

## **The Law of Entropy – the Most Economical of All Natural Laws. Current Manifestations of World Economics**

**Nița DOBROTĂ**

Bucharest Academy of Economic Studies

**Adrian VIERIȚĂ**

Bucharest Academy of Economic Studies

avierita@gmail.com

**Abstract.** *The last three centuries have witnessed a specific social evolution, one much more dynamical than those of the previous era. The general vector of this dynamics is represented by the progress in technology and science that had taken place in all arrays of social action, a phenomenon largely manifested throughout Western European countries and North America. It is against this general setup that the world saw the formation and development of both European national communities and of the capitalist market economies, two of the historical causes that lead to the fall of the feudal social and economical system.*

**Keywords:** economic law; entropy; economic growth; social evolution; technological and scientific progress; market economy.

**JEL Codes:** A12, D80.

**REL Codes:** 1A, 2A, 3A.

During the first two centuries that followed the birth of capitalism, the condition and dynamics of the national communities were being observed and valued through the lens of economic activities and economic results of individual economical entities.

When needed, especially when war against other countries was envisaged, the state authorities would turn to coagulate the individual economical conditions and results to national dimensions. That is, the economical approach of those countries already heading for capitalism was a micro-economical one. Hence, in the absence of macro-economical science and of economical growth theory, we cannot speak of proper economical growth – in its macro-economical sense – taking place during this particular two centuries of our history. Taking into account the existing historical conditions and the empirical preoccupations of the state authorities of those times, one can righteously but refer to the pre-history of economical growth.

John Stewart Mill, the last of the classical scholars of economics, makes some meaningful remarks about this last issue. “There is a progressive movement – writes the English economist – that has been transmitted without cease from one year to the next, from one generation to the next, a growth in wealth, a growth in what is called material prosperity. The main causes that lead to the efficient use of the material and human resources have been and still are the free initiative of the capitalist entrepreneur, of the micro-economical players, and the competition market” (Mill, 1992).

In order to arrive at the state in which economical growth is seen as being a process that defines the dynamics of national economical systems, there were two other historical conditions that had to be met: the intervention of the democratical bourgeois states within the overall economy of the countries and the formation of firm macro-economical structures. Moreover, these two new conditions had to also find their reflections in the theoretical field – which happened through the writings of John Maynard Keynes that, in his classical work, *The General Theory of Employment, Interest and Money* (1936), layed the foundation of macro-economical theory. Only after all these new conditions have been met and integrated, can we speak of a macro-economical approach towards the economical problems of the capitalist countries and also of growth theory, combined with adequate macro-economical policies.

During the post-war years, up until the 1970's, the macro-economies of the developed countries have represented favorable grounds for the manifestation of a special kind of economical growth. Those were the times in which there appeared numerous methods of economical growth, whose main ingredients were labour and capital in all their different avatars: technical progress, technical and scientific revolution, organisation and management of labour.

In all three of the afore mentioned domains, the offensive over primary natural resources and over nature was generalized. We must bear in mind the fact that the most important economical growth rates were achieved by those countries which showed most aggression towards the natural environment. The social and economical theories have not been convincing enough nor effective enough to point out the global threat represented by the behavior of the economical players that were un-discerningly exploiting the natural resources of our planet, without thought of their limited amount or their incapacity of regenerating over short and medium time spans.

During the last two or three decades, the limitations of this type of economical growth have started to show themselves and more and more specialists have begun to speak about the deep crisis it had brought about. The main cause of this particular crisis is to be found in the aggressive manner of the planet's human inhabitants – especially that of the private producers of goods – in which they relate to Earth itself.

These circumstances lead to the rise of some fundamental shifts in what the place and the role of production means were concerned. All of the production means (primary, traditional, neo-factors) have underwent structural, qualitative and quantitative changes. But the transition from the prevalent macro-economical view upon the economical dynamics of countries to the world-economics approach of the said processes has been mainly determined by the fundamental role that all primary natural resources had always played within the economies, position that has been increasingly damaged by a certain type of economical growth.

In their work on *Macroeconomics*, American authors Rudiger Dornbush and Stanley Fischer emphasize the fact that, during the last decades, there are three fields in which major changes are obvious, changes that bring about the need for a more world-related economical approach of contemporary economical growth. These three fields are the following:

- Firstly, the monetary market of today is dominated by the fact that most of the money is being used for payments of the interest rates, situation which dramatically changes the traditional points of view concerning the demand for money.
- Secondly, the budgetary deficits and those of the public debts are (or have become) a central issue of today's macro-economics.
- Thirdly, “the economic results from the international markets hold a decisive role in nowadays macro-economies. Twin deficits, the condition of the dollar, the crowding out phenomenon in the event of a sudden development of exports, all of these represent the key elements of a balanced evolution of the economy” (Dornbush, Fisher, 1997).

Acting according to the spirit of the theories and the economical growth models from the first post-war decades, the countries of the world, mostly those economically developed, have created the conditions that would later lead to the crisis of that very same type of economical growth. “The human and natural crisis of development on planet Earth can be interpreted as a complex, profound process that globally stresses upon the incompatibilities between the man-made environment and the requirements of the constant factors belonging to the natural environment, between profit understood in its monetary meaning and the social and human aspect of gain, incompatibilities that endanger the balance of the dynamic stability between economical efficiency, social justice and the equality of opportunities among generations” (Economie, 2009).

Certainly, this particular behavior of economical agents, both private and public, continued to manifest itself even after many scientists, research institutes, UN institutions and civil activists have drawn attention both upon the limited dimension of primary natural resources and the unavoidable planetary perils which can appear in the absence of firm measures towards the global re-thinking of the existent pattern of growth.

In the following relatively autonomous chapters, we shall analyze the main aspects of the facets, limits and perspectives of economical growth and those of social development and of their forms of manifestation from a world-economics point of view.

### **1. The limitations of post-war economical growth in the light of the Law of Entropy**

Most specialists in matters concerning macro-social growth and development consider Nicolae Georgescu-Roegen to be the one who theorized the concept of economical growth while taking into account of the natural environment. In his 1966 paper, *Analytical Economics: Issues and Problems*, he demonstrated that the mechanistic dogma contained a fundamental error which, once integrated within the economical thinking, bears its consequences upon ecology and society and which affects a human race that finds itself launched in the unconscious orbit of limitless economical growth.

Nicolae Georgescu-Roegen considers that the neo-classical economic model is built upon the Newtonian mechanic paradigm and does not take into consideration the principles of energy and matter degradation. He considers that we must take into account the paradigm of thermodynamics and adds to his economical model the Law of Entropy (the second principle of thermodynamics), named by the Romanian scholar “the most economical of all natural laws”, while warning about the fact that “in terms of entropy, the cost of any biological or economical venture is always greater than its result. In

entropic terms, such activities necessarily translate into some sort of a deficit” (Georgescu-Roegen, 1979).

Considering the three sources of entropy that, when combined, become the source of life on Earth – the free energy received from the Sun; the free energy from inside our planet; the orderly structures of Earth – it is of paramount importance that humanity should manage its entropy deficit towards a bearable level and, implicitly, to identify those growth solution that could ensure the alternatives it needs in order to achieve a maximum lifespan on Earth.

The correlation between world economy – as perceived through the lens of contemporary realities of the economically developed countries – and the limited nature of Earth’s primary resources has been firstly analyzed and assessed by the Club of Rome. The Club of Rome has been established in 1968 as a think-tank by a group of scientists, sociologists, economists, statisticians and international high dignitaries, at the initiative of several international groups originating from some 53 countries. (The French web-site of the Club of Rome states that the decision regarding the establishment of this non-governmental organization has been adopted at David Rockefeller’s initiative, taken during a work-group session that was unfolding at his residence in Northern Italy. Its purpose was to act in favor of the dissemination of ideas regarding a “New World Order”).

The association owes its name to the fact that its first reunion, the one that has actually started it, took place in Rome, Italy, in April 1968.

Following its establishment, the Club of Rome contacted a group of scientists from the US based Massachusetts Institute of Technology, asking that it produces a study that emphasizes the consequences of economical growth upon the planetary decay (pollution, lack of raw materials, destruction of ecosystems). The first results of their research has been publicized by the Club of Rome through their famous 1972 paper, *Limits to Growth*, also known as “The Meadows Report”, after the name of its two main co-authors: Donella and Dennis Meadows.

The Meadows Report has put into light the consequences that shall bear upon our planet should we continue the type of economical growth that was prevalent during the first post-war decades. The five variables that were taken into account were the following:

- the acceleration of the industrialization process at a global scale;
- the population growth of the planet;
- malnutrition due to poverty;
- the dependency of the economy upon the non-renewable natural resources and the acceleration of their exploitation;
- the degradation of the natural environment.

Following this analysis, the authors of the Report stated that, should the general tendencies of acceleration of the industrialization process and of demographical growth – that were manifest throughout the sixties and seventies – continue, during the next one hundred years of our history, the ecological limits of the planet would be reached, thus triggering an uncontrollable, speedy decline in the world population and production capabilities that would completely churn the human existence.

In order to avoid this situation, the authors of the Report recommended the substitution of growth with an equilibrium state (zero growth), whose purpose was the stabilization of economical activity and demographical growth. The Report also recommended a possible development pattern that would no longer be defined in terms of growth – growth seen as unceasing desire of infinite accumulation within a world of limited resources – but would find its definition within understanding and acceptance of the process as a state through which there would be an enhancement in the humanity's capabilities of ensuring the well-being of its members, while respecting the ecological balance that nurtures all life (the website: *Le developpement durable: repers historiques*).

In the latest of its revisited issues, dating from 2004, the authors take into consideration two concepts that did not appear in the first edition. The two are the need for sustainable growth (concept that was launched by the Brundtland Report in 1987) and the "Ecological footprint" which attempts a calculation of the human impact upon the planet. According to the new calculations, Earth's capacity to sustain us has been surpassed starting from the year 1980, and in 2004 it had already reached a 20% overload.

The latest report of the Club of Rome reminds us of a fundamental idea according to which Earth is not infinite, nor as a reserve for limitless resources (land for agriculture, drinkable water, oil, natural gas, coal, minerals etc.), nor as a deposit of human waste and residue. Moreover, the permanent demographical and industrial growth implies both the consumption of non-renewable resources and pollution.

This scenario is being taken into consideration by the authors of the latest Report, the one from 2004, in order to fundament their conclusions. These are numbered from 0 to 10 and start out with the unlimited input-output scenario, continuing – among others – with the crisis of non-renewable resources, the crisis of pollution, the food crisis, the soil erosion crisis, the cost crisis, family planning, modernization of the general life style, more efficient usage of natural resources.

The authors of the Report have realized that the economical and social changes that should accompany the desiderates they had envisaged – and thus reaching the desired balance – must happen at an enormous scale. This is why, by accepting the idea that Earth's resources are limited and the negative effects

of the limitations of growth shall be the more disastrous the later humanity shall act upon them, the Report is trying to tackle the possibility of a long lasting *sustainable revolution*.

The authors remind us that human history has already seen in the past such long-lived revolutions, similar to that which they are envisaging. The example being used is that of the *agricultural revolution* that determined the settlement of the nomadic tribes of the planet through the practice of agriculture and raising livestock, leading in the end to the transition from the Paleolithic to the Neolithic. For the later part of human history, we are reminded of the *industrial revolution* that contradicted the catastrophic theory of Reverend Thomas Malthus, according to which the numbers of the population grow in geometrical progression, while the resources needed for their existence grow in arithmetical progression.

Compared to the previous revolutions from the history of humanity, the *sustainable revolution* shall have to rely on the fact that humanity is aware of its necessity and also on the agreement of Earth's inhabitants regarding the objectives that need to be reached. According to the Club of Rome Report, a sustainable society needs to be characterized by solidarity and by the fewest number of inequalities possible.

Even from its first edition, the Report concerning the Limitations of Growth has stirred many controversies and contestations. In one of the editorials of the 13<sup>th</sup> of March 1972 issue of Newsweek, the American economist Henry Wallich defined the "Limits to Growth" Report (which was being published under the authority of the Smithsonian Institute from Washington) as being "a piece containing approaches that were irresponsibly nonsensical", that did not offer enough data for many of the variables used within the models that represented the foundation of the analysis<sup>(1)</sup>. Wallich states that "the quantitative elements of the model can only be found within the authors' imagination, and the authors have never revealed the equations they have used for this purpose" (the web-site Limits to Growth – Criticism).

Similar criticisms have been made by the Nobel Prize winner Robert M. Solow, who emphasised upon the small amount of data that was being used when formulating the predictions from the Limits to Growth Report. In his review of a book on environmental issues written by Bjorn Lomborg, the American Federal Judge and essay writer Alex Kozinski makes some considerations upon the Limits of Growth Report, naming its authors „a group of scientists with a pretentious name, the Club of Rome" (Alex Kozinski, born in 1950 in Bucharest, has been appointed Federal Judge of the US Appeal Court in 1985, by the American President Ronald Reagan; he writes essays and comments mostly upon judicial matters).

## 2. The world crisis of the current type of economical growth, from the perspective of nature as a production factor

During the last decades, there have been some fundamental changes regarding the place and the role of the production factors. There appeared quantitative, structural and qualitative changes of all these factors. But the progression from the mostly macro-economical approach of the dynamics of the national economies to that of a world economy is due to the modification of the role of natural primary resources.

Generally speaking, the social and economical sciences have analysed *the role of the natural resources through the lens of nature as a primary production factor*. „The natural factors – said the French economist Michel Didier – are a given of the Universe: earth, minerals, oil, extra-terrestrial space. The natural factors are not gratuitous, they have to be put to use. But, through their mere existence – to which we have no saying or role – they allow the construction of several branches and an entire chain of usages that would otherwise be impossible in their absence. But the natural factors are not infinite. This is why we must remind ourselves the debate upon the natural limitations of the economic growth” (Didier, 1994).

We have considered that, through these statements and emphasis belonging to M. Didier, there rises an entire vision of nature as primary production factor and, hence, we have chosen them as a kind of motto of the present analysis. The largest part of nature that has always been used by humans is *land, especially the soil which, from an economical point of view, also includes the water*. All human activities are linked in one way or another, directly or indirectly, to the Blue Planet.

As primary production factor, land is defined by a few characteristics that set it apart from the other production factors and economical resources. These very specific features of nature are those that generated the new kind of approach and analysis of the dynamics within the national communities' economies.

(a) *Land is an element that had preceded the human existence, something man has not created himself*. This feature means that:

- it is the place of birth and the home of human society;
- it has always been a material fundament of any activity and is the very substance of all its results;
- it has been and still is the primary source of non-renewable resources and, periodically, reserve of renewable resources (usually on a yearly basis, along the geographical areas of temperate climate);
- finally, land represents the primitive arsenal of all working utensils<sup>(2)</sup>.



Seeing all these aspects through the lens of creationism, we could say that land is a divine gift, the primary „dowry” of the first humans.

(b) *Land is a durable and theoretically indestructible element.* This must not be mistaken for agricultural parcels or real estate, either privately or publicly owned. It must neither be reduced to the amenities made by humans and incorporated on the soil or inside Earth’s surface, which are considered as *land – accumulated capital*.

(c) *Earth is a limited resource,* it has its own place within the solar system, its surface and its mass being constants, land as a production factor being virtually scarce.

The economical problems regarding the production factor – nature – are mainly found in the analysis and appreciation of economy’s primary sector, which includes: agriculture, forestry, fishery, mining of all sorts etc. In the end, the role of the natural factor manifests itself through the influences of the actual environment upon the economy, the environment being a mixture of its elements: geography, climate, hydrology, pedology, geology etc.

*As mere soil reserve (agricultural parcels, natural grazing lands, vineyards, orchards, forests, lakes), land performs a few essential and very specific functions, such as:*

- foundation and vital environment for all terrestrial plants („universal germinative layer”);
- main source of nutrients and energy reservoir for all living organisms;
- regulator and receptor of humidity within the soil-water-plants system.

All of the above, together with the fact that these elements are not equally found all over the world, their abundance and/or their lack within the boundaries of different human communities, have generated multiple and contradictory effects upon peoples and/or nations.

The existence in some areas of natural resources that were rich in active substances have motivated the population to use those resources in order to serve its economical development and social progress. There is also a theory stating that abundant natural resources have had twisted results on local populations, that came to grow only by the means that nature offered them in order to survive.

At any rate, earlier history, just as the more recent one, offers us enough examples of solving the great inequalities of natural resources repartition through migrations of large masses of people, through conquests of foreign territories, through (either cold, or hot) wars aimed at the acquisition of natural resources or wealth created by humans along their history.

The starting point for the defining and characterising of the production factors is represented by the *economical or production resources*: the entirety

of the available means and of those that are susceptible of being put to use in the production of material goods and in the rendering of services. As much as they are attracted and used in the economical activity, the available resources appear as fluxes seen as services of the production factors.

However, as J.M. Keynes observed, the actual theory of the production factors – which implies the use of available resources – has only rarely been the focus of considerate studies (Keynes, 1970).

Currently, in order to turn economical resources into production factors, one needs economical and judicial institutions that are specific to market economies.

Under contemporary conditions, natural resources – including nature as a production factor – are regarded as stock, appreciated and evaluated as *elements of the national wealth, but also as fluxes, as factors of the natural environment that surpass the boundaries of the countries' economies regardless of their dimensions*.

In some synthetic writings (treaties, dictionaries, manuals), the primary natural resources are considered to be components of the national wealth, together with the human resources, the spiritual resources (the reserve of science, the reserve of education etc), the man-made physical resources that people have created and accumulated. Within this frame, natural resources are made of: the agricultural surface, the woodlands (raw wooden mass), the fishing and hunting reserves, the resources of useful mineral substances, the hydro-energetical resources, the continental platforms of the seas and oceans.

The advantages of regarding natural resources as part of the national wealth reside in the fact that national political decision-makers are made responsible for the protection of the natural environment and for the most efficient economical, social and ecological usage of each country's natural resources.

The main limitation of analyzing and appreciating of the primary natural resources just from a macro-economical angle has to do with the fact that, nowadays, many problems that are related to their usage and protection can only be tackled and solved from a planetary, global level.

This is why we have chosen to approach the issue of natural resources both from the environment perspective, as natural environment factors whose management surpasses the borders of any single country (even in the cases of those countries with great economical strength), and from the perspective of countries' economies, of their national wealth. This being the case, we have concentrated our attention upon resources as natural, environment factors, whose components are assessed by specialists as a structure: 1) air (the atmosphere); 2) water; 3) soil and subsoil; 4) forests, terrestrial and aquatic flora; 5) terrestrial and aquatic fauna; 6) nature reserves and monuments.

Analyzing the issue of natural resources as environmental factors within the context of today's strong tendencies towards globalization, certain authors have reached the conclusion that, through their general role, these have generated some structural mutations within the world economy, having a great impact upon the macro-economies and their dynamics. These mutations have been classified by specialists as follows:

- a) the “cut-off” between the primary products economy and the industrial products economy;
- b) the production processes have cut-off themselves from the labor force, from the mechanisms that lead to the formation and the improvement of the labor resources;
- c) the movements of the financial capital have become the main force behind the world economy: these movements have not yet managed to separate themselves from the trade of products and services, but the connection between these world-wide fluxes is getting weaker and weaker;
- d) The nature of the markets is changing considerably, as they cease to be “meeting points” for the participants and become more and more some sort of operational “networks” (Munteanu, 1995).

These new elements do not raise questions upon the paramount importance of natural resources in the bigger picture of economical development and social progress. On the contrary, the mutations of which we have spoken emphasize even more on the *vital role played by nature in the life of humanity*, achieving and maintaining the natural and social balance on planet Earth.

Nowadays, the main slogan is “to be or not to be” society as it is today, while humanity has to choose between the continuation of economical growth at higher and higher paces (while more and more questions arise concerning this possibility) and/or a controlled evolution that would make possible to channel the economical results of national communities in order to avoid any dramatic collapse of society.

Being a phenomenon (process) that is characteristic for the extra-territorial expansion of investment and financial capitalism, the trans-national feature expanded further and further has greatly questioned the unity and the coherence of the principles, rules and procedures of production and that of making the best possible use of the material and non-material resources. Also, this process has in turn generated new ways of looking at what we call a *national system*: national government, national sovereignty, national bank, national education, national culture etc. (Bonnefous, 1976).

Robert Reich, an American economist and politician, upholds the view of French author E. Bonnefous, making some remarks upon the relation between

the national and the global factors in the contemporary world but also in the future world. “There will be no national economy left – says Reich – or, at any rate, these will cease to be the same with what we designate through this notion. All that will be left as fixated inside the national boundaries will be the people forming the nation. The main wealth of a nation will reside in the abilities and the ingenuousness of its citizens. The main political task of every nation will be that of resisting to the centrifugal forces of the world economy.” Using the American model as exemplification, Reich continues: “The fundamental problem is the future of the American society taken separately from the American economy, and the fate of most of its citizens which loose when faced with the global competition” (Reich, 1996).

The trans-national feature – for this is what it is all about – keeps its course, marking the beginning of the post-national era in which companies assume the prerogatives of the state, while the state behaves more and more similarly to a company, supporting the efforts of its “national” companies to expand out from their native territories.

Within today’s society, regardless of how it is being called, the complex problem regarding natural resources has become the object of vast scientific analysis and of fierce political and ideological feuds.

Scientists have somewhat outlined a certain consensus according to which “The natural-human crisis of the development on Earth can be interpreted as a complex and profound, global process of deepening incompatibilities between the man-made environment and the prerequisites of the natural environment, of the incompatibilities between the monetary and the social and human profit” (Mesarovici, Pestel, 1975).

It is obvious for anybody that the environment that man has created and, more recently, the monetary profit of some individual and/or national entrepreneurs have triggered and upheld economical growth that was unsustainable from the point of view of the immutable prerequisites of the natural environment. The social and economic growth and development have been conceived and promoted without any rational correlation to „mother nature”, to its mere existence.

„As all scientific abstraction, the concept of economic growth simplifies the real process of the economic dynamics. The real process is reduced to its simple economic and quantitative aspects.” (Braudel, 1989, p. 104). The effects of such reduction and of the narrow-minded economical policies have come into the light during the last decades, mainly during the historical period that followed “the three glorious post-war decades”. Under these circumstances, the world economy evolved towards globalisation and manifested the crisis of the current type of economic growth even more harshly and obviously.

Taking place against the background of limited and mostly non-renewable natural resources, the process of growth has not been, is not and shall not be a continuous set of circular fluxes whose main points of interest are production and private final consumption. This means that:

- on one hand, economical growth and development depends upon the natural environment and upon its very quality;
- on the other hand, any economical activity, any social action triggers losses of balance among the relations of nature and economy, between humans and their natural environment.

This interdependency relation between the economic activity and the natural environment is highlighted through notions such as entropy, entropic, anti-entropy. As it has been shown, the scientific pioneer of this domain is the Romanian-born American economist of international acclaim Nicolae Georgescu-Roegen. Generally speaking, entropy represents the process of degradation of energy within a certain system from the universe. Economically, entropy refers to the process through which physical and energetic resources become degraded, process which occurs both through social and economic activities, and in its absence. In other “terms”, entropy means the *transformation of free energy in energy that is used within the economical process*. As such, low entropy becomes high entropy, having negative effects over humanity and the universe. *Low entropy* has an orderly structure and is (or could be) used by people within the economical processes. High entropy represents a totally or partially linked energetical structure, having a random, unusable pattern. Throughout the universe, there is always a continuous, general, irreversible decay of the free energy, which is being put into order by nature itself and becomes linked energy.

Because, by fault of their very nature, the economical processes have an *entropic character*, humans must (or should) act in accordance with the laws of nature, to impose an *anti-entropic character* to their actions. More and more researchers come to realize that humans, through their actions, have come to accept the entropic processes that have become dangerous for the entire human race.

“A human being – writes N. Georgescu-Roegen – can only avoid the entropic degradation of its own structure. It cannot stop the rise of entropy within the entire system, made up from its very structure and the environment. On the contrary, as far as we know today, generally, the entropy of a system rises faster when life exists within it rather than when it is absent” (Georgescu-Roegen, 1979).

The relation between social and economical development and the natural environment and, most of all, the current lack of balance between these two entities have been understood and tackled in very different manners. Hence,

from this situation arose three main approaches: geo-central, bio-central and anthropo-central.

Keeping in mind the rational elements existing within the aforementioned approaches and using the fundamental writings concerning the relations between the natural environment and the economic growth, one can formulate (and there are serious attempts in this direction) a synthetic concept which would contain the imperative reconciliation between man and nature and man and his own self and actions, in accordance with what nature itself can offer to mankind<sup>(3)</sup>.

The coordinates of this concept should be: respect towards the laws of nature while performing economic activities; respect for the ecologic balance, for Earth's health; large-scaled, coordinated actions in favor of the economic progress that is also beneficial to humanity in general.

We can say that the current processes of economic growth, in all countries and in each of them, have become more and more entropic. But the transition towards an economic process that has a global, anti-entropic character, is no longer likely if not through a change of perception, thus through a global approach and through actions that entirely match this vision.

### **3. Economic decrease – an attempt to demonize the entropic economic growth**

The French professor Serge Latouche has a special place among the specialists that favour the existence of a model of contemporary economies' dynamics for each particular country, but also from a global point of view<sup>(4)</sup>.

On one hand, the French economist uses original arguments in order to demonstrate that economic growth of the kind we are experiencing today is no longer a viable option and that the environment in which we live has obvious limitations to which we must ultimately pay attention. On the other hand, he makes a series of reasonable propositions whose target is moving past the crisis that was brought about by the pattern of social and economic development used in the developed capitalist countries in the decades following World War II.

At the core of professor S. Latouche's thesis lies the concept of economic decrease, which he had trustfully and perseveringly fundamented and popularized. The problems that the new type of economical dynamics brings about, representing an acceptable alternative to the economic growth with no natural limitations, have been tackled and analyzed in a number of the author's writings: *Survival in the Face of Development* (2004); *The Bet of Economic Decrease* (2006); *Decreasing Economy – Essays and Interviews* (2007); *A Short Treaty upon Economic Decrease* (2008). Furthermore, the author of the aforementioned books has taken part in numerous international scientific reunions, where he presented his view of to what economic decrease should be and to what would be the ways through which humanity could achieve it.

“Up until now, in a world of limited natural resources, the dominant paradigm has been that of infinite growth. It is necessary that we change this paradigm before we are crushed by the very limits of nature”, wrote professor S. Latouche. In a world in which the natural resources are limited, one cannot achieve infinite growth, concludes the French author (Latouche, 2006).

In fact, as he admits in the foreword of his work *The Bet of Economic Decrease*, the term “economic decrease” represents a defiance, a challenge addressed to all social, economic and political players of the world. In other words, the economic decrease that he brings to our attention is not the fundamental concept of a new theory regarding the current and future economical dynamics, but a slogan.

For accuracy’s sake, we should use the term “growth” in the same manner in which we use the notion of “atheism”. If the concern for economic growth has become a cult, a religion with its own specific rituals – writes the author – then the preoccupation for economic decrease is one form of opposition to this cult.

After synthesizing professor Latouche’s concept regarding decrease, we come to realize that what he suggests is a re-thinking of the current situation of our societies by adopting another social logic, one that would try to build a sustainable society through:

- modification of the current concepts and values;
- modification of structures;
- re-localisation of economy and livelihood;
- profound modification of the current pattern of product consumption.

Indeed, through his vision regarding decrease, professor Latouche launches a challenge. His thinking doesn’t leave out the idea of welfare, but he states that it is necessary that we reach to a new paradigm of welfare, a more intelligent and rational one from a social point of view, but also from an ecologic point of view. The production system would undergo a through re-structuration, in order to mutate to other ways of producing goods, ones that do not affect the survival of the planet. Production will have to result from putting into practice of the ecologist footprint, not forgetting about the bio-productive environment – meaning the environment that allows us to live with what we produce ourselves in limited quantity.

According to professor Latouche’s theory, the process through which we could achieve a society of decrease implies a number of eight inter-related objectives, which he called the eight R’s: re-evaluation, re-contextualisation, re-structuration, re-localisation, re-distribution, reduction, re-usage and recycling. In time, putting all eight principles into practice could reduce the negative effects of infinite growth and to lead to a serene, convivial and peaceful decrease. We shall now try to synthesize the ideas behind the eight objectives, in order to understand the almost complete view upon the future society of economic decrease.

(1) Through re-evaluation, the author proposes the re-thinking of the values in which our current society believes and which lay at the very foundation of how we organise our lives today. Cooperation should prevail over competition, altruism over selfishness, local interests over global interests, the problems of social life over limitless consumption. This re-evaluation has to go beyond the imaginary world in which we live, with its systemic values, risen and fed by the system itself and which, at their turn, further strengthen the said system.

(2) Re-contextualisation implies the modification of the conceptual and emotional context of a situation that is lived in such a manner, that its meaning is completely changed. For example, such a change is needed in regard to the concept of wealth and that of poverty, or in regard to the concept of lack and that of abundance. Besides, our current economy transforms abundance into crisis and artificially creates penury and needs by taking over the nature and putting it up for sale.

(3) Re-structuration implies that, in accordance to the shift in the values of the economic and productive structures, we adapt our patterns of consumption, our social interactions, our life-styles and we turn them towards the continuous decrease society. The more radical this re-structuration shall be, the faster shall our current dominant values loose their systemic features.

(4) Re-localisation implies, according to the author, meeting the demand of the consumers only by means of local products which were made by companies that are supported by the local economy. As a consequence of this situation, any decision that has economic consequences would be taken locally. The moving of goods and capitals should be reduced to a minimum, in order to avoid the costs generated by transportation but also pollution, the hot-house effect and climatic change.

(5) Re-distribution aims to guarantee acces to the available resources for all the inhabitants of the planet and a fair distribution of wealth, ensuring a satisfactory degree of employment and decent life conditions for everyone.

(6) Reduction of the human impact over the biosphere by re-dimensioning of production, consumption and working hours. The consumption of resources must be reduced and corelated with Earth's limited resources.

(7) Re-usage implies getting over the consumption obsession we have about objects becoming obsolete and our constant tendencies to purchase new products, but instead, getting used to repair the household objects and other goods and stop throwing them away while they are still capable of functioning.

(8) Recycling should try to make sure that any object from the category of waste and refuse, derived from human activity and which cannot be further de-composed, shall be recovered in order to be re-introduced in the economic circuit.



After following these eight objectives that, according to the author, should be able to ensure an economic decrease without perturbation, the question that arises is: how achievable are these? Even though professor Latouche admits that decrease is not an economic concept – such as is economic growth, with its theories and models that fit it – but a slogan which, even if considered blasphemous by some, represents none the less a challenge in a good way.

Obviously, should this slogan be ever put into practice, the entire human society and its existent patterns that were developed gradually throughout our history would undergo a general turmoil. *The reduction of physical quantities that are being produced and of the resources that are being used only refers to the industrially developed countries that have contributed in a decisive manner to reaching the standards of our contemporary society.*

In our opinion, the analysis of the future transformations of human society makes us believe that it is not just a theory related to the quantitative aspects of the decrease process, but also a complex transformation of the social, economical, political and – first and foremost – individual and collective thinking. It is not a one-way action targeted against the idea of economic growth, but a change of paradigm.

We consider that, even if the only prerequisites taken into consideration should be those of “re-contextualisation” and those of “re-structuration”, at the level of human perception that exists during the current step in our evolution, *it is obvious that these have a utopian character and that it would be impossible to translate them into reality.* Even in the absence of a luxurious imagination, when we take into account the prerequisites for re-location, it is impossible not to think about the phalansters of the medieval guilds that was being proposed in the XIXth century England by John Ruskin, obsessed with the idea of not loosing the ties with the past and with the fact that the effects of industrialisation were de-humanizing.

Certainly, it is not the first time in history that attempts of such experiments have occurred. We can remember the slogans of the 1789 French Revolution, that of liberty, equality and fraternity. Then, even the ideas of the utopian socialism and, more recently, the doctrine of the failed socialist systems throughout the countries of Central and Eastern Europe. After 70 years of Soviet Union and 45 years of Eastern Block, these ideas proved to be non-viable.

What lacks amid the postulates and concepts of professor Serge Latouche concerning economic decrease is any reference to individual freedom which, as we already know, represents the most important factor in any democratical society.

---

## Notes

---

- <sup>(1)</sup> Henry Cristopher Wallich (1914-1988), Yale University economist and American publicist, member of the Federal Reserve System Governors' Board between 1974 and 1976.
- <sup>(2)</sup> See *Tratatul de Economie Contemporană*, vol. I, Editura Politică, București, 1987.
- <sup>(3)</sup> See Niță Dobrotă: *Economie Politică*, Editura Economică, București, pp. 325-326.
- <sup>(4)</sup> Serge Latouche is a professor in economical science at the University of Sorbonne and at the Institute of Science and Socio-Economical Development in Paris.

---

## References

---

- Blaug, M. (1992). *Teoria economică în retrospectivă*, Editura Didactică și Pedagogică, București
- Dornbush, R., Fisher, S. (1997). *Macroeconomie*, Editura Sedona, Timișoara
- Georgescu-Roegen, N. (1979). *Legea entropiei și Procesul Economic*, Editura Politică, București
- Didier, M. (1994). *Economia: Regulile jocului*, Editura Humanitas, București
- Tratatul de Economie Contemporană*, vol. I, 1987, Editura Politică, București
- Keynes, J.M. (1970). *Teoria generală a folosirii mâinii de lucru, a dobânzii și a banilor*, Editura Științifică, București
- Munteanu, C. (1995). *Investițiile internaționale*, Editura Oscar Print, București
- Bonnefous, E. (1976). *Omul sau natura*, Editura Politică, București
- Reich, R. (1986). *Munca națiunilor: Pregătindu-ne pentru capitalismul secolului al XXI-lea*, Editura Paideia, București
- Mesarovici, M., Pestel, E. (1975). *Omenirea la răspântie, Al Doilea Raport al Clubului de la Roma*, Editura Politică, București
- Braudel, F. (1989). *Piețele naționale, în Timpul Lumi*, Vol. I, Editura Meridiane, București
- Latouche, S. (2006). *Le pari de la décroissance*, Paris
- \*\*\* (2009). *Economie*, Ediția a 8-a, Editura Economică, București
- <http://> Le develeppement durable: repers historiques