



THE IMPORTANCE OF THE TIME FACTOR IN THE ANALYSIS OF ECONOMIC PROCESSES

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Article history:	Abstract:
Received: 30 th October 2024	The article summarizes economists scientists opinions about the role of the time factor in economy/ The author cons the time factor not only as a source of economy but alsoras one of the main elements of the usefulness of capital and consumer goods.
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"The wealth of society is determined by the amount of leisure time its citizens have."
— K. Marx

INTRODUCTION. As is known, throughout the development of economic theory as a science, economists initially identified land, capital, and labor as factors of production. Later, entrepreneurship and information were added as additional factors. In the modern era, life, production processes, and product life cycles have accelerated so much that the importance of the time factor has increased significantly. Perhaps for this reason, many economists and mathematical economists are engaged in studying the role of the time category in the economy and its significance in analyzing economic processes.

RESEARCH OBJECT AND METHODS. The role of the time factor in production and service processes has been chosen as the research object.

The research results were obtained using the positive approach method, analysis method, scientific abstraction method, and conclusion-making method.

RESEARCH RESULTS AND DISCUSSION. In the natural sciences, there are two main concepts of time characteristics.

According to A. Einstein's concept, time, matter, motion, and velocity are in a universal relationship with each other; the properties of time depend on the organization of objects and the physical interactions between them [1].

V.I. Vernadsky, in his concept of the diversity of specific times, emphasized that there are different forms of time, including immaterial ones, since there are different levels and forms of matter and motion [2].

In economics, there are widespread opinions about the time factor, the economic content of the category "time". V. Klochkova and V. Chemikhina distinguish the views of foreign scientists on the study of the time factor into three directions: first, determining the duration of the economic period (economic horizon) and

analyzing its components. The second considers time as an economic resource and tries to solve the problem of its rational use. The third studies the rate of adaptation of economic parameters over time depending on changes in other parameters [3].

E.S. Lazutkin, E.E. Lazutkina believe that "time factors should be understood as a whole complex of time conditions that affect the process of reproduction." "They include such concepts as: time of year, duration of the natural process of production, their sequence in time, the composition of time within a day that affects the intensity and efficiency of the working day, and the timely performance of certain operations" [4].

N.S. Sachko refers to "the impact of labor costs on the pace and efficiency of social production" as a time factor and believes that "as a result, the economic role ('value') of the time interval is constantly increasing" [5].

Economists also consider the value of time as a measure of labor, where the workday is discussed as an object of analysis. This issue was extensively studied in Karl Marx's *Capital*, in which he viewed the workday as the period of time during which labor is expended in the production of goods. According to him, under market economy conditions, labor is considered a commodity. During the workday, wages reflect the expenditure of physical and mental labor power, which is assessed as the value of labor. Additionally, production is distributed based on necessary and surplus labor hours. The value of goods and the amount of profit are explained by the value of social labor embodied in the products produced during working hours [6].

In the labor value theory, time and labor are considered as a single, inseparable substance. Time is viewed as a general characteristic of labor, which allows it to be used as a measure of labor.



Representatives of classical, political economy indirectly recognized the importance of the time factor in the formation of commodity value, they did not pay special attention to it or consider time as an independent subject of study. As a result, the time factor is defined as a measure of the scale of a phenomenon.

Kazakh economist E.N. Mamirov proposes introducing the concept of "economic time," defining it as "the construction of calendar and astrophysical divisions within certain economic processes. It indicates the duration and sequence of economic activity" [7].

As you can see, the author assigns the role of a passive measurement tool for length to the time factor. Moreover, economic processes can only occur within the framework of astrophysical time (and not the other way around).

The author emphasizes that "since all processes occur in a certain order and depend on astronomical time, the presence of economic matter within a time interval is not only possible but necessary. The fundamental unifying principle in studying all types of matter and their movement is astronomical time." Unfortunately, the author does not provide a definition of "economic matter." However, from the context of the text, it is evident that, in his view, economic matter has a nature opposite to the laws discovered by natural sciences. After all, according to these sciences, the properties of time depend on the type of matter and its movement. One of the most important aspects of the calendar value of time is understanding the movement of all production relations. "Economic time... can be defined as a set of calendar time periods corresponding to various production relations." Ultimately, the author considers economic time to be economic periods characterized by differences in production relations.

Even a brief list of scientific approaches aimed at determining the significance of the time factor in economics demonstrates both their diversity and their relevance to the field.

Many economists highlight characteristics such as the duration of a phenomenon (workday, calendar periods, economic cycles) and its historical aspects. They view and utilize time in economics as an indicator of historical continuity, ranging from production operations to long-term economic cycles. Having different perspectives is natural, as astrophysical time is a form of matter's existence and is multifaceted.

Various philosophical and scientific works attribute different characteristics to the phenomenon of time [8]. One of these is the distinction between real time and time models. Humanity strives to understand the essence of time and fit it into certain models. For example, production planning serves as an illustration.

A plan developed to achieve a specific goal represents a time model. However, the actual time spent on production processes, considering unexpected circumstances, is an entirely different matter. Only in relatively rare cases do the time model and real time fully align.

The second characteristic of time is that real time does not exist independently; it only exists in connection with specific objects or events. This is its fundamental attribute. To effectively manage a modern organization, which is a complex, multi-component system, it is essential to recognize that each of its elements has its own time. In other words, multiple types of real time exist, each associated with different objects and events. The third characteristic of time is the change in an object's properties relative to other objects in real time. This implies that all time is inherently relative.

The fourth characteristic is that changes in an object can be used as a time standard. The nature of these changes—whether in terms of duration or periodicity—can serve as a measure (unit) of time. This characteristic regulates the measurement of real time. For example, in an industrial enterprise, the time spent from the start of production to the acceptance of a finished product can be used as a time standard.

The fifth characteristic is that real time is continuous. Discreteness allows us to formalize our plans in a strict structure and align everything around us with precisely scheduled time frames. However, at the same time, we must remember that many processes continue uninterrupted and may not conform at all to our carefully planned schedules.

In many complex management situations, managers face the dilemma of whether to act according to a plan or adapt to real conditions. Some well-known managers who have achieved success often deviate from the plan and act intuitively in alignment with the real time of ongoing processes.

The sixth characteristic of time is that the real time of simple objects is one-dimensional (monochronism), whereas the real time of complex systems is multi-dimensional (polychronism). For example, a manager must immediately abandon a monochronic mindset, as every manager inevitably deals with polychronous objects and structures.

The seventh characteristic is that real time is uneven. A simple and clear example of this is a school classroom. On the surface, it consists of "similar objects" (students of the same age) who are in the same conditions (the same teachers, the same subjects). However, they exhibit different levels of learning and academic performance.

Aligning time models with real time is always a crucial issue. Using a "good" model ensures success and



competence over time, while relying on a "bad" model leads to asynchrony and failure (fragmentation and bankruptcy). This characteristic is a fundamental point in understanding the essence of time for any entrepreneur or specialist. If a subjective time model corresponds to the real time of objective processes and events (such as labor operations and business activities), the entrepreneur can expect high profitability.

Human economic activity is aimed at adapting material and spiritual wealth to personal consumption needs, with the time factor ensuring the reproduction cycle of economic processes, their unity, uniformity, and comparability.

To determine the role of the time factor in the economy, it is not enough to view time as a single continuum or as an orderly sequence of economic processes. In economics, the objectivity of the subject of study can be assessed by its connection to the fundamental category of economic theory—"value."

From this perspective, we can conclude that representatives of the non-classical school of economic theory have approached the significance of the time factor in economics empirically. According to them, the time factor is a fundamental characteristic of capital and is considered its very essence.

For example, I. Fisher defines capital as a "discounted stream of income." His idea is that the value of capital goods today will increase over a year by the amount of the annual interest rate. To determine the present value of material goods that can be obtained in a year, a discounting operation must be performed—that is, the time factor must be taken into account [9].

In modern economics, capital is understood as any element that provides its owner with stable income over a long period. In this case, capital is viewed as an abstract productive force that includes not only fixed assets and land but also labor. The "labor" factor represents the ownership of skills and ideas. Thus, according to neoclassical economists, the time factor is considered essential only for capital goods.

However, the value of capital is reflected in its productivity and economic outcome. Therefore, to answer the question, "Why is time the essence of capital?" it is necessary to examine the nature of labor productivity. According to traditional theory, labor productivity is defined as the value of goods produced within a unit of time. This indicator is crucial for describing the efficiency of capital activity. However, it does not fully reveal the essence of the production process.

The productivity of capital increases labor efficiency and saves the producer's time, but it also requires expenditures on research and development, scientific

organization of labor and management, and other costs. In other words, a certain amount of financial investment is needed to save production time. This implies that saved time has its own value and price.

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Let's imagine the flow of time that moves from the future to the past in fractions of a millionth of a second and the manufacturing technology that attempts to "capture" it and utilize it for production. We are talking about using the smallest possible fraction of a second required to perform a specific manufacturing operation. In our view, such a conceptualization allows us to consider the time factor from two conditional perspectives: first, as a resource used in organizing production and executing manufacturing operations, and second, as a scale (interval) for measuring production efficiency. Consequently, capital productivity, as an indicator of production efficiency, reflects the volume of goods produced within a given period, while as a process, it demonstrates the extent to which the available time is utilized [10].

The productivity of capital increases labor efficiency and saves the producer's time. However, it also requires expenditures on research and development, the scientific organization of labor and management, and other related costs. In other words, saving production time requires a certain amount of financial investment. This implies that the saved time has its own value and price. It is well known that anything with value and price is regarded as an economic good. Furthermore, economic goods used in the production of goods and services are considered economic resources. Consequently, this leads to the scientifically valid conclusion that the time factor should be regarded as an economic resource.

Furthermore, if we clarify Karl Marx's theory of surplus value, we can argue that during the work process, both workers and managers expend not only their physical and mental energy but also their time. While the energy of workers and managers is replenished through wages paid for their labor, time, on the other hand, is irreversibly lost and cannot be recovered.

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regarded as economic resources. This, in turn, allows us to conclude that considering the time factor as an economic resource is scientifically valid.

At the same time, the usefulness of capital is determined not only by its productivity but also by the usefulness of the goods and services it produces. Representatives of the marginal utility theory attempted to find a unit of measurement for the utility of goods. However, they later abandoned this effort, as measuring the utility of various consumer goods in a single unit proved to be highly challenging.

Thus, consumer goods are also measured by the time factor. All consumer goods share two fundamental characteristics: they save (or increase) the consumer's energy and time. In other words, they provide the consumer with additional time. This characteristic applies to all types of consumer goods, including money. It is important to note that saved energy also grants a person additional time. As a result, both consumers and capital owners gain not only calendar time but also additional time. Therefore, the time factor can be considered one of the primary forms in which the utility of consumed goods manifests, holding corresponding value.

Thus, in our view, the time factor in the economy manifests as a resource that is materialized through human economic activity, multiplied through economic goods created by people, holds intrinsic value, serves as a source of profit for entrepreneurs, and constitutes a key characteristic of the utility of consumer goods.

CONCLUSION

1. We consider the time used in the economy as an economic resource.
2. The time spent by workers and managers during the production or service process is not lost but accumulates in favor of the entrepreneur.
3. The profit generated as a result of economic activity represents the value of the accumulated time in favor of the entrepreneur.
4. We believe that the time factor in the economy has intrinsic value and serves as a source of profit.

5. All consumer goods share two fundamental characteristics: they save (or increase) the consumer's energy and time.
6. The time factor manifests as a key characteristic of the utility of consumer goods.

It should be emphasized that we consider this phenomenon a positive experience. Through this process, humanity is effectively accumulating today's time for future use. Profit, as the monetary representation of today's time, is invested in the development and implementation of new technologies, reconstruction, and the expansion of production, ultimately leading to the creation of additional time in the future.

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