

# RECONSIDERING THE CONCEPT OF ECONOMIC TIME ACCORDING TO THE SUSTAINABLE DEVELOPMENT PARADIGM

Alina Georgeta AILINĂ<sup>112</sup>  
Florin BĂLĂȘESCU<sup>113</sup>

## Abstract

Time, a fundamental element of everyday life, has preoccupied for thousands of years the world of physics, theology, psychology, and universal philosophy. It may overlap or not over economic time. On the other hand, the concept of sustainable development presents itself as a solution to the ecological, economic, social and political crisis of today requiring reconsideration of the quantity and quality of natural and industrial resources and the reconciliation between social and economic progress and nature. To this end, in order to improve the methodological and instrumental palette of the economy, this article proposes a constructive theoretical analysis of some fundamental concepts that underlie the description of the economic process calibrated for the sustainable development paradigm: time, sustainable development, time-space coordination, economic process. Therefore, this article proposes to reconsider the concept of economic time from the perspective of the sustainable development paradigm providing a theoretical basis for other theoretical or organizational-operational developments related to the economic process.

**Keywords:** time, sustainable development, economic process

**JEL classification:** A12, B40, Q01

## Introduction

The paper proposes an analysis of some fundamental concepts underlying the description of the economic process: time, time-space coordination, sustainable development and economic time. In this analysis, we will also channel to emphasize the importance of reconsidering economic time from the perspective of sustainable development paradigm. Our approach is motivated by the literature shortcomings on the concept of economic process and especially on economic time in the context of the increasing complexity of global, regional and local social, economic and political realities, highlighting the need for theoretical and methodological developments.

Time is a fundamental element of exact sciences (especially physics and chemistry), but also in philosophy, theology and metaphysics. It is a measure of the duration of/between events and the context of time definition is almost always very important. In the sense of classical physics, time is a continuous phenomenon, but by its theories in quantum mechanics it is disputed this quality, insisting that only space-time relationship is continuous (e.g. Einstein has shown that the time elapsed for a resting body is longer than the flowing time for an observer on a moving body, as well as the fact that the longer we are at a greater distance from Earth, the faster time passes or the fact that at a higher altitude the time is leaking faster - the concept of gravitational temporal expansion). In philosophy, time is an uninterrupted flow that goes in one direction, from the past to the present, defining the framework for the nature processes. But time can be defined with difficulty in any science, being an abstract physical size, a purely human construct defining the duration of events or between events. In classical mechanics time is not correlated with the observer or the experimenter, it is also considered to be independent of space, of phenomena or of occurring events and that it is homogeneous (it always flows as fast). In relativity theory, however, time is no longer independent of the observer, but rather the space-time relationship and matter influences the form of space-time coordination. As Hawking (2001), remarked, "We must accept that time is not completely separate and independent of space, but combines with it, forming an object called space-time". Also in physics, there is a lively discussion about the expansion or contraction of time

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<sup>112</sup> "Victor Slăvescu" Centre for Financial and Monetary Research, Romanian Academy, Bucharest, email: [alina.glod@gmail.com](mailto:alina.glod@gmail.com)

<sup>113</sup> "Victor Slăvescu" Centre for Financial and Monetary Research, Romanian Academy, Bucharest, email: [razvan\\_balasescu@yahoo.com](mailto:razvan_balasescu@yahoo.com)

or about reversibility or irreversibility of the time flow, but also about the views on the sense of time: the thermodynamic sense (e.g. increasing entropy), the cosmological sense (expanding time or time-space) and the psychological sense (e.g. we can remember just the past). Time is also an issue of great economic and social importance and time units were made by agreement to quantify the duration of events and the intervals between them, regularity or the frequency of events serving as standard units for the time (e.g. the movement of the sun in the sky, major astronomical events of the year, moon phases, etc.).

In the work of Tănăsescu, Brătian and Oprean (2011), we acknowledge the fact that “the process represents the form through which a phenomenon appears, more exactly the evolution that is noticed for a phenomenon, the latter being the knowable version of a *noumenon*”. Also, according to Dinga (2009) the economic process is an artifact, being a substitute for the economic act and measured by the economic phenomenon, representing an entity whose advent is determined by an ad-hoc deliberate decision-making.

Regarding the economic time, in Dinga and al (2011), the economic time does not overlap over physical time (the clock time), each economic process having its own time, with its own rhythm and cycle. Disclaiming of the Kantian vision of an absolute, conventional time and the coupling with the specificity of the process measured in the economy has led to the most frequent use of the concept of economic time. As Dinga and al (2011) observed, economic tact differences give the greatest distance between economic systems, economic disaster measurement being made when physical (mechanical) tact is less than economic tact. Also, Dinga and al (2011) state that economic time also involves a preferential direction for economic time given by the initial conditions (an arrow of time) and that the initial synchronization of physical tact with economic tact implies a convenient translation of the origin of the axes.

The concept of sustainable development, which emerged as a response to the global crisis of the early 1930s, is often seen as the new and even the only path of humanity, proposing a reconciliation between economic, social and ecological progress, proposing values centered on humankind and on its present and future needs, but also on nature, by preserving and regenerating the ecological patrimony of our planet. From this perspective, economic time can represent something else than economic time as it is classically defined.

From the perspective of sustainable development, the notion of time illustrates a problem to be resolved, a lesson to be learned or a necessary mentality changing as a way from a “shallow” anthropocentric behavior to a “deep” approach of human existence. In this framework, it is taking into account the connection between nature, society and economy based on the knowledge management principles of economic freedom, social responsibility and consolidation of education cultural values system that defines human being as a creation that has logical mind, social intelligence and Christian conscience (in the sense of fairness, fidelity, morality and respect for the/between people and from people to environment).

## **Description of the Problem**

Economic science is often accused by the lack of its own theory of scientific knowledge, incorporating an impermissibly large amount of data, information, methods and paradigms from physics, chemistry, biology, sociology, theology, philosophy, informatics, medicine, etc. According to Hawking (2001), a theory “is only a model of the universe, or a limited part of it, and a set of rules linking the model scale to the observations we make. It exists only in our minds and has no other reality (whatever it may be). One theory is good if it meets two requirements: it must accurately describe a wide class of observations based on a model that contains only a few arbitrary elements, and must make predictions on the results of future observations.” Also he observes that any theory is always based only on hypothesis, being temporary, and can be easily rejected or not proved, especially if at the base of theory are experiments, which can contradict the theory at some point in time. According to Popper (2001), a good theory is characterized by the fact that it allows by observation the possibility of falsification or the existence of some contradictions of the predictions of the theory. Still, regarding the economic field and its scientific theories, this influx of tangential knowledge can be partly explained by the need to find a way of its own, according to the present and future needs of economic science.

The economic time is quite less treated by the economic literature. Thus, according to Tănăsescu, Brătian and Oprean (2011), "In economy the concept of time for the economic process is only a unit for measuring it from the outside and the studied economic phenomena are only in the form of some dynamic trajectories with attributes such as: determinism, regularity, reversibility". As noted by these authors, understanding the economic process and especially of economic time is more than relevant in the world of finance, in which financial asset assessment models conducted over continuous time have provided a range of opportunities for speculation and financial innovation that led to speculative balloons and eventually to the Wall Street financial collapse and to the world-wide recession. Also, they noted the fact that a possible cause of this situation (countless financial crises!) is precisely the lack of tools to provide predictability in economic science. More specifically, the fact that economic time is not treated systematically (including through philosophy) and that it is certainly not used the right clock to measure the economic processes.

Measuring the economic time of an economic process of an entity allows a more accurate localization of shortcomings in optimizing the time of an economic process, but the assessment of the economic time allows also a qualitative description of economic time and a better understanding of the production, distribution, and sales processes. Thus, we can say that the extremely vague literature on economic time has no record of the connection of economic time with sustainable development paradigm.

## **Methodology and Data Sources**

The article is intended to be a critical, logical and theoretical analysis that aims to identify the less well observed aspects of economic time, focusing our attention on the distinctive features of sustainable development economic time. In the paradigm of sustainable development, economic time express the need to incorporate time elements that will allow the transition from an economy based on financial optimality to an economy based on sustainability and resource maintenance while simultaneously satisfying the trinomial of social, environmental and economic efficiency. The paper aims at identifying typologies and specific features of economic time within the sustainable development paradigm, so that by understanding our approach, in the perspective of implementation, the economic time will gradually incorporate the perspective of reformulated time according to sustainable development paradigm.

## **Results Obtained**

### **Some Economic Time Approaches**

In the economic framework, time means also knowledge of existence starting from its Cartesian essence "cogito ergo sum" ("I think, therefore I am", Descartes, 1911) and which has at least two possible approaches or perspectives:

1. The perspective of time of action, the actual time for conducting of an economic process
2. The perspective of time of meditation, the time of reanalyzing and rethink the production framework, including the management performance

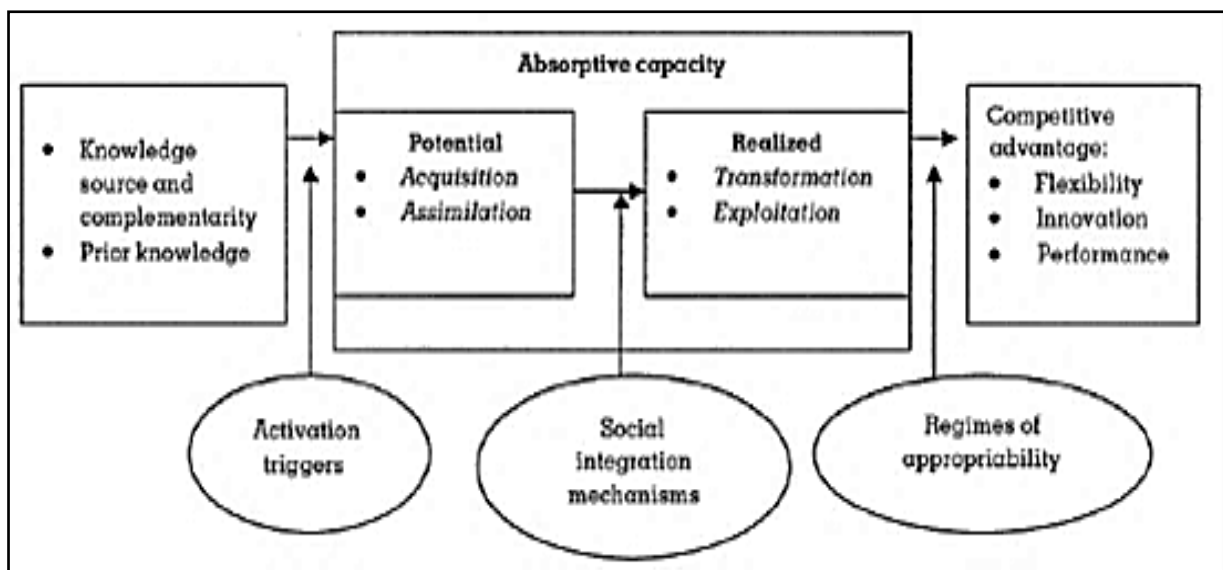
The first perspective of economic time illustrate the relation between dates, information and knowledge in the framework of comparative and competitive management of so called STI (Science –Technologic – Innovation) and DUI (Doing, Learning, Interacting ) methods integrated in the so called Kaizen (a Japanese concept of sustainable way of continuous improvement of all aspects of working and living meaning both thinking and experimenting) and SECI (Socialization, Externalization, Combination, Internalization) knowledge action models (Nonaka and Takeuchi, 1995; Jensen, Johnson and others, 2004; Cheng, 2015). Understanding these forms of knowledge allows us to have a discussion about the two modes of innovation, STI and DUI and their implications on economic time.

STI innovation is based on scientific knowledge, the 'know-why,' and the formalized 'know-what.' STI knowledge is explicit knowledge, meaning it is able to be written down and understood by others who read it. Organizations tend to like STI innovation because it is seen as easier to measure and to understand – there is a formal process. The consequence of STI is the

development of knowledge, design, collection, analysis, control and development the production, financial and market image taking into account the continuous optimization of economic production factors as well as the continuous improvement of activities in the context of a relative prices structural matrix. Regarding the economic time of STI knowledge, we can note that it can be conspicuously long and it embraces all stages of formal knowledge, fragmenting economic processes into more limited sequences that can lead to understanding of the shortcomings and in final to the shortening of the economic time segments for all or at least for some of the stages from design to selling.

DUI innovation is based on experiential knowledge, the 'know-how' and 'know-who,' often called learn-by-doing. DUI knowledge is implicit/tacit knowledge, meaning it is understood without being stated and in fact might not truly make sense if stated – like riding a bike. The benefit of DUI innovation is a wealth of information based on interaction inside and outside the organization, focused on what we can do with this information, the practical application, instead of why we are finding this information. DUI brings with it a powerful feedback loop that helps organizations build the right thing, often quicker and makes the organizations to be open to solutions that it may not currently be seen – this links to organizational learning in order to develop the so called absorptive capacity (AC) – more exactly the firm's ability to identify, assimilate the acquired information from outside the firm, to transform and to exploit properly the new knowledge from the environment (Zahra and George, 2002)(see figure 1). The economic time in DUI knowledge is a lot less than in STI knowledge, but presents the impediment that is an extremely variable and fluctuating element, sometimes with large amplitudes, being practically a complementary time to that determined by classical knowledge in the economic process.

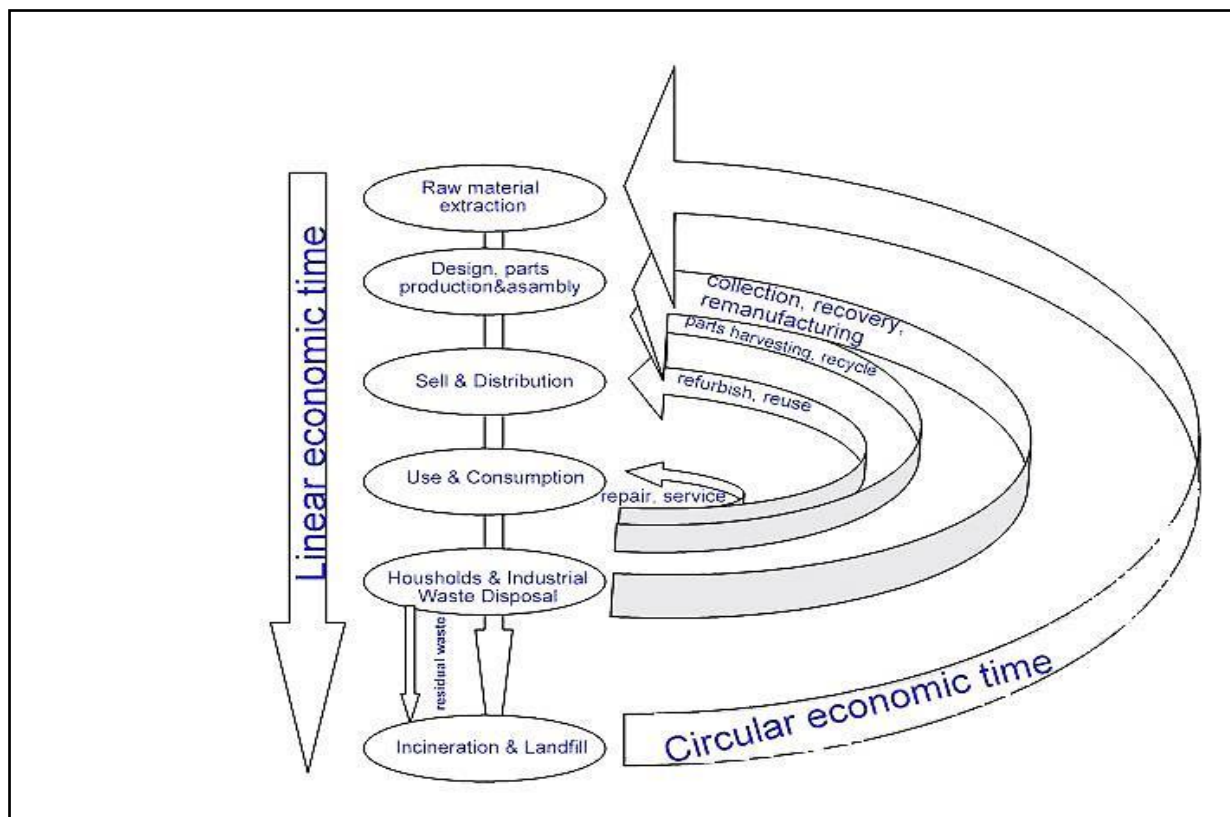
**Figure 1 – Absorptive Capacity Model**



Source: (Zahra and George, 2002), *AC: A Review and Reconceptualization, and Extension*. *Academy of Management Review*, 27(2), 185-203.

If we take into account the sustainable development paradigm, the economic time involved both in the STI knowledge process and in the DUI knowledge process acquires some other significance, becoming apparently longer (see figure 2). Also, it presupposes a deep restructuring of the components and the functioning of the economic process, which may in time diminish the volume of inputs in the system. Thus, these methods of STI and DUI can be integrated in so called sustainable development generational management models that illustrate both linear and non linear features. Both linear and nonlinear models could help the deepening of understanding of “weak” and “strong” features of sustainable development and implicitly of economic time in sustainable development / circular economy paradigm.

**Figure 2 – The diagram of linear, circular economy and economic time in these paradigms**



Source: processing and reconfiguration by WRAP and Ellen MacArthur Foundation reports and diagrams

The second approach of economic time can be a philosophic, or a meditation time about the relationship between economic freedom and social responsibility, taking into account a necessary changing of the human mind and conscience – metanoia – through education, culture, patriotism and spiritual life. These aspects are a step forward from a “shallow” to a “deeper” mature approach of sustainable development (Naess, A.1995). In this sense, the idea of “meditation” time is also a form of reformulation of fundamental issues related to success, use and results. In this approach, it matters more the path followed – one intended to ensure prosperity for future generations – and less the net benefit or the profit of a business. In this sense, for the entrepreneurs it matters more the interrelationships in the business environment and the ensuring of the social and environmental welfare of the business. Therefore, the time of "meditation" is the time of restructuring the way of life and functioning (of a person, but also of a business), of finding alternative solutions for simplification and "relaxation" of everyday life by embedding in the productive circuit as resources the former products who reached the stage of waste. This type of transition requires a change of paradigm from the competitive economy to the conjugate, collaborative economy, unique to each of its segments but functioning as a whole.

Another approach to economic time can be seen from the perspective of barriers to opening a business or its (production and distribution technology line or products) upgrading. Thus, a considerable impact on a business can have the theoretical, legislative, institutional, political and operational frameworks, by prolonging the economic time. This reality becomes even more obvious when implementing a circular business in line with the sustainable development paradigm. In this situation the economic time will encompass the inertia and the system change reluctance (e.g. the dependence on the old path).

### **Some Features of Economic Time and of Economic Time in Sustainable Development Paradigm**

The economic time of an economic process is also linked to the economic times of another economic process, the easy connection of these times, their harmony or disharmony, creating a

harmony or general disharmony between firms, between firms and state, in some branches of a national economy or even in the overall economy. Practically, economic time proposes the optimization of physical time, having the property of increasing the degree of economic involvement (implicitly of the time) of other economic agents. So, an economic time shows *flexibility, heterogeneity, optimization, gravity and networking properties*. Thus, the economic time and space presents a number of attributes specific to the network theories. According to Barabási (2002), the networks are at the heart of Complex Systems (cellular, neural, social, communication-internet, trade networks and any other interconnectivity systems) and implies the existing of nodes which are grouped in small clusters and each node is connected with other nodes (forming routers or hubs) and less with the outside world, the interconnectivity being the strong point (bringing competition and strength) but also the weak point (e.g. one sick node infecting others) of networks. Thus, we can see that the economic time has some properties of free-scale networks analyzed by Barabási (2002) but the concept of networks apply even better to circular economy and sustainable development. These concepts involve an active and perpetual integration of phases of the economic process extending the production cycle beyond the product waste phase. Therefore, the economic time in the paradigm of sustainable development and circular economy is longer than in classical economic time. It involves a better distribution / reassembly of the intermediate phase times. It includes a permanent time of reanalysis, an innovation that is absolutely necessary in finding the solutions that make better use of waste and assuming even from the very beginning the design for a modular system that allows, by recovery, only the replacement of what is spoiled from a product or process.

Like economic space, economic time can also present discontinuities, overlapping over the concrete time, but also presenting certain syncope necessary for the normal functioning of the economic process, such as the absence of music during the singing of a song. The lack of continuity in the economic process and implicitly in economic times should not be perceived as a tragedy especially in the case of seasonal business or in creative/conception business, (e.g. research, innovation, IT, etc.), but there should constantly be a concern to shorten dead or inefficient times and better linking of economic times. According to this perception, economic time is a time of change requiring an extension in time as much as necessary in order to achieve the desired result (effectiveness) and less mechanical, recorded efficiency (e.g. number of hours per product etc.). In sustainable development paradigm the economic time is more expanded than the usual economic time, having an extremely high frequency of discontinuities necessary for the more careful binding of the productive process (e.g. the internal productive process being inseparable from the external one - the connection with other companies downstream or upstream to the business).

As economic space, the economic time shows greater flexibility than physical time, its denseness varying depending on the economic process to which it is destined. He presents the flexibility and heterogeneity of the economic process to which he is assigned. These attributes are even more pronounced in economic time from the perspective of sustainable development and circular economy. The increased desirability and the extended flexibility of economic time are due precisely to the particularity of business functioning according to principles other than those of the classical economy.

Like the economic process and the economic space, economic time shows nonlinearity, relativity, but also the human subject endogeneity in the economic process. Thus, we are in Tănăsescu, Brătian and Oprean (2011) assertion that argues the existence of an economic time that is not perceived phenomenological and is not linearly correlated with the known economic processes, as well as the fact that efficient determinism and causality are not instrumental elements suitable for understanding the economic processes/activity but only the final causality, the teleological one (the purpose of the economic subject). In this sense, we postulate that the economic process in sustainable development is very different from the economic process in the classical sense, not by changing the purpose-type causality, but by correcting the human behavior by law, education and mentality so that from the positive consequences of an economic activity to benefit not only the author(s). Thus, in the paradigm of sustainable development, economic time is in turn redefined not as a time of speculation, of obtaining profits at any cost (as now!), but as a time of correct and concrete connection to the needs of others, not only under the constraint of the moral principles and laws but especially under the constraint of a new, better, more efficient way of doing business.

Conservation of natural and industrial resources may no longer represent an option in the near future. It could quickly become a real constraint imposed by realities and laws, and then the mechanism of business development at local, regional, international level will fundamentally change. Waste that has been expelled from the civilized world into third world economies or underdeveloped economies will be in the near future “redeemed” and “imported” to allow economic, social and political survival. In this paradigm, economic time is not a time of efficiency in a mechanical sense, but a time of searching and finding alternative options.

## Conclusions

The paper proposes an analysis of some fundamental concepts underlying the description of the economic process: time, time-space coordination, sustainable development and economic time. In this analysis, we will also channel to emphasize the importance of reconsidering economic time from the perspective of sustainable development paradigm. Our approach is motivated by the literature shortcomings and the need for theoretical and methodological developments, especially that there is no record of the connection of economic time with sustainable development paradigm.

In this sense, we analyzed economic time at least from two possible perspectives: the perspective of time of action, the actual time for conducting of an economic process and the perspective of time of meditation, the time of reanalyzing and rethink the production framework.

The first perspective of economic time illustrate the relation between dates, information and knowledge in the framework of comparative and competitive management of so called STI (Science –Technologic – Innovation) and DUI (Doing, Learning, Interacting ) methods. STI knowledge is explicit knowledge, meaning it is able to be written down and understood by others who read it. Organizations tend to like STI because it is seen as easier to measure and to understand – there is a formal process. The consequence of STI is the development of knowledge, design, collection, analysis, control and development the production, financial and market image taking into account the continuous optimization of economic production factors as well as the continuous improvement of activities in the context of a relative prices structural matrix. DUI is based on experiential knowledge, the ‘know-how’ and ‘know-who,’ often called learn-by-doing, being an implicit/tacit knowledge. DUI brings with it a powerful feedback loop that helps organizations build the right thing, often quicker and makes the organizations to be open to solutions that it may not currently be seen. The economic time in DUI knowledge is a lot less than in STI knowledge, but presents the impediment that is an extremely variable and fluctuating element, sometimes with large amplitudes, being practically a complementary time to that determined by classical knowledge in the economic process. If we take into account the sustainable development paradigm, the economic time involved both in the STI knowledge process and in the DUI knowledge process acquires some other significance, becoming apparently longer.

The second approach of economic time can be a philosophic or a meditation time about the relationship between economic freedom and social responsibility, taking into account a necessary changing of the human mind and conscience – *metanoia* – through education, culture, patriotism and spiritual life. In sustainable development paradigm this type of economic time is more pronounced containing the time of transition from the competitive economy to the collaborative economy.

When considering the features of economic time of an economic process we argue that economic time proposes the optimization of physical time, having the property of increasing the degree of economic involvement (implicitly of the time) of other economic agents. So, an economic time shows *flexibility, nonlinearity, heterogeneity, optimization, gravity and networking properties*. In sustainable development paradigm the economic time is more expanded than the usual economic time, having an extremely high frequency of discontinuities necessary for the more careful binding of the productive process. According to us, in the paradigm of sustainable development, economic time is in turn redefined not as a time of speculation, of obtaining profits at any cost (as now!), but as a time of correct and concrete connection to the needs of others, not only under the constraint of the moral principles and laws but especially under the constraint of a new, better, more efficient way of doing business.

## Future Directions to Be Approached

This analysis can be extended to other features of economic process (e.g. causality, space etc.) according to sustainable development or circular economy paradigms. When considering economic time from the sustainable development perspective, the theoretical analysis can be looked from other corners and views or even studied as a concrete, practical case study.

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