

GLOBAL COMPETITIVENESS IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT: THE ROMANIAN CASE

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Abstract: In an increasingly open and integrated world economy, competitiveness and sustainability have become a central preoccupation of both advanced and emerging countries. Thus, the goal of this paper is to research the interconnection between the competitiveness and sustainable development factors, based on the development of the concepts and current research tendencies. Using extensive data over a period of 10 years, this study explores and tests the sign of the relationship between national competitiveness and sustainable development indicators. Our findings are the basis of developing new models describing the relationships between competitiveness, economic growth and sustainability, justified by the need of sustainable economy's development to increase the national competitiveness, in order to attract financial resources necessary for financing the growth of the economy and economic entities.

JEL classification: M21, O11, 57

Key words: competitiveness; sustainable development, indicators; sustainable competitiveness; global competitiveness index.

1. INTRODUCTION

In today's uncertain climate, competitiveness has become a milestone of both advanced and emerging countries.

Based on the most recent studies in this research field, the concept of competitiveness (at the national level) can be defined as the set of institutions, policies and factors that determine the level of productivity of a country (Sala-I-Martin et. al, 2008).

Competitiveness generates challenges for the countries by creating financial and nonfinancial performance for companies, welfare for citizens and sustainable prosperity for the economy. In this regard, competitiveness has become a goal for economies in their flounder for achieving a high level of performance. The European Commission has shown increasing interest in the issue of sustainable development, not only in the context of environmental policies but, more recently, in the context of all policy decisions, be they economic, social or environmental. In this sense, competitiveness represents a key issue in the context of knowledge based economy and considering the need to identify competitive factors that are the basis of European policies' design.

This creates a need for research initiatives to develop the concept of competitiveness, with much of the research focusing on how sustainable development and competitiveness interact (Balkyte & Tvaronavičiene, 2010; Gligor, 2014).

Based on this approach, our research is focused on analyzing the relationship between the national competitiveness in Romania (calculated as the global index of competitiveness developed by the World Economic Forum) and the most relevant indicators of sustainable development, taking into account previous national and international studies and their results, using econometric modeling on data during a period of 10 years (2004 -2013). We started with an analysis of the competitiveness and sustainable development theoretical concept tendencies, taking into the account the existing literature and the most recent studies, with a specific focus on competitiveness in the context of sustainable development (section 2). Section 3 presents the conceptual model and hypotheses; section 4 analyzes the current methodological approaches and their results and finally, in section 5 are presented the conclusions, which may contribute for further research.

2. LITERATURE REVIEW

In today's climate, competitiveness and sustainability have become catch words in the discourse on global prosperity and development strategies.

The definition and measurement of competitiveness is thus an important issue for policy-makers. Edmonds (2000) defines competitiveness from a firm's point of view as the ability to produce the right goods and services of the right quality at the right price, at the right time, thus meeting customers' needs more efficiently and more effectively than other firms do. National competitiveness refers to a country's ability to create, produce, distribute and service products in the international trade while earning rising returns on its resources (Arslan & Tathdil, 2012). Hickman (1992) defines international competitiveness as "the ability to sustain, in a global economy, an acceptable growth in the real standard of living of the population with an acceptably fair distribution, while efficiently providing employment for substantially all who can and wish to work and doing so without reducing the growth potential in the standards of living of future generations".

For the last quarter-century, the World Economic Forum has led in the evaluation of the nation's competitiveness its publication - The Global Competitiveness Report (WEF, 2005). The WEF uses three competitiveness indicators to analyze national competitiveness from both macro- and microeconomic perspectives. The Growth Competitiveness Index (GCI), developed by McArthur and Sachs (2001) and Blanke and Lopez-Claros (2004) develops an evaluation based on critical, and mostly macroeconomic environmental, factors that influence sustained economic growth over the medium-to-long term. Business Competitiveness Index (BCI) developed by Porter (1990) investigates those company-specific factors that lead to improved efficiency and productivity indicators at the micro-level, and is complementary to the GCI. Recently, GloCI (2004) was developed, a synthesis of the GCI and BCI. This new index is designed to unify the two earlier measures, and, eventually, to replace them in The Global Competitiveness Report.

The measurement of GloCI is captured by including a weighted average of many different components, each measuring a different aspect of competitiveness. These components are grouped into 12 pillars of economic competitiveness. The GloCI takes into account the stages of development by attributing higher relative weights to those pillars that are more relevant for an economy given its particular stage of development.

Although all 12 pillars matter to a certain extent for all countries, the relative importance of each one depends on a country's particular stage of development. To implement this concept, the pillars are organized into three subindexes, each critical to a particular stage of development. The basic requirements subindex groups those pillars most critical for countries in the factor-driven stage (institutions, infrastructure, macroeconomic environment, health and primary education). The efficiency enhancer's subindex includes those pillars critical for countries in the efficiency-driven stage (higher education and training, good market efficiency, labor market efficiency, financial market development, technological readiness). The innovation and sophistication factors subindex include the pillars critical to countries in the innovation-driven stage (market size, business sophistication, innovation).

The relationship between the two concepts, competitiveness and sustainability has been studied extensively by academics, policy practitioners and international organizations. In the context of population and consumption of natural resources growth, sustainable development is a development model aimed at a balance between economic growth, quality of life and environmental preservation in the medium and long term, without increasing consumption of natural resources beyond the capacity of the Earth. A distinctive feature of the European model of development is represented by the junction between the objective of increasing competitiveness and social and environmental objectives, which leads to deeper relationships between sustainable development and competitiveness.

Over the past few decades, the interest has increased mainly as a consequence of influential public works, the most popular document being the report *Our Common Future* (1987) which defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." (Brundtland & WCED, 1987).

Despite mounting interest in sustainable development, the relationship between sustainability and competitiveness has been only marginally explored. So far, economists have devoted their efforts to trying to understand the way economic growth impacts the quality of the environment or income distribution within a country and vice versa. However, little is known about how these aspects of sustainability relate to competitiveness. Feurer and Chaharbaghi (1994) have proposed a holistic definition of competitiveness, taking into account the sustainability: "Competitiveness is relative and not absolute. It depends on shareholder and customer values, financial strength which determines the ability to act and react within the competitive environment and the potential of people and technology in implementing the necessary strategic changes.

The strategy Europe 2020 hints that EU member states should regard environmental challenges as growth opportunities, thus using efficiently their natural resources towards economic growth. It is a known fact that all of an economy's sectors can contribute to smart growth through using new technologies for innovations. Also, researchers are preoccupied with identifying specific future sustainable competitiveness drivers.

The Sustainable Development Indicators (SDIs) are used to monitor the EU Sustainable Development Strategy (EU SDS) in a report published by Eurostat every two years as shown in table 1. Of more than 100 indicators, twelve have been identified as headline indicators. They are intended to give an overall picture of whether the European Union has achieved progress towards sustainable development in terms of the objectives and targets defined in the strategy.

Table no. 1. Headline indicators of sustainable development

Indicators of sustainable development	Headline indicator
Socioeconomic development	Real GDP per capita, growth rate and totals
Sustainable consumption and production	Resource productivity
Social inclusion	People at-risk-of-poverty or social exclusion
Demographic changes	Employment rate of older workers
Public health	Healthy life years and life expectancy at birth, by sex
Climate change and charge	Greenhouse gas emissions
	Share of renewables in gross final energy consumption
	Primary energy consumption
Sustainable transport	Energy consumption of transport relative to GDP
Natural resources	Common bird index
Global partnership	Official development assistance as share of gross national income
Good governance	Good governance

Source: adapted from <http://ec.europa.eu/eurostat/web/sdi/indicators>

It can be concluded that globalization, social progress, sustainability and competitiveness are interlinked with different types of competitive advantages that interact and reinforce each other.

3. RESEARCH FRAMEWORK AND HYPOTHESES

In order to determine if there is a relationship between specific competitiveness indicators and sustainable development indicators, we first identified the indicators of competitiveness and sustainable development, based on the previous literature review.

When addressing the issue of competitiveness measurement, as shown previously, there are various categories identified.

The most comprehensive study is developed by the World Economic Forum and sustains that the concept of competitiveness involves static and dynamic components: although the productivity of a country clearly determines its ability to sustain a high level of income, it is also one of the central determinants of the returns to investment, which is one of the central factors explaining an economy's growth potential (Sala-I.-Martin et al., 2008). The World Economic Forum uses three indicators to capture all the aspects of competitiveness: growth competitiveness index (McArthur&Sachs, 2001), business competitiveness index (Porter, 1990) and global competitiveness index (Sala – I. – Martin, 2004).

Thus, based on the specific studies, we have decided to use in our study as measures of competitiveness the global competitiveness index, which takes into account both macro- and microeconomic perspectives to analyze national competitiveness (Sala – I. – Martin et. al, 2013). The European Commission proposed the new European Union strategy for smart, sustainable and inclusive growth – “Europe 2020”.

Thus, according to our research's goal, we consider that the following indicators are the most relevant sustainable development indicators, that will be taken into account in our research: socio-economic development; sustainable consumption and production; social inclusion; demographic changes; public health; climate change and energy; sustainable transport; global partnership; good governance.

Based on the specific literature findings, presented above, we have developed the following research hypothesis:

There is a correlation between the competitiveness, calculated as the global index of competitiveness and:

H1: the indicator of socio-economic development; **H2:** the indicator of sustainable consumption and production; **H3:** the indicator of social inclusion; **H4:** the indicator of demographic changes; **H5:** the indicator of public health; **H6:** the indicator of climate change and energy; **H7:** the indicator of sustainable transport; **H8:** the indicator of global partnership; **H9:** the indicator of good governance.

4. METHODOLOGY AND RESULTS

4.1 RESEARCH METHODOLOGY

In order to test and validate the research's hypothesis, we have selected the values for Global Index of Competitiveness and the indicators of sustainable development for Romania. The period of time taken into consideration for the analysis covers 10 years (from 2004 to 2013), thus, the necessary data was extracted for each indicator for the indicated period. The first issue addressed concerned measuring the determined variables, as shown in table 2 below.

Table no. 2. Variables defining

Variable	Coding	Measuring	Source
Global Index of Competitiveness	GCI	$SI_1 + SI_2 + SI_3$	The Global Competitiveness Report
Socio-economic development	SED	Real GDP per capita, growth rate and totals	epp.eurostat.ec.europa.eu
Sustainable consumption and production	SCP	Resource productivity	epp.eurostat.ec.europa.eu
Social inclusion	SI	People at-risk-of-poverty or social exclusion	epp.eurostat.ec.europa.eu
Demographic changes	DC	Employment rate of older workers	epp.eurostat.ec.europa.eu
Public health	PH	Healthy life years and life expectancy at birth, by sex	epp.eurostat.ec.europa.eu
Climate change and energy - Greenhouse gas emissions	CCE-GGE	Greenhouse gas emissions	epp.eurostat.ec.europa.eu
Climate change and energy - Primary energy consumption	CCE-PEC	Primary energy consumption	epp.eurostat.ec.europa.eu
Sustainable transport	ST	Energy consumption of transport relative to GDP	epp.eurostat.ec.europa.eu
Global partnership	GP	Official development assistance as share of gross national income	epp.eurostat.ec.europa.eu
Good governance	GG	Level of citizens' confidence in EU institutions	epp.eurostat.ec.europa.eu

Next, given the nature of our research and of the collected data, we applied an econometric modeling using Microsoft Office Excel 2007.

4.2 DATA ANALYSIS AND INTERPRETATION

Using Microsoft Office Excel 2007, we first realized a descriptive statistic of the eleven variables (GCI, SEC, SCP, SI, DC, PH, CCE-GGE, CCE-PEC, ST, GP, GG), for the 10 years period of time taken under consideration, presented in table 3 below.

Table no.3. Descriptive statistics

Variable	Mean	Std. Dev.	Variance	Skewness	Kurtosis
GCI	3.98	0.14	0.02	-1.29	1.09
SED	5.69	1.44	2.07	-1.05	-0.07
SCP	0.22	0.02	0.4	-0.38	0.24
SI	43.60	2.53	6.39	-0.10	-1.91
DC	40.91	1.77	3.15	-1.30	2.18
PH	60.68	2.72	7.39	-0.43	-2.13
CCE-GGE	52.70	4.95	24.5	-0.007	-2.40
CCE-PEC	35.87	2.00	4.01	0.04	-2.18
ST	97.74	5.12	26.27	-0.32	-0.86
GP	0.07	0.01	0.0007	1.00	-0.65
GG	62.2	6.51	42.4	-0.75	0.95

The Skewness and Kurtosis test values indicate that the analyzed series are not normally distributed and therefore they can be interpreted in our approach.

The estimation strategy carries the running of a separate regression for highlighting the existing connections between each of the indicators. An additional step in the advanced analysis is the development of regressions in order to estimate the intensity of the connections that can be outlined between the various forms of estimation of the dynamic in the outcome competitiveness indicator and the sustainable development indicators (formula 1).

$$y_{it} = \alpha_i + \chi_{it}\beta + \varepsilon_{it} \quad (1)$$

where: y_{it} – the dependant variable, i =entity, t =time; α_i – the unknown intercept for each entity; x_{it} - independent variable; β - the coefficient for the independent variable; ε_{it} – within entity error.

The implementation of the estimation strategy involves:

- ✓ the obtaining of the regression parameters;
- ✓ the estimation of the intensity of the links between endogenous and exogenous variables in terms of Student t-test (an empirical value of this test greater than 2 reflects a significant connection; the higher this value is so can be presumed the fact that the bond strength is more pronounced).

Table no. 4. Analysis results

Variable	Coefficient	Multiple R	R Square	t-stat
SED	0.07	0.71	0.51	2.89
SCP	-3.68	0.52	0.27	-1.75
SI	0.04	0.76	0.58	-3.34
DC	0.02	0.28	0.08	0.84
PH	0.03	0.69	0.48	-2.72
CCE-GGE	0.02	0.81	0.66	-3.95
CCE-PEC	0.05	0.75	0.57	-3.28
ST	- 0.01	0.49	0.24	1.62
GP	6.06	0.35	0.12	1.07
GG	-0.008	0.37	0.14	-1.15
N obs	110			

Based on the results obtained in the regressions we may notice the following issues:

- a 1% increase in the value of SED determines the increase of GCI by 0,07% (as shown in figure 1);
- a 1% increase in the value of SI determines an increase of GDP_c by 0,04% (as shown in figure 2);
- a 1% increase in the value of PH determines an increase of GDP_c by 0,03% (as shown in figure 3);
- a 1% increase in the value of CCE-GGE determines an increase of GDP_c by 0,02% (as shown in figure 4);
- a 1% increase in the value of CCE-PEC determines an increase of GDP_c by 0,05% (as shown in figure 5);
- sustainable consumption and production, demographic changes, sustainable transport, global partnership and good governance (as indicators of sustainable development) do not have a significant statistically impact for the forecast of the Global Competitiveness Index.

Overall, the results of the analysis showed that there is a strong positive correlation between the national competitiveness, measured with GCI and GDP_c and the indicators of sustainable development included in our database. Our observations **validate H1, H3, H5 and H6**.

5. CONCLUSIONS

As stated in the first part of our article, our research has two main approaches: a theoretical one focused on researching the area of competitiveness and sustainable development theory in order to provide the basis of developing new theoretical models and a practical one, namely identifying how firm competitiveness is affected by the sustainability indicators in Romania.

Taking in consideration the theoretical approach, our research underlines the fact that there is no inherent conflict between competitiveness and sustainability, but a need to develop a system of competitiveness which is as beneficial as possible, in terms of economic, social and environmental growth.

First of all, we underlined the necessity for a clear categorization of the theoretical definitions of competitiveness in order to create a fundamental systematic background for the future theory development. As shown in our paper, there are different approaches in defining competitiveness, either from various disciplines' point of view or according to different research areas. When linking competitiveness to sustainable development, we pointed that only two approaches are valid, those of national and international competitiveness, approaches that broaden the concept in considering the dynamic political, economic and social environment. With the growing interest in the problem of sustainability, it shall be expected that in the future the competitiveness' definition will include the sustainability dimension.

We then demonstrated that the relationships between sustainable development and competitiveness are currently acknowledged in the specific research area, emphasizing the shift towards a new concept – sustainable competitiveness.

Moreover, by further analyzing the methodological approaches in assessing both sustainable development and competitiveness, we may conclude that there still is no common ground between researchers as to integrate the two dimensions in a specific

model, with many different interpretations and methods that guarantee reliability and informative value.

As for the practical aspect of our research, our analysis's results demonstrated that indeed national competitiveness in Romania is affected by the sustainable development indicators, however, debates arise when considering the appropriate measurement instruments. In our case, socio-economic development, social inclusion, public health and climate change and energy were shown to be significant, while sustainable consumption and production, demographic changes, sustainable transport, global partnership and good governance had no impact whatsoever.

Countries which are highly ranked regarding competitiveness are even highly ranked regarding living standards (Schuller, Lidbom 2009: 939). Therefore, an environment that supports high levels of wellbeing (socio-economic development, social inclusion, public health) is becoming an important driver of competitiveness as country's endeavors to attract and develop world-class companies and workers.

Of course there are clear limitations of the analysis, namely: the limited number of indicators considered; analyzed data heterogeneous structure; the analyzed time interval (2004 - 2013); possible errors induced by the non-linear interactions between the variables considered.

The main directions of future research would be limited to the integration in the analysis of a wider set of explanatory variables of competitiveness and sustainable development and the extension of the analysis for all of the five levels of competitiveness (firm, sectors, national, regional and international level).

Further, the agreement of the "Europe 2020" strategy for smart, sustainable and inclusive growth creates a need of research leads to develop the concept of competitiveness, with more researches focusing on how competitiveness and sustainable development interact.

Acknowledgment

This work was supported from the European Social Fund through Sectorial Operational Programme Human Resources Development 2007–2013, project number POSDRU/159/1.5/S/134197, project title "Performance and Excellence in Postdoctoral Research in Romanian Economics Science Domain".

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