizens, becoming thus a topic of intrigue, both from the theoretical and practical perspective.

In fact, the desire to balance the three directions affecting the individuals' quality of life (economy, society and the environment) has "overthrown" the economy, generating increased attention and commensuration of the other two segments, which resulted in the construction of new indicators, relevant from the point of view of the environment and social welfare.

Thus, if, from the macroeconomic outlook, the degree of GDP conversion into GNI reflects the extent to which the economic strength of the country is transferred to the material prosperity of its citizens,

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information on social welfare and environmental quality is synthesized and expressed using new indicators of social progress assessment - Social Progress Index, Prosperity Index, Genuine Progress Indicator, Life Quality Index, and so on.

The analysis of the interdependence between these three essential aspects of human life (economic, social and environmental), with direct and immediate implications on the quality of life, is also the subject of the present research paper, with the purpose to determine, on the basis of empirical data, members of the European Union (with a distinct analysis on Romania) can be established a general relation - valid between the rate of GDP conversion into GNI and the overall progress of the society.

Drawing a conclusion in this respect will allow emphasizing the role other factors have on the progress and the society's wellbeing, and most importantly the identification of the ways in which these complementary factors, which are considered to be secondary, can be improved so that the premises for the effective improvement of the quality of human life on all its levels are created.

This is because, one thing is certain - income is a determining, important but insufficient factor. The interest center needs to be moved from how much we invest to what we invest and, above all, on qualitative results.

In fact, this goal was materialized in 2015 in a new Global Action Program, formulated as "Agenda 2030 for Sustainable Development" and adopted by all 193 United Nations member states that set out a plan so that, by 2030, extreme poverty, inequality and injustice are eradicated, while pursuing the protection of the planet (17 global sustainable development objectives).

2. Brief presentation of the methodology

A first step towards achieving the research's objective is to determine the rate of GDP conversion into GNP. In order to allow comparability of the results, the reporting is made at GDP / capita and GNI / capita, both expressed in $, at purchasing power parity. The empirical analysis targets data published by the World Bank for 2017 (currently the most recent definitive data) for the European Union member states.

As a variable for measuring the quality of life, the reporting shall be made according to the Social Progress Index. This option is based on two objective aspects[1]:

- considering that the computing method relates to three essential aspects for determining social well-being and quality of life in general: the degree of satisfaction of basic human needs (food, medical care, water and sanitation, housing, personal safety), access to fundamental well-being (access to basic education, access to communications and information, health and well-being, environmental quality) and the opportunities created (personal rights, personal freedom and freedom of choice, inclusion, access to advanced education), the indicator only commensurate with information about others two factors of interest in this paper, namely society and the environment;
- taking into account the four fundamental principles according to which it was built (excluding social and environmental indicators, attention focused on inputs not on inputs, holistic and relevant for all countries, applicability[2]), since 2014 when the nonprofit organization Social Progress Imperative, with Deloitte's support, publishes annually a Social Progress Index report for 146 countries, it has become one of the most widely used and cited sources of documentation in specialized studies.

Considering that the fundamentals of economic theory suggest a positive correlation between the conversion rate of GDP / capita into GDP / capita and Social Progress Index, the analysis of the relationship between the two variables involves firstly establishing of a link but also determining the intensity and the meaning of this link. To this end, the Data Analysis function is used in the Excel spreadsheet program because it provides the value of the linear correlation coefficient r. Thus, a positive value of the correlation coefficient reflects a direct correlation between the two indices, and a negative value indicates a relationship reverse in terms of their evolution.

Considering that in order to establish the correlation intensity, although there is no unitary approach, the references are made predominantly to the interpretation proposed by Professor Will G. Hopkins in 2000 for the interpretation of the correlation coefficient r we will consider the intervals set by it, thus[3]:

- between 0.0 and 0.1 - negligible correlation between variables;
- between 0.1 and 0.3 - minor correlation;
- between 0.3 and 0.5 - moderate moderate correlation;
- between 0.5 and 0.7 - high correlation;
- between 0.7 and 0.9 - very high correlation;
- between 0.9 and 1.0 - almost perfect correlation.

A first analysis of the correlation between GDP / capita GDP / capita GDP and the Social Progress Index was made for all EU member states, but the uneven distribution of data, the Pearson correlation coefficient of minor value (-0.12933) and the significance threshold greater than 0.05 reveals that there is no linear relationship between the two indicators. This aspect makes the analysis of the graphical representation of the linear function and of the determination coefficient (R2) not statistically relevant.

However, the absence of a linear link does not rule out any link between the analyzed variables.

[1] Michael E. Porter, Scott Stern, Michael Green (2017), *Social Progress Index 2017*, Washington, Social Progress Imperative, p. 3
[2] Idem, p. 2
[33] Gabriel SticlaruStastistical Applications with SPI, EdituraCoolPrint, Bucharest, 2012, pp. 50-52

Therefore, further analysis is justified to identify another type of correlation. In this sense, the EU countries are grouped into two categories - countries with a GDP conversion rate in GNI of over 100% and countries where the conversion rate is below 100%.

As far as Romania is concerned, since the Report on the Social Progress Index was published in 2014, the retrospective analysis of the correlation between the two variables is limited to the period 2014-2017 and the GDP / capita and GNI / capita are also expressed, in $, to purchasing power parity.

3. GDP conversion rate in GNI versus the Social Progress Index

3.1. Comparative analysis across EU countries Content

Grouping of EU countries according to the macroeconomic indicator of dominant output (GNI or GDP) also illustrates an uneven distribution of data as shown in Tables 1 and 2. According to the same data, the distribution is uneven, including from the perspective of correlating the position in countries' rankings according to GDP / capita with the position regarding the conversion rate or the IPS level.

Table no. 1 Turnover rate of GDP / capita in HNI / capita vs SPI for EU member countries with a conversion rate higher than 100%

Rank* (according to GDP/capita)	Country	GNI/GDP %	SPI %
4	Austria	100.20	87.98
5	Denmark	102.00	90.57
6	Germany	102.06	88.5
7	Sweden	101.54	89.66
8	Belgium	100.84	87.15
9	Finland	101.19	90.53
11	France	102.19	85.92
13	Italy	100.54	82.62
25	Greece	100.07	78.92
28	Bulgaria	101.30	74.42

Source: author's work based on World Development Indicators data, last updated date 3/21/2019

*Malta is missing because it is not included in the Social Progress Index 2017

Table no. 2 GDP conversion rate in GNI vs SPI for EU member countries with a conversion rate of less than 100%

Rank (according to GDP/capita)	Country	GNI/GDP %	SPI %
1	Luxembourg	70.07	89.27
2	Ireland	81.84	88.91
3	Netherlands	99.42	89.82
10	UK	98.36	88.73
14	Spain	99.98	86.96
15	Czech Republic	94.83	84.22
16	Slovenia	97.45	84.32
17	Cyprus	97.41	81.15
18	Lithuania	96.70	78.09
19	Estonia	97.98	82.96
20	Portugal	97.81	85.44
21	Slovak Republic	97.67	80.22
22	Poland	96.04	79.65
23	Latvia	99.26	78.61
24	Hungary	95.92	77.32
26	Romania	97.31	73.53
27	Croatia	98.18	78.04

Source: author's work based on World Development Indicators data, last updated date 3/21/2019

Although for both groups, the Pearson correlation coefficient reflects an average correlation between the variables analyzed (Table 3 and Table 4), the significance threshold of more than 0.05 indicates that there is no linear relationship between the two indicators.

Moreover, the graphical representation of the scatter plot of the two variables values in each of the two groups of countries reflects the existence of a polynomial trend, but of a low intensity (R2 = 29, 8% for the countries with a conversion rate over 1 and R2 = 42% for countries with conversion rate below 1). It should be taken into account that in the case of nonlinear correlations the coefficient R2 no longer reflects the degree of determination but only the intensity of the analyzed trend.

Table no. 3 Correlation coefficient between the GDP conversion rate in GNI and SPI for EU member countries with a conversion rate higher than 100%

	Column 1	Column 2
Column 1	1	
Column 2	0.36387	1

Source: author's work based on data in table no. 1

Table no. 4 Correlation coefficient between the GDP conversion rate in GNI and SPI for EU member countries with a conversion rate of less than 100%

	Column 1	Column 2
Column 1	1	
Column 2	- 0.40009	1

Source: author's work based on data in table no.2

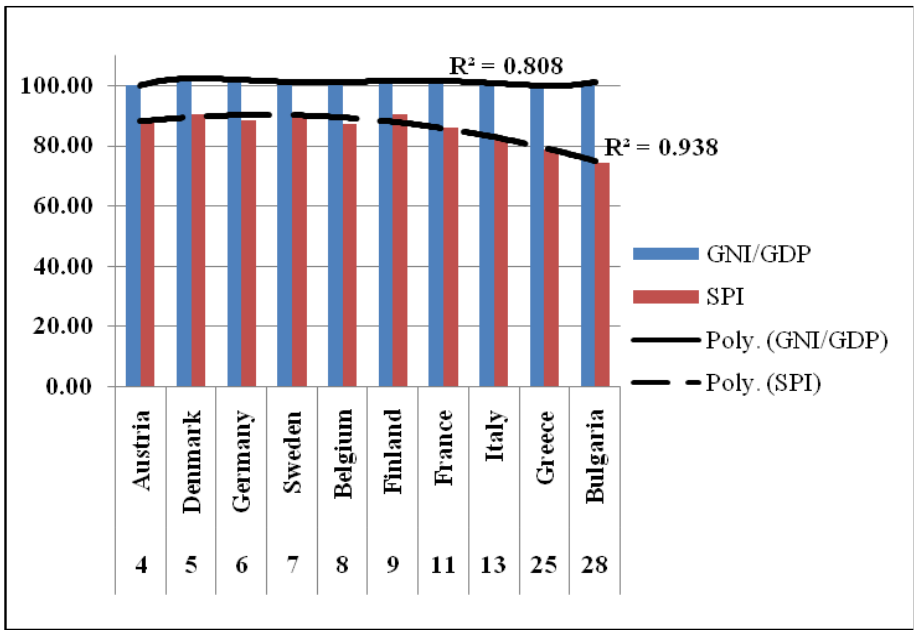
We observe that in countries with a conversion rate higher than 100%, the fact that the national per capita income is higher than the GDP / capitaput their mark, in positive but moderate way (r = 0.36387) on the social progress – the countries with the highestconversion rate in this group also records also the highest level of the social progress index.

In the case of countries with a conversion rate of less than 100%, a national income per capita lower than GDP / capita also influences moderately but in the negative (-0.40009), the level of social progress index - in this group, the social progress index is higher for countries with the smallest conversion rate.

Taking into account the identified restrictions, the analysis of the link between the GDP share in GDP and the degree of social progress will be limited to graphical comparison through column type charts and the identification of a trend of the two variables, depending on the position of the countries in the EU GDP classification / capita.

As a consequence, Chart 1 illustrates comparatively the GDP / capita GDP conversion rate and the Social Progress Index for EU countries where national / capita income is higher than GDP / capita. In this case, the rate of conversion is higher and, although it does not fluctuate much (maximum 2 percentage points), the distance between the two variables increases as GDP / capita decreases.

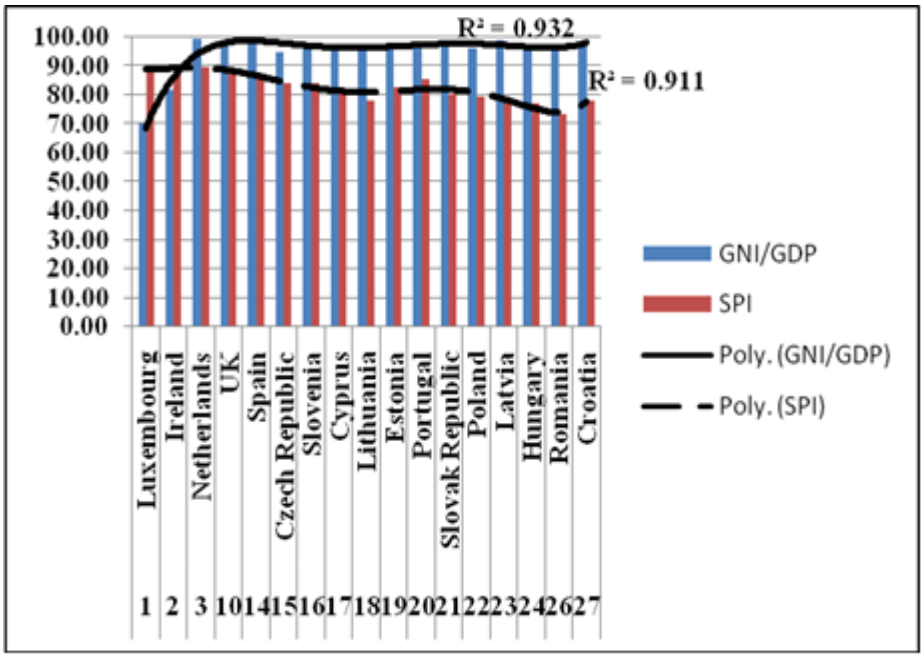
Chart no. 1 GDP conversion rate into GNI vs SPI for EU member countries with a conversion rate higher than 100%



Source: author's work based on the data in table no. 1

The situation is not much different for the second category of countries, i.e. those for which the rate of conversion is less than one, as suggestively illustrates graph no. 2.

Chart no. 2 GDP conversion rate in GNI vs SPI for EU member countries with a conversion rate of less than 100%



Source: author's work based on the data in table no. 2

Thus, the smallest conversion rates (70.07% and 81.84%, registered by Luxembourg and Ireland, the first two countries in the GDP / capita ranking), ensure the highest levels of social progress but by passing between the 95% - 99, 8% (which includes the rest of 15countries within the group), as GDP / capita decreases, decreases on average the level of registered social progress, and the gap between the two variables can be seen on the graph.

3.2. Retrospective analysis for Romania

Empirical data and graphical representations for both groups of countries analyzed reflect the direct, positive link between the level of social progress and GDP / capita and also the moderate correlation between the social progress index and the GDP conversion rate in the GNI, situation confirmed by the figures shown for Romania and summarizedin table no. 5.

Table no. 5 GDP conversion rate in GNI vs SPI in Romania

AN	2009	2010	2011	2012	2013	2014	2015	2016	2017
GNI/GDP%	98.7	98.49	98.34	98.25	97.84	98.72	97.68	97.37	97.31
SPI%	-	-	-	-	-	67.72	68.37	72.23	73.53

Source: author's work based on World Development Indicators, last update date 3/21/2019 and Social Progress Index, 2017 Report

The limited time horizon for which the data is available, makes an analysis of the correlation between the two variables unviable, but it is worth noting that the value of the Pearson correlation coefficient is also negative for Romania, which corresponds to the general trend determined in the countries of its group (Table 6).

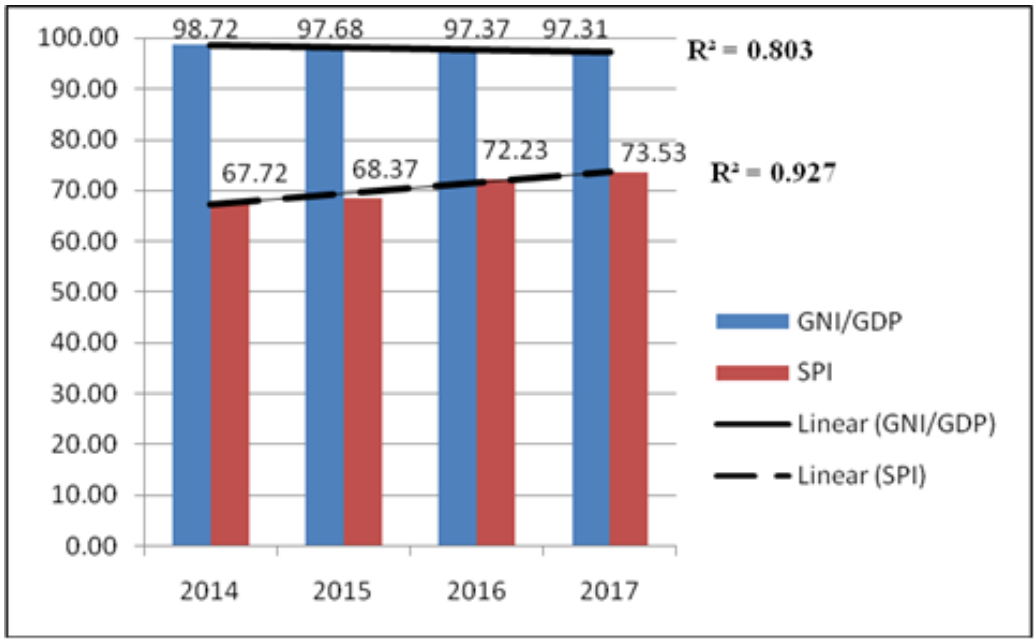
Thus, as illustrated in Chart no. 3, although the conversion rate has decreased during the analyzed period, the social progress index has increased, strengthening the idea that GDP / capita puts its mark on the evolution of the quality of social life.

Tabel nr. 6 Correlation coefficient between the rate of GDP conversion into GNI and SPI in Romania

	Column 1	Column 2
Column 1	1	
Column 2	- 0.81003	1

Source:the author's work based on the data in table no. 5

Grafic nr. 3 GDP conversion rate in GNI vs SPI in Romania



Source: the author's work based on the data in table no. 5

So, although it is highly discussed and disputed, the relevance of GDP / capita, in the analyzes and reports regarding the standard of living and quality of life in the world states, it proves to be an indispensable but not sufficient source of information.

4. Conclusions

If traditionally, the economic theory focuseses on GDP / capita to analyze and compare the standard of living for the world's states, in the last years it has been noted that particular attention is paid to GNI / capita as a benchmark for countries ranking for the same purpose. This is because it has been found that circumstantial situations can facilitate the increase of the value of the domestic final output, without this favorable situation being transferred to the national economic agents. Moreover, worries about climate change, increasing conflicts and social discrepancies have generated interest for other indicators of measuring the quality of life, social implications gaining priority over the economic ones.

In the light of the foregoing, the present paper has been built on the premise that an empirical analysis at the level of the EU Member States will support these new approaches.

However, reality has shown that the normative approach is not complementary to the positive one, and no clear relationship can be established, generally valid between the degree to which GDP is conversioned into national income and social progress. Furthermore, graphical representations show the same evolution of social progress and GDP / capita.

The moderate correlation level between the GDP conversion rate into GNI and IPS and the declining trend of the social progress along with the country's GDP / capita decline, demonstrate that the macroeconomic outcome indicators remain pillars of the quality of life for citizens of the national states but , lead at the same time to a clear conclusion: factors outside the exclusively economic sphere activities such as politics, education, economic and entrepreneurial culture of the population, traditions, but above all the public administration decision-makers abilities to manage their national wealth, leave a mark to an even greater extent than the macroeconomic results on the standard of living.

As a result, alongside the media coverage of all macroeconomic outputs, the popularization of complementary indicators such as the Social Progress Index would lead to an increase in the level of information and, implicitly, an increaseof the expectations and involvement of civil society as a stakeholder of national economies.

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