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ENVIRONMENTALLY SUSTAINABLE ECONOMIC GROWTH

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Abstract
Economic growth and sustainable development are important issues for social prosperity. Sustainable development strives for moderate and responsible use within the economic activity of the limited resources of our planet, whereas economic growth does not limit the resource exploitation and energy, being mainly focused on productivity increase. From this perspective, both conceptual and operational contradictions occur between the two pillars of prosperity. This paper looks to these contradictions and proposes some streams of intervention such as economic growth and environmental sustainability to operate in harmony. A structured framework for innovative problem solving is considered in this respect. Results of this research show that it is possible to induce smart measures in the economic system for directing businesses towards new paradigms where economic growth is possible without negative effects on environmental sustainability.

Keywords: economic competitiveness, economic growth, sustainable development, innovation policy, prosperity.

JEL Classification: O47, Q01

Introduction

Competitiveness is not only about economic performance of a nation, it is also about the environmental and social performance. The synergy between these three dimensions of performance is the path towards sustainable competitiveness (Herciua and Ogreana, 2014). According to the strategic document of the European Commission (EC) called Europe 2020 "A European strategy for smart, sustainable and inclusive growth" (European Commission 2010), European Union (EU) must act to be "smart in innovation, education, training and lifelong learning, as well as digital society; sustainable in competitiveness, combating climate change and using energy more efficiently; inclusive in employment, skills and fighting poverty" (European Commission, 2010, p.3). For achieving these goals EU countries must perform some steps forward (Herciua and Ogreana, 2014).

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Commitment is not enough, because in a highly volatile and competitive market environment, speed of action is also essential (Yang and Meyer, 2015). Nowadays, in the capitalist economic model, economic growth is considered as a basis for welfare of societies. Using the concept of gross domestic product, economic growth is currently treated as an aggregated growth of production of goods and services in various sectors of the economy. For example, the main source of economic growth in agriculture is efficiency improvement (Bezat-Jarzębowska and Rembisz, 2013).

However, new definitions and new approaches to assess competitiveness of the EU countries have been recently discussed in the economic literature. The traditional approach of counties' competitiveness evaluation oriented on cost-based measures such as unit labor costs, real effective exchange rate (REER) or unit labor productivity is not sufficient. Today's Europe seeks for sustainable, smart, inclusive and environmentally friendly economic growth. From this perspective, the traditional cost-based approach of productivity assessment provides a limited perspective. For instance, potentiality of knowledge-based economy and firm-level perspective are not captured by the traditional approach (Rozmahela et al., 2014). Regardless of whether cognitive competence causes national wealth or whether there is a reciprocal relationship, aid directed at improving the cognitive competence of a population should have an economic payoff (Hunt and Wittmann, 2008).

Following the same stream, it makes sense to highlight that, from the perspective of sustainable development, it is a strong correlation between reduction of corruption, economic prosperity and reduction of environmental degradation. While corruption will not be recognized as a global problem for the conservation of biodiversity, effective actions will not happen. Emerging studies have found that the level of corruption in a country is positively associated with environmental degradation (Krishnan et al., 2014).

It is also important to notice that social conflict and slow growth are specific characteristics of many developing economies. For these economies, the importance of deeprooted institutions of property rights and conflict management that provide a foundation for individuals in the enforcement of their property claims is increasingly recognized. In this context, some researchers have found that maximization of economic efficiency may call for a reduction in growth in order to mitigate the problem of diversion, even though the economy's growth is inefficiently slow in the absence of taxation (Gonzalez and Neary, 2008).

The development of an increasingly globalized economy adds new urgency to humanity's efforts in order to anticipate the challenges ahead and the opportunities for further prosperity. Calamities that once were regional in nature, such as endemic diseases, economic boom and bust cycles, or local social and political conflicts, now can rapidly spread to unravel the fabric of previously far-flung places. However, globalization can also help mobilizing distant resources to address local challenges. The uncertainty about possible outcomes of ever larger numbers of interactions among ever larger numbers of people, businesses and institutions, keeps increasing, and the prospects for true surprises keep rising (Ruth et al., 2011).

Recent contributions to ecological economics and related social sciences indicate that issues such as climate change, resource depletion and environmental degradation cannot be effectively addressed under conditions of continued economic growth. Indeed, in the absence of evidence for absolute decoupling of gross domestic product (GDP) growth,

material resource use and carbon emissions, it is remarkable that most policy approaches do not question the priority placed on GDP growth (Fritz and Koch, 2014).

Since economic growth is intrinsically linked with an increased production of goods and services, and on its turn this is linked with resource depletion and environmental impacts such as global warming, the assumption of continued economic expansion in rich countries challenges the possibility to achieve prosperity without growth (Jackson, 2009). As example, for developing sustainable products, design engineers need to foresee diverse interrelations between a product's characteristics and it's economic, social and environmental impacts (Buchert et al., 2015).

In this context, the present paper treats the complicated aspect of balancing two contradictory dimensions related to prosperity of civilization: economic growth and sustainable development. In this respect, the paper includes a background section where the meaning of economic competitiveness is analyzed in relation with prosperity from a niche angle. It is shown that economic growth does not necessarily lead to social prosperity in any conditions. Further, in the next two sections of the paper the perverse effect of economic growth in relation to social prosperity is analyzed. Major conflicts are identified, too. They are afterwards tackled from an innovative problem solving perspective, revealing several lines of action towards ensuring economic growth with lower or low impact on sustainable development. Examples of public policies in relation to this issue are also highlighted. Paper ends with conclusions and insights on future researches.

1. Basics on economic competitiveness

Economic competitiveness is a major indicator for nations, regions and companies in terms of capability to operate in the global market with success. There is no unanimous definition of economic competitiveness (Huggins, 2003). For example, the Irish National Council of Competitiveness considers economic competitiveness as the ability of a nation to be successful on the international markets in order to improve the quality of life of the whole nation (National Competitiveness Council, 2014). The World Economic Forum sees economic competitiveness as the ability of a nation to get high and sustained rates of the GDP/capita (World Economic Forum, 2014). At Harvard Business School, the recent definition of economic competitiveness considers social aspects incorporated. Thus, a nation or a region is competitive in the limit in which companies that operate within that space are capable to compete with success in the regional and global economy improving in the same time wages and living standards of the ordinary people (Harvard Business School, 2013). There are several other similar definitions of economic competitiveness, but they are not mentioned here because frankly speaking do not bring new perspectives on this concept.

An important issue that is not captured by any definition of economic competitiveness is the ethics of governments and multinational corporations (MNCs) in the international politics. This aspect is graphically captured in Figure no. 1. According to this, several aspects generate barriers for economic development of a nation. They include protectionism of national markets, health of national economic environment, national and international legislation, commercial wars, as well as the ethics of strong governments and MNCs on the international politics. These barriers require extra-innovations to be considered by the

smaller firms operating in a given economic environment in order to ensure and maintain attractive levels of productivity and wages for workers.

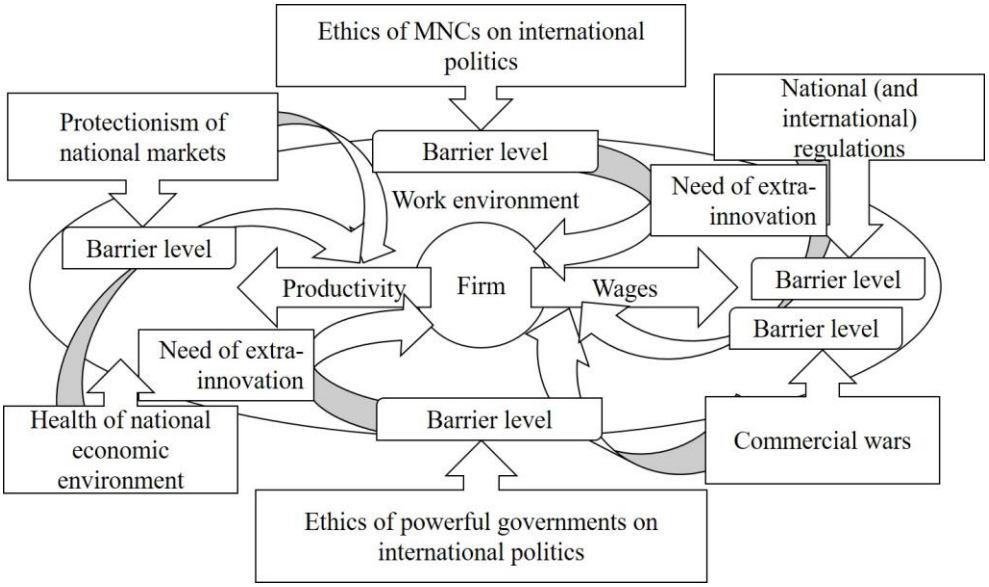

Figure no. 1. Barriers in the equation of economic competitiveness

Having ethics in mind, this paper proposes a more nuanced definition of economic competitiveness. It defines economic competitiveness of a nation as a measure of happiness, welfare, health, morality, ethics and social statute of the ordinary people and the capacity of preservation, renewal, diversification and sustainable development of human, natural, financial and technological resources of that nation through the prism of social entrepreneurship initiatives and medium and long term commercial viability of autochthon companies in the national and international competition constrained and distorted by "zero sum result" egoistic interests, corruption, imperialism, economic stability treaties and political manipulation.

This perspective on economic competitiveness highlights the fact that a high growing GDP/capita does not necessarily mean an automatic increase of the population welfare. A durable economic growth, which allows high rates of workforce productivity and employment, requires capabilities from the public and private socio-economic entities to produce and/or sell products and services with high value added, as well as to attract sufficient external resources (human, financial, etc.) to sustain development.

Is thus possible to define a framework in the global competition such as all countries to win? In theory, this requires smart ways to increase GDP/capita, considering both moral, social and ecological perspectives, as well as optimal approaches from economic point of view (i.e. to maximize effects in the given constrain space of action). Thus, to ensure social prosperity, extra-innovations are necessary in the equation of economic competitiveness.

Association of economic growth with economic competitiveness has a dark side. There is a perverse effect of economic growth in relation with social prosperity; that is, economic growth strictly seen from the restrictive view of GDP/capita might neglect – and facts shows that it actually neglects – sustainability both from social, ecological and economical perspectives. This is mainly because, the conventional models of economic growth mostly operate with traditional resources that are energy intensive and quantitatively limited.

2. A brief literature review on sustainable economic growth

Analysis of economic growth from the perspective of its implications to environmental degradation is in the attention of researchers from more than two decades. There are research works whose theory is that the environmental limited endowments do not constitute a concern for economic expansion (Radetzki, 1992). Radetzki bases his theory on human behavior in response to tendencies towards environmental degradation, claiming that people will adapt and "will assure the compatibility of continued economic growth with the maintenance of satisfactory environmental standards". Beckerman is another researcher that considers environmental resource constraints do not represent a limitation for economic growth (Beckerman, 1992). He also claims that sustainable growth is a concept that is morally vulnerable or nonoperational. Other early work on this topic says no evidence was found that environmental quality deteriorates continuously with economic growth (Grossman and Krueger, 1994). Their researches concluded that economic growth comes up with an initial degradation of environment, but there is a turning point (around the income of 8000$ per capita) where economic growth brings improvement in the quality of environment. To a similar conclusion comes up another work (Panayotou, 2000), which introduces the concept of inverted-U relationship between environmental degradation and economic growth, also known as the "Environmental Kuznets Curve".

Despite the above mentioned conclusions, if no coordination exists between industrial growth, environment and resource, high unbalances occur (Zhengge, 2008). This statement is the result of researches done in five regions of China. It brings a major message; that is, economic growth should be seriously balanced with an adequate structure and technological progress of the industrial sectors in an ecosystem such as to lower the environmental footprint. A valuable documentation resource is the work of Brock and Taylor, which reviews various theories and empirics related to the binome "economic growth-environment sustainability" (Brock and Taylor, 2005). They conclude that still several theoretical questions exist, especially in relation with the limit of growth such as to avoid the "tipping point" from where the environment cannot compensate consumption of raw resources. Another advocate for a well-controlled economic growth to limit environmental pollution stands in the work done by Anastasios Xepapadeas. He highlights significant deviations between market outputs and social optimum, as well as between environmental quality and economic development in non-controlled socio-economic ecosystems (Xepapadeas, 2005). He considers crucial to find ways of decomposing total factor productivity into its sources and controlling economic growth from an environmental perspective, as long as evidences clearly show an economy produces not only the desired output, but also undesirable environmental pollution.

An important consideration on economic growth is about its moral consequence in society. Seeing economic growth in direct relation with the living standards of citizens, empirical studies observed that people move towards democratization, tolerance, diversity and

mobility in growing economies, whereas stagnation of economy works against these values (Friedman, 2005). Thus, the challenge is not about building prosperity without economic growth, but about finding solutions to grow without affecting sustainable development. The key issue stands in the direct correlation between economic growth and energy needs for mobility, production, living, education, etc. With conventional energy sources, dataset show environment is degrading and CO_2 are increasing (Rania and Chaker, 2015; Xiong et al., 2015). Therefore, most scientific papers that treat the conflict between economic growth and environmental degradation are focused on technological issues (e.g. new energy sources, inclusive development, waste management through technology, etc.), area planning and fight against the corruption reflected in savage exploitation of raw materials.

3. Research methodology

In this research, the methodology to approach the conflict between economic growth and sustainable development is formulated around the scheme from Figure no. 2. On one side, classical paths for economic growth generate more complications in society, including negative effects on sustainable development. On the other side, the issue is about the possibility to ensure social prosperity without economic growth.

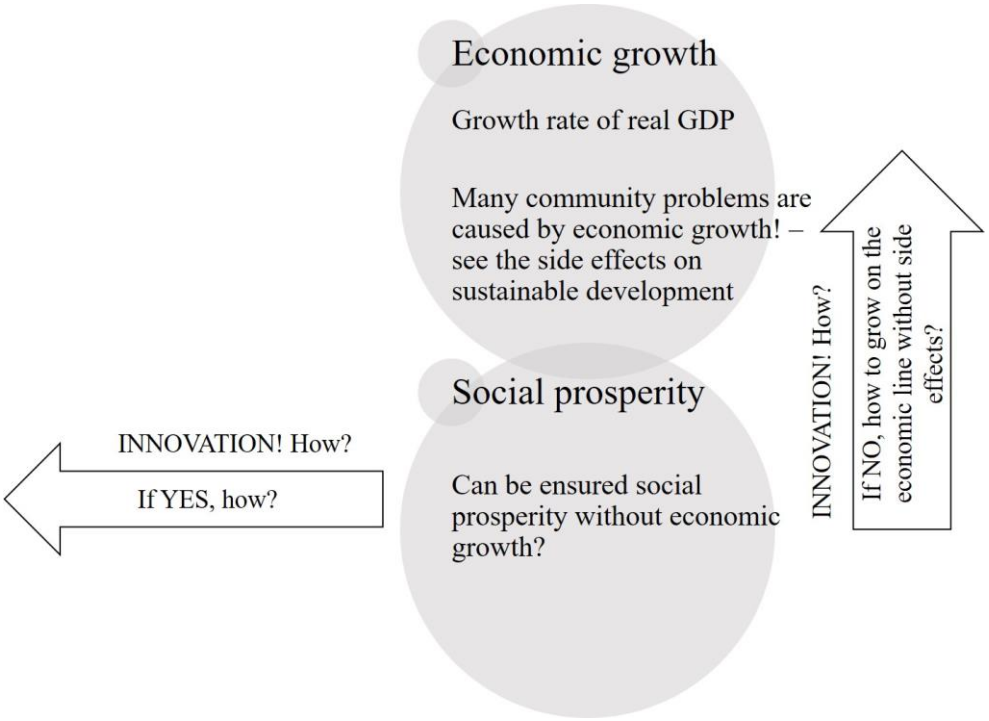

Figure no. 2. Dilemma between ecologically sustainable economic growth and social prosperity

In this context, this paper considers a method for innovative problem solving in management called TRIZ-M (Brad and Brad, 2013), which is actually the adaptation to managerial issues of a well-known method called TRIZ (theory of inventive problem solving) (Altshuller, 2004). The TRIZ-M method works like this: (1) identifies a conflict between two parameters (e.g. more energy supply needed is in conflict with lower raw minerals consumption); (2) associates to each particular parameter a generic one from a limited list of 39 generic parameters (e.g. energy consumption is associated with parameter "quantity of substance" and raw material consumption is associated with "waste of material" or/and "secondary harmful factors acting on the system"); (3) uses a so-called TRIZ-M matrix of contradictions to identify generic directions of intervention (also called vectors of innovation); (4) ideates around the generic directions of intervention to formulate innovative solutions to the particular problem.

In order to find out more about the TRIZ-M method please consult the web link: http://193.226.17.76:8080/sts291-mvc/tool_cmx.do?aProject=1&aSet=1&aAct=1&aTarget=1&aActivityName=1 that introduces a software tool developed by the authors for easy application of TRIZ-M. In the framework of TRIZ-M, economic growth is associated with the parameter "amount of substance (e.g. money, know-how, output, etc.)", and sustainable development is associated with the parameter "secondary (side) harmful effects on the system".

The following generic vectors of innovation are proposed by TRIZ-M in the case of conflict "economic growth-environmental sustainability": (a) Vector 1: actions to increase local quality; (b) Vector 2: actions to transform system properties; (c) Vector 3: actions to create composite structures; (d) Vector 4: actions to introduce inert environment. This is suggestively illustrated in Figure no. 3.

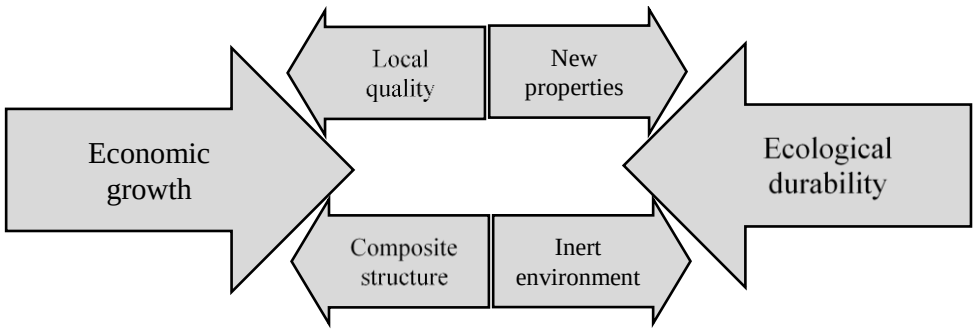

Figure no. 3. Vectors of innovation towards environmental sustainable economic growth

Each generic vector of innovation has several guidelines. Vector 1 (actions to increase local quality) is detailed into the following patterns:

- Actions to transform a homogeneous structure into a heterogeneous structure or vice versa;
- Actions to ensure that different parts of the system will perform different functions;

- Actions to ensure that each part of the system will be placed in the most favourable position for its operation.

Vector 2 (actions to transform system properties) consists of the following directions of investigation:

- Actions to change the state of the system;
- Actions to change the concentration of the state;
- Actions to change the conditions;
- Actions to change the degree of flexibility;
- Actions to change the volume.

Vector 3 (composite structures) means to replace a homogeneous system with a composite one. Vector 4 (inert environment) is about replacing the normal environment with an inert one or about introducing a neutral element in the system. The vectors of innovation and their guidelines are sources of inspiration for the policy makers to formulate solutions to the problem under consideration. This issue is treated in the next section of the paper.

4. Results and discussions

The guidelines revealed in the previous section are important pillars towards formulating innovative solutions to balance economic growth with environmental sustainability. The four vectors and their related directions of intervention actually show to what constrains should be subjected economic activities in a given regional/national ecosystem such as environmental-friendly innovations to be promoted for growth and social prosperity. Thus, instead of trial-and-error approaches to discover the proper patterns of evolution for the complex ecosystem, policy makers would know in advance where to direct their efforts.

Beyond this, having known the set of directions of intervention, it is possible to determine the motricity and dependency of each direction, as well as the correlations between these areas of manifestation. With such information, policy makers can define priorities of their policies.

The third important aspect is the balancing mechanism between the economic growth and environmental sustainability. Researches presented in the introductory sections of this paper highlight that environmental degradation can be avoided in the equation of economic growth if a clear control acts on the industry structure and proportion, as well as on the technology used. These researches reveal that at a certain level of economic prosperity industry structure and economic activities are such as they support environmental protection (please revisit the Environmental Kuznets Curve); the challenge is in the developing and emerging economies, with low productivity rates and economic activities that stands on basic factors (natural resources, human resources for physical work). The smart use of the vectors of innovation proposed in the "Research methodology" section can bring valuable ideas for adequate policy design in order to balance the evolution of economy in good harmony with environmental preservation, too.

Figure no. 4 illustrates the matrix for determining the motricity and dependency of the 11 generic directions of intervention. In Figure no. 4, motricity decreases from 1 to 7, and dependency also decreases from 1 to 7. The best areas of intervention are those with high motricity and low dependency (the best case is motricity 1 and dependency 7).

The challenging areas of intervention are those with low motricity and high dependency (the worst case is motricity 7 and dependency 1).

	1 = high motricity … 7 = low motricity; 1=high dependency … 7=low dependency; A=weak influence=1; B=medium influence=3; C=strong influence=9; D=very strong/critical influence=27	V1.1	V1.2	V1.3	V2.1	V2.2	V2.3	V2.4	V2.5	V3.1	V4.1	V4.2	SUM	DEPENDENCY
V1.1	Transform a homogeneous structure into a heterogeneous structure or vice versa		C		B	C	C	C		C		A	49	**4**
V1.2	Make such as different parts of the system to perform different functions	D		B			D	C		A			67	**5**
V1.3	Each part of the system to be placed in the most favourable position for its operation	D	B				D	D					84	**1**
V2.1	Change the state of the system	C		B			B	B	A	C	B	B	34	**6**
V2.2	Change the concentration of the state	C	A	B			C		B	C	B		37	**6**
V2.3	Change the conditions	C	B	C	B			C	B	C	C	C	63	**3**
V2.4	Change the degree of flexibility	D	B	C		A	C			B			52	**4**
V2.5	Change the volume	C		B		B	C			C	A		34	**6**
V3.1	Replace a homogeneous system with a composite one	D	C	D	B	C	C	A	A		A		87	**1**
V4.1	Replace the normal environment with an inert one	B					C		B				15	**7**
V4.2	Introduce a neutral element in the system	D	B	C	B		C	C	A	C			70	**2**
	SUM	174	31	66	12	22	120	67	12	58	17	13		
	MOTRICITY	**1**	**5**	**3**	**7**	**6**	**2**	**3**	**7**	**4**	**7**	**7**		

Figure no. 4. Motricity, dependency and correlations between innovative generic directions of intervention

Figure no. 5 shows in a suggestive way the relevance of the innovative generic areas of intervention. In order to organize them in a decreasing order, a simple rule is to calculate the square root of the sum of quadrates of motricity and dependency for each area of intervention. For example, V1.3 has the index $(1^2 + 3^2)^{1/2} = 3.16$. Thus, the resulted order of priority is: V1.3; V2.3; V1.1; V3.1; V2.4; V1.2; V4.2; V2.2; V2.1; V2.5; V4.1.

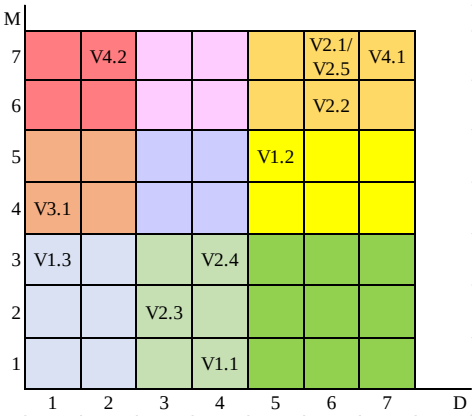

Figure no. 5. Positioning the generic areas of intervention by motricity and dependency

Using the generic directions of intervention in their decreasing order, several innovation policies are further proposed in this paper to reduce the contradictions between economic growth and sustainable development. The first group of policies is referring to V1.3: "actions to make each part of the system to work in the most favourable conditions". The public policies inspired from vector V1.3 are presented in the followings.

Public policy 1: *Optimized budget allocation and distribution based on criteria referring to prosperity and sustainability*. "Allocation" is about slicing the budget in optimal proportions to various areas of interest such as to maximize prosperity and minimize environmental impact. "Distribution" is about individualized giving of the limited slice of budget based on effectiveness and efficiency criteria. There are different indexes used to measure social prosperity. This paper encourages the following prosperity metrics: familial bonds; charity intent; trust between people; personal freedom; personal safety; personal security; women rights; health care quality; quality of education; equality of education; entrepreneurship support; democracy level; corruption level. For sustainability, the following metrics are considered: air quality; river and lake water quality; emissions per capita; emissions per energy generated; industrial carbon intensity; growing stock of forest; irrigation stress; agriculture subsidies; burnt land area; river and lake trophic level; pesticide level; sulphur dioxide emissions; regional ozone; area of protected land. Prosperity metrics can be ranked by means of extensive sociological surveys. Sustainability metrics can be ranked by experts. Considering various planning tools like relationship matrices, various sectors and sub-sectors can be very elegant weighted for budget allocation (e.g. education, health, defence, culture, administration, environment, etc.). For distribution, performance targets are allocated to each budgeted sector. A project initiative to a certain sector means allocation of an amount of money for some activities in order to cover a percentage of the targets. Distribution is actually done with priority to those project initiatives that demonstrate capability to cover a higher set of metrics and levels of their targets at lower costs. It is encouraged to apply this policy both at central, regional and local levels.

Public policy 2: *Support smart specialization (RDI, incentives, guaranties, education, entrepreneurship, etc.) in areas of economy that best support prosperity and sustainability*. The process is very similar with the one described at policy 1, but in this case criteria of prosperity and sustainability are deployed against economic sectors and education fields of specialization. Even lagging countries and regions can apply this policy, using moderate quantities of basic factors to generate high value added outputs and supporting connectivity with leading countries for business model development. For example, instead of cutting down large areas of forest and sell wood logs, the policy enforces to limit deforestation and to use the cut wood in local factories to manufacture luxury furniture, by investing in training rural communities in luxury woodwork and partnership development with design studios (autochthon or international), as well as with global networks for distribution and sale. There are already examples of smart businesses and economic activities that started from basic factors and endowments and then were capable to generate high value added and lower environmental degradation.

Vector V2.3 is the second source of inspiration for sustainable growth public policies. It refers to "actions for changing conditions". This line is interpreted in this paper by the following innovation policies.

Public policy 3: *Over-taxation of energy for industrial use in polluting sectors, over-taxation of natural raw materials and transportation of low value-added goods and raw materials*. This policy will encourage circular economy, social economy, and investments in education of local communities and in higher value added businesses.

Public policy 4: *Commitment to effectively fight against corruption*. Fight against corruption is a political will. "Change of conditions" in this case is also applied to the way of approaching the policy. Top-down approaches were already proven to be less effective.

Therefore, the chance to implement such policy is by following a bottom-up approach. As many interesting things have happened in the recent years by persistent actions of non-governmental organizations (NGOs), functional economic cluster initiatives, interest groups linked by means of social platforms (Facebook, LinkedIn, etc.), media, etc., powerful initiatives and constant pressure on politicians can be executed to change legislation and to act with more conviction against corruption. In fact, the democratic process of elections can be radically changed by elites and public influencers using social networks, too. Legislative initiatives must come from communities, while politicians must be analyzed by means of their effectiveness in supporting these initiatives. In principle, effective measures are those that penalize infringements in a way that the associated risk is above the level of psychological acceptance.

Public policy 5: *Link investment to its lifecycle and to risk reduction*. Change the rules in public and private investments such as other indicators than price to become factors of decision. For example, instead of price, financial net present value (FNPV), internal rate on return (IRR), return on investment (ROI), and economic net present value (ENPV) should become relevant decision means. Also, instead of considering products, large investments should consider product-service systems. A very good model in this respect is that already applied in the defense sector, as well as the model of total cost of ownership (TCO).

The next vector in the list of priorities is V1.1: "actions to change the system from uniform to non-uniform", with respect to which the following innovation policies are encouraged in this paper.

Public policy 6: *Put more accent on projects that promote moral evolution*. Good examples in this respect are the open-source projects in information and communication technologies (ICT), especially for the public sector, but also the support of open-technology projects in other economic areas. Beyond this, cultural evolution of people is essential to promote morality and cardinal virtues. In this respect, public and private projects that promote exemplary models and personalities, success stories in various fields, social values, and high-class cultural events must be fully financed or co-financed from public funds. Crowdfunding and crowdsourcing initiatives promoted by public authorities and media are also excellent innovations in this direction. Investment in education, not only in instruction is a key issue in this direction, too. For example, entrepreneurial attitude and qualities cannot be learned in a traditional course. This requires years of non-conventional training of critical mass of people from each generation. It is like the evolution of a person that practices martial arts along many years, which fights against his/her limitations and progresses by getting out continuously of the own comfort.

Public policy 7: *Encourage reverse and inclusive technological innovation*. Affordable technologies for low-end consumers and disadvantaged communities are very good examples of sustainable economic growth. Over 85% of the global market is referring to these categories of consumers. There are already plenty of successful projects in construction that show it is possible to build relative comfortable houses with budgets varying from 1000$ to 5000$ or 10000$. Only directed distortions in the market make that many people to have no house or to work the whole life to payback the bank loan for a house. Like food and clothes, a decent house must be a basic good for every individual. Many technological innovations consume too much resources and in reality very few people are capable to really exploit the complete potential of these innovations. There are many examples of technologies in health care that cost 3000$ and make the same things like others of 100000$. It is only the greed of capitalists to

maintain a certain state of the market for huge profits. But these market rules are hopefully going to be changed in the future.

Public policy 8: *Lead moderate consumption by higher taxation*. Countries like Sweden, Finland and Norway are good role models for sustainable economic growth with respect to this public policy.

Public policy 9: *Direct personal and corporate consumption towards sustainable growth*. Introduce extra-taxation to all goods and services that affect environment during operation or due to the technologies used to manufacture them. An energetic index and an environmental index must be designed and applied in this respect. Introduce extra-taxation to all personal earnings that exceed a certain reasonable limit and direct these taxes to social, cultural, educational, health, research and environmental projects according to the will of the charged person. Limits should differ from country-to-country (e.g. a limit for USA in 2015 would be 100000$ net/year/person or 400000$ net/year/4-person family; a limit for Romania in 2015 would be 24000€ net/year/person or 96000€ net/year/4-person family).

Public policy 10: *Support economic initiatives that promote "common shared value"* (CSV). Shared value is a business practice that enhances the competitiveness of a company while simultaneously advancing the economic and social conditions in the communities in which the company operates. The concept is attributed to M.E. Porter and M.R. Kramer (Porter and Kramer, 2011). Shared value is not corporate social responsibility and is not philanthropy. It is a novel way to achieve economic success by recognizing that markets are defined by both economic and societal needs; or, in very simple words, to create value for all stakeholders not only for shareholders. Bio-food production is a shared value economic activity. Mobile apps for smart parking in crowded urban areas is a shared value business. Supporting farmers to develop permaculture and to buy from them the agro-products at decent prices is shared value; and examples can continue. Incentives given by government through various grants for such businesses would be beneficial for sustainable economic growth. An interesting source of documentation is the portal sharedvalue.org.

It is not the purpose of this paper to introduce the comprehensive set of public policies that might emerge from the vectors of innovation revealed in the previous section of the paper. The paper mainly highlights the fact that it is possible to approach the policy making process for economic growth in a smart, structured and systematic way with respect to some constrains, such as the environmental issues in this particular case. However, brief exemplifications of other policies are introduced in the next paragraphs.

In relation with the group "parameter change", the following innovation policies could be considered: more focus on knowledge-based economy, more accent on intangible assets, incentives for resilient factories, development of circular economy, more focus on e-economy, on "green economy" and mostly on "blue economy".

The group referring to "preliminary actions" leads to possible innovation policies like: impose investment models based on life-cycle costs, increase connectivity in communication and know-how through open innovation practices, regional economic autonomy.

The group "composite structures" leads to the following possible innovation policies: incentives for business models based on polycentric innovation, support for strategic aligned cluster initiatives, co-opetition models and collaborative consumption of expensive

infrastructure investments. Several others innovation policies can be formulated in the spirit of the innovation vectors introduced by this paper.

One could deduce from the examples of public policies highlighted in this paper that ecologically sustainable economic growth involves orientation of economic models towards their life-cycle, bottom-up approaches, colaborative consumption, polycentric innovations, more orientation on social dimension, etc.

Conclusions

In the context of exponential growing of the population in some regions of the globe, of visible climate change and saturation of many traditional markets, to which it can be added the brutal and immoral exploitation of natural resources, exponential increase of energy needs in a few concentrated parts of the world, globalization of the financial capital and businesses, increased discrepancies between poor and reach people, the call for rapid measures towards sustainable development is fully justified. However, the fear for a painful transition that could lead not only to economic problems but mainly to social problems, determines policy makers to approach sustainability in a very timorous way.

This paper shows that this dilemma can be tackled in a creative way with reasonable positive results. Using a method for innovative conflict solving, this paper identifies effective directions of intervention. The novelty of the approach consists in the fact that the analysis of the conflict between resource conservation and the growing need of consuming them is done with respect to the principle of ideal result (consumption in the limits of capacity and regeneration cycle of resources) and proposes the search of solutions within zones that are proper identified from the very beginning.

In order to overpass the contradiction between economic growth and sustainable development, some nonconventional public policies are proposed. Because the set of public policies emerge from a structured approach of the problem using the scientific foundation behind the TRIZ-M method, it can be concluded that they might have a supplementary degree of argumentation with respect to proposals that would emerge only on an empirical basis. It is important to highlight the fact that, a series of themes already promoted in the public space, as circular economy, colaborative consumption and co-opetition, investment models based on life cycle thinking, smart specialization, etc. are also validated by a structured analysis of the problem. In addition, this research brings to surface themes that are not yet taken into account very seriously, as resilient production, polycentric innovation, blue economy, shared value, optimal allocation and distribution, reverse technological innovations, etc.

Results of this research show that prosperity can be achieved by implementing new policies that are aligned with sustainability in its large sense (economic, social, and ecological). Researches can be extended on identifying other conflicting areas in the equation of economic growth and approaching them from an inventive perspective. Policies for balancing sustainable development with economic growth can be further refined to the level of actions and projects, both by means of public and private initiatives.

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