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THE MACROECONOMIC FRAMEWORK OF SUPPORT ANALYSIS FOR SUSTAINABLE BUSINESSES DEVELOPMENT

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Abstract

The state of satisfaction of an economy results from the quality of the economic products it produces and consumes, in agreement with assuring environment protection, as a source of producing present and future economic goods, and with intensive utilising of human capital, as a source of innovation growth. Knowledge transfer happens in a sustainable economy, whose principles are rational use of resources, limiting of waste, protection, for enabling future generations to have also access to resources.

The present research is based on a multifactorial liniar regression model which outlines the direct correlation between the dependent variable *welfare* and the independent variable of concentration measured by the Gini coefficient of wealth concentration, on the one hand, and by the GDP level, on the other hand, at the level of year 2012. The aim of this research is to identify the correlation between the indicator of quality of life satisfaction or of the welfare function at the level of EU 2012, and the assurance of a macroeconomic framework for sustainable business development.

Keywords: qualitative and quantitative growth, weak/ strong sustainability, social objectives, ecological objectives, unity, sustainable businesses.

JEL Classification: O15, O44, O47

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Introduction

Most of the studies in the sustainability area indicate that the tools for analyzing this domain were conceived somewhat in isolation from the signals of eco-natural limits (which are very old, like in the classical examples offered Malthus, Jevons, Mill) and from the possibility of the environment to cope with the effects of soil exhaustion, of consumption, of radiations, etc. The main concern of our days is, thus, the one of reintegrating the economy and/or society within the natural sustainability limits (Commoner, 1980; Holling, 1996; Gowdy, 2012). What stands out clearly from latest years research is that an economy based on price dynamics, opportunity cost, Pareto equilibrium, accumulation, maximization of utility or profits, and comparative advantages that use the increase of GDP per capita as welfare indicator is unsustainable and problematic.

An alternative to the traditional growth model seems to be a paradigm focused on social and ecological objectives, not on maximizing utility (strong sustainability/quality growth).

This paper attempts to identify a wellbeing function determined by the relationship between the economic growth (GDP per capita) and the distribution of wealth in society, measured by the GINI coefficient. Also, it was aimed to identify several correlations between the wellbeing function and the creation of the premises for economic sustainability, by strengthening the qualitative side of the economic development.

The first part of the paper presents the values of the indicators of life quality satisfaction, of GDP rate, as well as of the distribution of wealth, measured by the GINI coefficient, as a factual basis for building a multiple econometric models which captures the nature of the influences among the selected indicators.

The second part is a plea for sustainable development in connection with the rational use of resources, showing the advantages of a growth based on ecological and anti-consumption economy (economic de-growth), with positive effects on sustainable business development. Also, as far as resource allocation is concerned, the authors focus on the eco-efficiency of the allocation process, altogether with assuring the economic justice and finding the weak points of releasing high technologies in the environment. Relying on an exaggerate optimism, given the fact that economic progress tends to produce rebound effects, and the market to internalize the benefits and to socialize costs, the wellbeing function becomes complementary to adjusting by the GDP level.

1. Literature review

The traditional model based on the identification of intensive and extensive factors which sustain GDP growth, and economic growth, respectively, is gradually replaced by a model based on the GDP capacity to generate social wellbeing, in terms of social justice, income (economic justice), and environment (sustainability).

Sustainable development refers to the process through which a society preserves its resource potential, giving equal development opportunities to future generations, and also assuring the premises of an increase in welfare for the present generations, by setting a strategy of economic policy which targets rational use of resources. The definition of sustainability resides in identifying the classes of capital which give utility to the individual, by satisfying its present and future needs, in the sense in which the future generations benefit at least in the same amount as present generations of a certain level of utility of capital. Thus, the classes of capital are: natural capital, manufacturing capital (machines, technology, production

infrastructure), human capital (knowledge, capabilities and aptitudes of the individual), and social capital (governance system, institutions). The preservation of capital, in its whole, means to identify a set of values and instruments through which natural capital can offer to future generations economic goods that will assure at least the same level of utility as know. This can be accomplished by developing the human capital as a basis for increasing the stocks of manufacturing capital, for protecting and preserving the natural capital and for increasing the efficiency of social capital. Using this classification of the capital, Eric Neumayer defined two classes of sustainability:

i) *weak sustainability*, where the classes of capital are substitutable (see also Gutes, 1996), in order to maintain or to increase the total stock of capital transmitted to further generations, generally by saving (investing);

ii) *strong sustainability*, which rejects the idea of substitutability of capital forms, of the role of the investing process in preserving the capital stock, especially of natural capital, left to future generations, at least in terms of maintaining the same utility level (Neumayer, 2004; 2010).

By extending the model of capital classes against the sustainability concept, three dimensions of sustainability were identified: the social, economic and natural, or environmental dimension. Thus, sustainable development refers to the social and economic development process, while taking into consideration the limits of the natural dimension of sustainability, respectively of the ecologic sustainability. According to Martin Powell and Philip Sutton, ecologic sustainability refers to the capacity of ecosystems to maintain their essential, latent functions and processes, to preserve biodiversity on a long term, without the harmful human intervention for modifying their structure, form or spatial dimension. Within the economic sustainability process, one should maintain the diversity of life, expressed through the natural capital and the productive capacity of this capital, to ensure at least the same living conditions to future generations.

As far as growth is concerned, the concept of strong sustainability is mostly focused on aspects related to the development and the life quality and less, on aspects of accumulation, increase in consumption and GDP growth (Ayres, van den Bergh and Gowdy, 2000). The difficulties, advantages and applications that arise from the weak and strong sustainability concepts are thoroughly discussed by Goodland (1995) and Dietz and Neumayer (2006). The old process of efficient allocation is in a continuous fight with the new phenomenon of sustainable de-growth, corresponding to the new political, economic and social movement based on ecologic and anti- consumption economics.

The concept of strong sustainability rejects the optimism based on continuous growth, market price dynamics (as the only instrument of efficient allocation and distribution) and environmental substitution, insisting on the idea that sustainability is mostly about making available to future generations the same level of non-renewable resources and environment quality. In its turn, the substitution of non-renewable natural capital with capital resulted from production is problematic, because it is limited, and moreover because the production of capital implies consumption of materials and energy which cannot be substituted (Daly 1997).

Relative to discussing the allocation, in order to comprehensively approach the concept of economic justice, Chichilnisky (2001) coins the concept of *tragedy of commons*. Resource allocation becomes a matter of survival, for present, as well as for future generations, in terms of access to the environment and to its benefits, and it may be approached, with major advantages, through knowledge. The more eco-efficient the allocation process becomes, the more the distribution of wealth in terms of economic justice will generate

growth. What brings economics and ecology on contrasting positions is probably the model in which the market functions based on the negative externalities that it produces.

2. An European experimental investigation with a macroeconomic modelling descriptive and sustainable anticipative role

The paper suggests an econometrical multiple regression model in order to stress the relationship between a dependent variable, which is the level of wellbeing and two independent variables as regressors, the level of GDP rate (Gross Domestic Product) and the coefficient Gini of concentration of wealth.

Using the multiple regression model the correlation between wellbeing, the rate of economic growth and Gini coefficient is tested, as a premise for drawing conclusions on the nature of the economic growth. Also, it was taken into account the identification of strong sustainability characteristics of the economic action, favourable for the development of sustainable businesses.

The research, completed in 2012 at the European Union level, called *European Quality of Life Survey 2012, How satisfied are you with your life these days?* Showed that the countries with the highest score in terms of satisfaction concerning the ensuring of quality of life criteria are Denmark, Iceland, Finland and lowest scoring countries are Bulgaria and Hungary. Romania is situated at the bottom of the ranking (number 21 of 28, with a score of 6.7).

Choosing these data for the research took into account the validity of the rebound effect, meaning that the economic growth measure with GDP rate is a prerequisite for ensuring economic welfare function, the relationship between the economic growth and welfare being a continuous and positive direct relationship.

So, the countries with high values of the life quality satisfaction measure (over the level of the Median value for this indicator, which is 7,2) are characterised by GDP levels over the mean of 103,125, and the values of the Gini coefficient reflects the inequality level lower, as regards with the countries with a satisfaction level below the Median value.

Based on statistical data on GDP and of Gini coefficient from 2012, computed for the European Union countries (Table 1), the existence and validity of a relationship between the wellbeing state and the economic growth, on one side, and between the state of wellbeing and the inequality of revenues distribution, measured by Gini coefficient, on the other side, through the development of two simple regression models.

Table no. 1: Quality of Life Indicators, EU, 2012

Rank (PIB)	Country	[1]GINI Coefficient	[2]GDP (EU mean = 100)	[3]Measure of the satisfaction for the quality of life (Wellbeing)
1	Denmark	28.1	126	8.4
2	Island	24.0	115	8.3
3	Finland	25.9	115	8.1
4	Sweden	24.8	126	8.0
5	Luxemburg	28.0	263	7.8
6	Austria	27.6	130	7.7
7	Holland	25.4	128	7.7
8	Spain	35.0	96	7.5

Rank (PIB)	Country	[1]GINI Coefficient	[2]GDP (EU mean = 100)	[3]Measure of the satisfaction for the quality of life (Wellbeing)
9	Belgium	26.5	120	7.4
10	Great Britain	32.8	106	7.3
11	Germany	28.3	123	7.2
12	France	30.5	109	7.2
13	Cyprus	31.0	92	7.2
14	Malta	27.1	86	7.2
15	Poland	30.9	67	7.1
16	Slovenia	23.7	84	7.0
17	Italy	31.9	101	6.9
18	Portugal	34.5	76	6.8
19	Croatia	30.5	62	6.8
20	Lithuania	32.0	72	6.7
21	Romania	33.2	50	6.7
22	Czech Republic	24.9	81	6.4
23	Slovakia	25.3	76	6.4
24	Estonia	32.5	71	6.3
25	Greece	34.3	75	6.2
26	Latvia	35.7	64	6.2
27	Hungary	26.9	67	5.8
28	Bulgaria	33.6	47	5.5

Note:

[1]Gini coefficient is measuring the level of spread of the revenues/wealth

[2]GDP level is expressed as an index related to the European mean of this macroeconomic measure

[3]The indicator of satisfaction varies from the minimum zero, 0 (not at all satisfied) to 10 (totally satisfied) and evaluates the state of wellbeing taking into account the mood, the relationship with others and with the objectives reached, self-knowledge, economic capacity, education level and experience.

Source: European Quality of Life Survey 2012, How satisfied are you with your life these days?, Available at: <http://www.eurofound.europa.eu/surveys/european-quality-of-life-surveys-eqls/european-quality-of-life-survey-2012>, <http://www.eurofound.europa.eu/surveys/smt/3eqls/index.EF.php?locale=EN#contentpage>, Accessed 3.06.2015.

According to the scatter diagrams, the existence of a direct positive linear relationship is depicted, between the wellbeing and GDP, on one side, and of a negative inverse relationship between wellbeing and the concentration of revenues, on the other side (Figure 1 and 2).

Accordingly, a medium intensity relationship is identified between the wellbeing and the rate of GDP (the correlation of linear correlation has the value 0.65), the variation of GDP rate explaining only 42.7% out of the variation of wellbeing, holding constant the other independent variables. This depicts an average distribution of GDP within the economy, with effects in the increase of the aggregated demand, as a result of the increase of population revenues.

For the second stochastic relationship investigated, there is a weak intensity correlation between the wellbeing and the Gini coefficient, whose variation explains only 19% out of wellbeing variation (the coefficient of linear correlation has the value of 0.44). This shows

that, the rate of GDP does not express also an equitable distribution of wealth within the national economy.

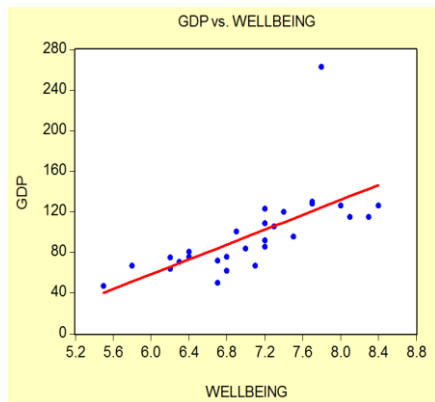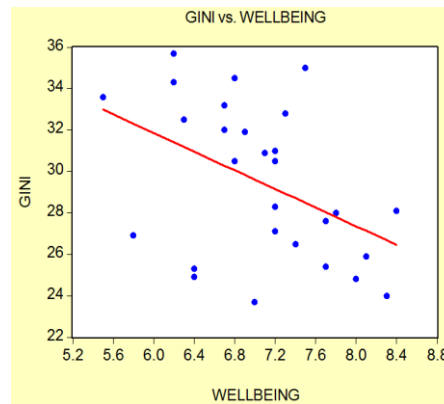| **Figure no. 1: Graphical representation of the econometric model of wellbeing as a function of the economic growth**	**Figure no. 2: Graphical representation of the econometrical model of wellbeing as a function of GINI coefficient**

From data analysis, there is rather a quantitative relationship than a qualitative one, determined by the influence of GDP which is bigger than the influence of Gini coefficient over the wellbeing, showing that the distribution of wellbeing is rather inequitable, than equitable (Tables 2 and 3).

The wellbeing variation is better explained by GDP (42%), than by the level of wealth concentration (19%). Although the models are valid for a significance level of 5%, and the regression coefficients are significant, allowing the inference to be done, for both models the intensity of the correlation is bellow medium. Therefore a model should be developed with many regressors of the wellbeing state, in order to try to increase the intensity of correlation. This is done using a multiple regression model relating the wellbeing to GDP and the level of wealth concentration, expressed by Gini coefficient.

The proposal implies the identification of a function of wellbeing which will determine an equitable distribution of wealth by transferring the positive changes of GDP into the increase of economic goods consumption utility with a direct effect upon the quality of the standard of living. In this way, favourable premises will be created for wellbeing as a positive qualitative effect of GDP growth. For the new multiple regression model it can be stated that there was an improvement of the coefficient of determination and the increase of the intensity of the relationship, as well as the validity of the model. The outputs were produced by Eviews software. The general form of the estimated equation is: WELLBEING = C(1)*GINI + C(2)*GDP + C(3). According to the regression output this equation has the form: WELLBEING = -0.04668804928*GINI + 0.01011658947*GDP + 7.454104134 (Table 4). The intensity of the correlation improved by developing the multiple regression model with two regressors, the coefficient of correlation reaching now the level of 0.7. Together, the set of two regressors are explaining almost half (48%) out of the wellbeing variation. Testing the validity of the model is done by applying the Anova method, the multiple regression model being a valid one (Prob F- statistic is a value close to zero, lower than the significance level of 5%).

Table no. 2: Econometric model of wellbeing related to the economic growth

Dependent Variable: WELLBEING				
Method: Least Squares				
Included observations: 28				
Variable	Coefficient	Std.Error	t-Statistic	Prob.
GDP	0.011669	0.002650	4.43267	0.0002
C	5.927386	0.279395	21.21510	0.0000
R-squared	**0.427171**	Mean dependent var		7.064286
Adjusted R-squared	0.405139	S.D. dependent var		0.732431
S.E. of regression	0.564904	Akaike info criterion		1.764426
Sum squared resid	8.297019	Schwarz criterion		1.859583
Log likelihood	-22.70196	F-statistic		19.38876
Durbin-Watson stat	2.167506	Prob(F-statistic)		0.000162

Estimation Equation:
WELLBEING = C(1)*GDP + C(2)
Substituted Coefficients:
WELLBEING = 0.01166905606*GDP + 5.927386252

Table no. 3: Econometric model of wellbeing related to the Gini coefficient

Dependent Variable: WELLBEING				
Method: Least Squares				
Included observations: 28				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
GINI	-0.087930	0.034724	-2.532295	0.0177
C	9.654772	1.030751	9.366737	0.0000
R-squared	**0.197841**	Mean dependent var		7.064286
Adjusted R-squared	0.166988	S.D. dependent var		0.732431
S.E. of regression	0.668486	Akaike info criterion		2.101146
Sum squared resid	11.61870	Schwarz criterion		2.196303
Log likelihood	-27.41604	F-statistic		6.412517
Durbin-Watson stat	1.680646	Prob(F-statistic)		0.017711

Estimation Equation:
WELLBEING = C(1)*GINI + C(2)
Substituted Coefficients:
WELLBEING = -0.08793019547*GINI + 9.65477208

Table no. 4: Multiple econometric model of Wellbeing in respect with GDP growth and GINI coefficient

Dependent Variable: WELLBEING				
Method: Least Squares				
Included observations: 28				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
GINI	-0.046688	0.030801	-1.515807	0.1421
GDP	0.010117	0.002782	3.636785	0.0013
C	7.454104	1.043455	7.143676	0.0000
R-squared	**0.475387**	Mean dependent var		7.064286
Adjusted R-squared	0.433417	S.D. dependent var		0.732431
S.E. of regression	0.551313	Akaike info criterion		1.747929
Sum squared resid	7.598651	Schwarz criterion		1.890665
Log likelihood	-21.47101	F-statistic		11.32707
Durbin-Watson stat	2.261413	Prob(F-statistic)		0.000315

Eventually, it can be stated that, the degree of correlation is significant and that the variables GDP rate and Gini coefficient are influencing together in a significant way the variable of wellbeing.

3. Results and discussions

After analysing the results, it can be stated that a sustainable economy is inseparable of their productive capacities, which should produce wellbeing in extensor for the next generations. The national economy sustainability is offering a macroeconomic frame favourable for the development of environmental friendly business, circumscribed to the common general interest of the community by the care for the preservation of natural resources and it is relying on substitution between different forms of natural capital and resulting from production or mainly from work, by manufacturing (Pearce and Atkinson 1998).

In general, the main charges against this position are: a) the natural capital is under-evaluated; b) many of the economic effects on the environment are irreversible, unknown and uncontrollable (Chichilnisky 1995, 1998). The macroeconomic framework analysed proves to be a generator of wealth, as a consequence of the identification of a strong correlation between the wellbeing and the GDP rate of increase, but also it was established that there is a low level of welfare allocation in the economy, determined by inverse correlation between wellbeing and the GINI coefficient. This proves a propensity for measuring the economic results by profit to the detriment of utility and of the people satisfaction with the individual participation to the wellbeing creation. The solution proposed by the paper would be the development of the sustainable businesses in order to generate an efficient allocation of resources, by removing the waste of resources, and the satisfaction of the people to become the mobile of the businesses.

The issue of resources allocation is obviously inherent, particularly because without an efficient allocation, the production value might be above the marginal, which would mean a waste of resources and energy. The authors opinion is that the resource allocation can be a part of de-growth and development paradigm, totally different from the traditionalist approach. The problem of allocation consist in the scale dimension and the intensity of growth, which produce adverse effects upon a finite eco-system as Terra, a system that cannot sustain a continuous increase of the economies by satisfying newer and newer needs.

In this context, based on the arguments referring to the need to address rationally the use of resources it is broth into discussion the ethical dimension of allocation in terms of improving the qualitative side of the economic growth. The principles of equity and efficiency can be found particularly in identifying privately the public goods (the non-competing goods). In terms of market allocation scheme, both the equity and the efficiency characterizing the transactions are not eliminated, but, in order to produce more equity, not just efficiency, it is required to have an institutional arrangement based mainly on exploiting comparative advantages. Accordingly, the macroeconomic frame supporting the business might change towards a better equity, efficient and sustainable, which seems to characterize in general the knowledge and the information society (Chichilnisky, 2001, 2006).

The negative sustainable de-growth debate is innovative. Perhaps the main problem of the types of inputs with increasing returns (knowledge, innovation and nearly all forms of complementary organizational capital) is that, it cannot be so easily separated from the so-called rebound effects. The disadvantage of Chichilnisky argument is that the

dematerialization of the national economies and the expansion of the information society are not sustainable *ep ipso*. In other words, even if the knowledge and innovation production put us in a position to generate more output, the final result does not necessarily mean that the consumption of raw materials and energy will decrease, on the contrary. A lot of studies argue favorably for generating the rebound effects accompanying the dematerialization of the national economies (Schnaiberg 2002, Schneider 2008, Apostol, 2001). This debate on the economic de-growth insists especially on the reintroduction of the economy in the perimeter of environmental sustainability through voluntary democratic decisions and refocusing the policies on the satisfaction of the basic needs and on the qualitative development (Schneider 2010). Thus, even if the economies are widely dematerializing, the incremental environmental damage is, at best, slowed down, but not avoided. The decline of consumption or the change of consumer behavior (consumer lifestyle), the resetting of economies more on development (quality) than on growth (quantity), the difference between efficiency and growth (decreasing negative growth does not mean an abandonment of efficiency, but rather means to grow beyond the limit of environmental sustainability and innovative moderation, Schneider 2010), the reopening of the discussion on the role of property for the concentration of the benefits and socialization of the costs etc, all these are major topics of the de-growth discussion. An approach to dematerialization of economies towards sustainability must inevitably be confronted with the effects of recoil or rebound (rebound effects). Or, this soon re-opens the discussion more upon the concept of strong sustainable solutions, than towards an approach based exclusively on maximizing the utility and GDP growth.

Conclusions

Reviewing of the traditional economic model of growth and development, caused by the science fragmentation and by environmental damage, comes from the development progress isolated from the natural sciences, the targets setting and various methodologies (arising from the relationship ecology vs. economy) and from the need to adapt their means and targets to knowledge and technology advance.

The studies of negative growth or contraction and the success of internalizing the environmental degradation caused by the development of a global market and of pollution rights, bring a new life into the debate on sustainability and growth.

This paper sounds the alarm that the level of GDP growth is sustainable only in relation to GDP ability to create wealth through efficient allocation of resources by initiating sustainable business based on the rationalization of consumption, and allocation of wealth on internalizing principles of eco-efficiency. Creating the macroeconomic framework favorable to the development of sustainable business model requires consideration of negative economic growth (de-growth) and insurance policies satisfaction of basic needs and the qualitative development.

The use of the model, consist in identifying a positive correlation between the economic growth and wellbeing only when the society resources allocation respects the social effectiveness principles, a fair distribution of wealth, respectively. The principles of revenues or wealth allocation, taking into account the social justice and equity have, on one hand the advantage of the public policies functionality according to the productive capacity

of the economy, but also the advantage of assuming strong sustainability policies, in line with the principles of eco-economy and of the sustainable development.

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