The Economy as a Complex System of Economic Actions:

In Search of a New Paradigm

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The Annotation

Based on a dialectical analysis of purposeful activity, a decentralized economy is presented as a complex nonlinear living system of economic actions. In such an economy, the general laws of the universe, which dialectics and synergetics studies, manifest themselves in a specific form. This allows us to see many well-known economic phenomena in an unusual light and to discover in them what cannot be detected by standard methods of orthodox theory. The monograph presents a system of concepts, based on which the fundamentally new interpretation of how the market economy functions and how it has evolved from its inception to the present is given. It is shown that behind the external chaos of economic life hiding surprisingly ordered, symmetrical, deep structures that provide self-regulation of a competitive market economy. Like all living systems, the economy is developing, which results in the monopolization and financialization of the economy. But over time, it loses the ability to self-regulate. Regulation becomes necessary, because of which the role of centralization of the economy increases. The search for new methods of regulating such an economy becomes inevitable.

Content

Dedicated to the heroic Ukrainian people

Foreword

Attempts to provide an unbiased scientific explanation of the processes occurring in the modern economy do not fit the neoclassical paradigm. This paradigm demonstrates an apparent inability to cope with the problems it faces. The economic mainstream was developed by different scientists over different periods of time. And although this was a necessary stage in the development of economic theory, it has long exhausted the scientific potential for its further advanses, and at present, it has brough the theory to a deadlock. One of the main reasons for the crisis of economic science is the inadequacy of its research methods. These methods need radical rethinking.

Modern science has accumulated enough knowledge to come closer to understand how the market economy functions. But this knowledge is so dispersed across disciplines and scientific fields that it is difficult to see the links between them. Many philosophical and sociological doctrines and research programs, both long-standing and relatively recently appeared, contain interesting ideas and methodological approaches that are ignored by the mainstream but have the great scientific potential to lead economic science out of the deep crisis in which it finds itself. These include the ideas of Hegel, I. Prigogine, H. Haken, T. Parsons, N. Luhmann, U. Maturana, F. Varella, H. Foerster and others. A systemic vision of reality unites all these scientists. But since these ideas are scattered in the doctrines of various thinkers who have different, sometimes mutually exclusive worldviews, and are not linked to each other, they often remain outside the attention of economists. A methodological approach based on the synthesis of these ideas makes it possible to interpret economic reality in a new way.

Moreover, in the context of a such methodological approach, many well-known economic ideas, both recognized by neoclassicists and rejected by them, also gain new meaning. There are interesting logical touchpoints between these ideas which offer new perspectives on the operation and development of the market economy. In this regard, we can mention the ideas of K. Marx, L. Walras, L. Mises, F. Hayek, J. Keynes, P. Sraffa, P. Sweezy and others. Their views inspired this study. The ideas of these scientists, removed from the contexts of those sometimes incompatible doctrines to which they belong, and placed in the correct relationships, explicitly or implicitly underlie the proposed concept. The result was not a compilation of old ideas, but an authentic concept.

At the same time, we are not referring to those provisions of these doctrines that are not used as construction material for the proposed concept. We do not believe that all the ideas of

these scientists are acceptable for economic science. We simply do not address these questions, as the purpose of the proposed study is not an interpretation or critical analysis of these theories. We mention these ideas only insofar as it is dictated by the need for an adequate understanding of our proposed concept.

As is known, in the works of the classics, special attention was paid to the theory of value, which shows the exceptional importance of this problem. Many questions remain unanswered to this day. But the problem of value has turned out to be so complex that modern economic theory practically ignores it, shifting the whole focus to the problem of price.[1] Initially, my scientific interests were concentrated on the problem of value. It has always seemed to me the central problem of economic theory, which could provide the key to understanding other important problems. Several of my articles and special monograph chapters are devoted to this problem, in which value is presented as a unity of utility and costs.[2] The study of the problem of value gradually led me to form a unified vision of economic processes, which is radically different from neoclassical dogmas.

As a result of the dialectical analysis of economic categories, the market economy is presented as a complex, nonlinear, living, organizationally closed and causally open system of economic actions. Complex nonlinear cognitive systems have unique properties, in the study of which synergetics, constructivism, second-order cybernetics, and network theory have achieved great success. This circumstance provides an opportunity to refer to the achievements of these scientific disciplines in the format of an interdisciplinary study of economic processes. As a result of such an analysis of a decentralized economic system, a fundamentally new interpretation of economic categories and the interrelations between them, a new understanding of economic equilibrium and the mechanism of self-regulation of a market economy have been obtained.

In a market economy, subjects produce products for each other and exchange them. The satisfaction of one's needs is mediated by the satisfaction of the needs of others. As a result, the actors are bound to each other by their actions and form a single system in which everything that is produced is consumed and everything that is consumed is produced. In such circumstances, the results of economic actions become the prerequisites for actions themselves. Each economic action gives rise to other economic actions, making the economic system an organizationally closed, self-reproducing system. The economic system is presented as an autopoietic system that generates the elements of which it consists.

[1] "…the problem of value is not held in much esteem in contemporary economic thought. … most economists today do not even see the need for a "theory" of value, as distinct from a theory of price, and would in fact be hard pressed to explain the difference between the two. … the neglect of value does not remove the issue from economics but only leads to its covert appearance in harmful form; … the questions raised by value are not antiquarian but perennial (and, I should add, not elementary but elemental); and that varying approaches to value, far from being mere pedagogical devices for periodizing the history of economic thought— classical political economy with its "labor theory" of value, postclassical with its "utility theory"—powerfully influence the constitution of economic thought itself by identifying different elements within the social process as strategic for our understanding of it." (Heilbroner, 1988, 104-105.)

[2] See Leiashvily P. "Towards the teleological understanding of economic value". // *International Journal of Social Economics*‖. Volume 23, Number 9, 1996. (p. 4 - 14); Leiashvily P. 2012. *Economic Activity: Teleological Analysis*. New York. Nova Science Publishers Inc.; Leiashvily, P. 2017. "The Relativity Theory of General Economic Equilibrium" // *American Journal of Economics*, 7(5): 216-229; Leiashvily P. "Macroeconomic Order from Microeconomic Chaos". *American Research Journal of Humanities and Social Sciences*, Vol 7, no. 1, 2021, pp. 1-15.

The economy is an organizationally or operationally closed system. This implies that the functions performed by the various actions are interrelated and form a closed system in which the performance of each function is, in one way or another, conditioned by performing all other functions. More specifically, the circular organization of functions performed by various economic actions gives rise to such a sequence of actions, which determines the reproduction of the very circular organization of functions, i.e., the operational closure. This operational closure of the system cannot be unlocked anywhere without destroying the system itself.

As a result of this approach, it becomes clear that the self-organization of a market economy is carried out with the help of recursive processes (commodities are produced by commodities, prices are formed based on prices, actions give rise to actions, satisfaction of needs gives rise to new needs, etc.). Recursive processes in the economic system, as well as in other complex nonlinear systems, give rise to "eigenvalues", or, in the language of mathematicians, "fixed points". Equilibrium prices of goods are such "fixed points" to which, because of recursive processes, actual market prices of goods tend, and thus ensure the system itself strives for general economic equilibrium.

Since the market economy is both an organizationally closed and a causally open system, it simultaneously strives for equilibrium within the system (between intra-system processes) and disequilibrium with the external environment. Equilibrium and stability within the system are necessary to maintain the integrity of the system, and disequilibrium and instability in relation to the external environment are a necessary conditions for the development of the system. Therefore, the economic system has the ability of homeostasis and, at the same time, can develop, change its state and structure, respond to external environmental influences and adapt to it.

In the evolution process of a market economy, the competition gives rise to monopolies. Over time, the economic power of private monopolies increases, making it necessary to increase the government's regulatory role. Market self-regulation is increasingly being replaced by government regulation. The history of the market economy shows that the share of the competitive sector in it is decreasing, while the share of the regulated sector is increasing. In the monopolized sector, as a private regulated segment of the economy, the distribution of society's income is carried out in favor of a group of private monopolists. And in the public sector, there is a process of reverse redistribution of income for the benefit of society. A monopolized sector increases economic inequality in society. But as long as the government is under the influence of large monopolies, it cannot neutralize the monopolistic distribution of national income. The consequence of this is a tendency to reduce the purchasing power of society relative to its production capabilities and a lag of demand behind supply. Demand has to be artificially supported by economic policies that create credit expansion. The economy faces systemic problems and, over time, replacing market self-regulation with government regulation based on economic models and digital technologies is inevitable.

The neoclassical paradigm is currently discredited, while the new one does not yet exist. A kind of vacuum of fundamental ideas, shared by the vast majority of economists, has emerged in economics, based on which the normal development of this science could continue. This creates huge problems both in economics and in economic education and

policy. But simultaneously, the created situation frees scientific thinking from neoclassical dogmas, and provides motivation and an intellectual atmosphere for enhancing scientific creativity and searching for non-standard approaches to solving scientific problems.

If we don't understand how the competitive economy works, we can't understand how the modern monopolized economy works. We cannot understand how the economy should be regulated if we do not understand the self-regulation of the decentralized economy. If we don't understand the functioning of the subsistence economy at the subjective level, we cannot understand the market economy. We cannot cognize what value and market prices are if we first do not cognize subjective values and valuations, etc. This study presents my vision of these problems.

In conclusion, the proposed study focuses not so much on criticism of the existing paradigm but on searching for alternative approaches to interpreting economic reality.

"We cannot solve our problems with the same thinking we used when we created them."

A. Einstein

"The difficulty lies, not in the new ideas, but in escaping from the old ones…"

J. M. Keynes

Introduction

1. The search for truth at the intersection of different sciences is particularly effective in the current fragmentation of scientific knowledge. Interdisciplinary research is carried out in orthodox economics. However, the achievements of related disciplines attract the attention of mainstream representatives only when they do not contradict neoclassical dogmas. The impression remains that they conduct such research not so much to cognize economic reality as to "scientifically" justify their dogmas. But the unwillingness of the orthodoxies to critically rethink obviously outdated ideas leads to self-isolation from modern science. "But no branch of human inquiry has cut itself off from the whole – and from the other social sciences – more than economics. … Today's professional economists, by contrast, have studied almost nothing but economics. They don't even read the classics of their own discipline. … . Philosophy, which could teach them about the limits of the economical method, is a closed book. Mathematics, demanding and seductive, has monopolized their mental horizons. The economists are the *idiots savants* of our time." (Skidelsky, 2016.) Such an arrogant and disrespectful attitude towards other sciences has led the neoclassical theory to a dead end for many decades of its existence. Neoclassicists are not ready to gain unexpected new knowledge or revise the basic ideas of their theory. But without taking into account the latest achievements of modern science, economic theory cannot overcome the crisis in which it found itself due to the "reinforced concrete dogmatism" (Popper) of the neoclassicists.

2. Due to inadequate methodology, the mainstream gives a false explanation of economic reality and contains many logical inconsistencies. The neoclassical theory fails to consider that the market economy is a complex dynamic system, for the study of which empiricism, formal logic and linear modeling are insufficient as a methodological basis of research. Today, these methods have turned into fetters that prevent the further development of economic theory. Using empirical methods and formal logic is a necessary stage in the development of every sciences. But at a particular stage in the development of science, these methods exhaust their possibilities of cognition, and it becomes necessary to use new methods for synthesizing the accumulated scientific material into a new paradigm. In this context, the emergence of synergetics as a new direction of interdisciplinary studies that, like dialectics, has gained importance in general scientific method of research is significant.

3. **Synergetics**. As an independent discipline, economics was formed at the end of the 18th century, i.e. in the Age of Enlightenment, when physics and mathematics were regarded as the ideal of science. The successes of classical physics led to the dominance of the Newtonian paradigm and the mechanistic worldview in science. The laws of nature and causality that exist in the Universe were thought to determine the possibility of absolute prediction of all phenomena. It was thought that there is no randomness in nature, that there is a linear relationship between cause and effect, that the Universe is in an equilibrium state, stable and predictable, and uncertainty was considered a consequence of simple ignorance of the laws of nature. Indeed, the classical political economy was strongly influenced by the dominant ideas of its era. But even the further development of economic science could not eliminate the deterministic understanding of economic reality. Synergetics, which studies the laws of functioning and development of complex systems, provides new opportunities for scientific cognition of economic reality.

"For the past 150 years, economic theory has viewed agents in the economy (firms, consumers, investors) as perfectly rational decision makers facing well- defined problems and arriving at optimal behavior consistent with — in equilibrium with — the outcome caused by this behaviour. … Complexity economics sees the economy … as not necessarily in equilibrium, … not as a perfectly humming machine but as an ever- changing ecology of beliefs, organizing principles and behaviours. The approach, which has now spread throughout the economics profession, got its start largely at the *Santa Fe Institute* (SFI) in the late 1980s. But the basic ideas of complexity economics have an even longer history in economics. Even before Adam Smith, economists noted that aggregate outcomes in the economy, such as patterns of trade, market prices and quantities of goods produced and consumed, form from individual behaviour, and individual behaviour, in turn, reacts to these aggregate outcomes. There is a recursive loop. It is this recursive loop that makes the economy a complex system. … … Whichever the case, complexity asks how individual elements react to the current pattern they mutually create, and what patterns, in turn, result." (Brian, 2021, 136.)

4. Synergetics explores how, in complex dynamic systems, random and chaotic movements of many of its individual elements can be transformed into an order in the entire system and determine the trajectory of its development, that is, how do processes occurring at the micro-level determine macro processes and vice versa? Precisely this is still an unresolved problem in the economics. This problem remains one of the main problems of economics that still needs to be satisfactorily resolved. How is economic order born out of the chaos of independent actions of agents? How does Adam Smith's "invisible hand" work? This issue is the focus of this study. The purpose of this work is to propose a solution to this problem that would more adequately explain economic realities and could become the basis for the development of more effective applied models and economic policy.

5. The pioneer in developing nonlinear economic theory is the *Santa Fe Institute*. The works of this institute cause great interest in scientists. At the same time, their concept takes as a basis the neoclassical economic paradigm, which economists created based on a linear worldview. "Because its assumptions are a widening of the neoclassical ones, complexity economics is neither a special case of equilibrium economics nor an addition to it. On the contrary, it is economics done in a more general way. This broadening of principles is not due

to a shift in ideology. It is due, I believe, to new tools becoming available to economics: methods to think about decision making under fundamental uncertainty and to deal with nonlinear dynamics and nonlinear stochastic processes. Above all, it is due to computation, which makes it possible to model arbitrarily more complicated and more realistic behaviour." (Brian, 2021, 143.)[3]

The research of the *Santa Fe Institute* enriches neoclassical economics with insights from complex systems theory. However, these studies still take neoclassical theory as a basis, which, as such, is linear, and expands its premises and principles (which became possible since "new tools became available in economic theory"). Therefore, the neoclassical theory itself is presented as a particular case of the new theory. In other words, in the paradigm of the neoclassical theory taken as a basis, nonlinearity is introduced from the outside. Our concept proposes not an extension of the existing theory's prerequisites and principles, but a fundamentally new paradigm, based on a dialectical rethinking of the basic economic categories and the links between them.

6. From the very beginning, the neoclassical theory was created based on linear thinking and formal logic. In contrast, dialectical logic presupposes nonlinear thinking. The dialectical rethinking of fundamental economic categories already initially assumes the nonlinearity and complexity of the new paradigm in accordance with which the economy is presented as a complex nonlinear system of social (economic) actions organized according to a network pattern. Despite the differences between the two concepts mentioned above, the similarity of many provisions and conclusions regarding the functioning of the economy is due to their understanding of the economy as a nonlinear system. This concerns the processes of evolution of the economic system, due to introducing historicity into the analysis;[4] the role of positive and negative feedbacks in explaining the mechanisms of self-regulation; the cyclical nature of the functioning of the economy as a complex system; the processes of interaction of the economic system with the external environment, etc.

7. At any given moment, the actual state of the economic system is determined by the interaction of two oppositely directed processes - 1) its striving for a state of absolute equilibrium, i.e., to its absolute integrity, and 2) destabilizing influence of the external environment, aimed at destroying the integrity of the system and its removal from the equilibrium state. Accordingly, complexity economics implies a constant striving for an equilibrium that is never reached. It is always in the process of finding an equilibrium, self-completing the missing parts to maintain the integrity and synchronization of intra-system

[3] "Complexity economics is not a special case of neoclassical economics. On the contrary, equilibrium economics is a special case of nonequilibrium and hence complexity economics. Complexity economics, we can say, is economics done in a more general way." (Brian, 2015, 25.)

[4] "One of the main strengths of political economy is its sense of history, of historical time—time that makes a real, irreversible difference, and that continually creates new structures. By contrast neoclassical economics handles time poorly …. At equilibrium an outcome simply persists and so time largely disappears; or in dynamic models it becomes a parameter that can be slid back and forth reversibly to denote the current outcome …. This has made many economic thinkers uncomfortable … . In 1973 Joan Robinson said famously, "Once we admit that an economy exists in time, that history goes one way, from the irrevocable past into the unknown future, the conception of equilibrium . . . becomes untenable. The whole of traditional economics needs to be thought out afresh. Certainly, in rethinking this issue of time, complexity economics accords with political economy. ... The economy at all levels and at all times is path dependent. History again becomes important. And time reappears." (Brian, 2015, 23.)

processes that the external environment seeks to mismatch. The economy is always in the process of self-reproduction, self-development and "creative destruction" (Schumpeter). "It is a different way of thinking about the economy. It sees the economy not as a system in equilibrium but as one in motion, perpetually "computing" itself—perpetually constructing itself anew." (Brian, 2015, 23.)

8. In the research of the *Santa Fe Institute*, much attention is paid to the most important processes that determine the nonlinearity of the economic system and are conditioned by the openness of this system and its interaction with the external environment. In this study, openness and disequilibrium in relationship with the external environment, are naturally supposed. Still, attention is focused mainly on the studying the economic mechanism of self-regulation, which ensures not the system's *equilibrium* itself, but only the *striving* for it. Just this striving for equilibrium ensures the economic system's ability to homeostasis. It is therefore important to know not only the properties of the equilibrium state of the economic system, but also the reasons for its aspiration to it. Without this, we cannot understand the functioning of either the competitive market economy or the modern monopolized economy; we cannot answer several questions such as: Why did a competitive economy transform into a monopolized economy? Why has the financial sector gained outsized importance and size? Why do economic crises occur? Why is there increasing economic inequality within and between countries? Why have decentralized economies historically tended to become more centralized? Why is market self-regulation increasingly being supplanted by regulation? How should economic policy respond to these processes?

9. In the proposed concept, the economy of pure competition is presented as a system of economic actions with a network organization in which every action is connected with other actions. Due to this, various positive and negative feedbacks are formed in the network of economic actions. "Positive feedbacks in fact are very much a defining property of complex systems—or I should say more accurately, the presence of positive and negative feedbacks acting together is. If a system contains only negative feedbacks (in economics, diminishing returns) it quickly converges to equilibrium and shows "dead" behavior. If it contains only positive feedbacks, it runs away and shows explosive behavior. With a mixture of both it shows "interesting" or "complex" behavior. With positive feedback interactions add to each other and cause structure, in time to be offset by negative forces and dissipate. Structures then come and go, some stay to be further built on and some lead to further structures. The system is "alive"." (Brian, 2015, 17.)

Feedbacks are a necessary condition for self-regulation in nonlinear dynamic systems. Such systems are subject to cyclical processes of self-excitation and attenuation, which, in the economic system, take the form of economic cycles. These and other properties of living dynamic systems have been studied in synergetics, sociocybernetics, complexity economics, constructivism, and the neural networks theory. However, as a methodological basis for economic research, all these theories can become relevant only after the economic system itself is presented as a complex nonlinear system of economic actions. And this is possible only based on dialectical analysis. This is precisely what we tried to achieve in this study.

10. **Dialectic.** As it exists today, neoclassical theory found its contours in the intellectual environment of empiricism, positivism, and pragmatism. Naturally, the methods of scientific research used by the economists who laid the foundations of the modern

mainstream were mainly conditioned by the corresponding philosophical ideas, in sharp contrast to the ideas of dialectics. Dialectical research methods were categorically unacceptable to all those economists on whose ideas the neoclassical paradigm was built. Moreover, in general, in modern Western science, of which the economic mainstream is also a part, a negative attitude towards dialectics dominates. It is not superfluous to mention, also, that the views of the post-positivist Karl Popper played a significant role in shaping such an attitude of modern economists towards the dialectic. One of the influential philosophers of science of the 20th century, who had a major influence on the worldview of the Western intellectuals and enjoyed great prestige among economists, he spoke sharply negatively about dialectics, and the philosophy of Hegel and Marx in general.[5] K. Popper was not the only influential scientist with such a disrespectful and even hostile attitude towards dialectics. Such a unanimous rejection of dialectics in the scientific community of Western economists was reflected in the development of economic science, which for many years has been in a state that cannot be called otherwise than a "crisis of science".

11. To paraphrase M. Blaug, we can say that "dialectic is too serious a thing to be left only to philosophers". At the same time, it is worth noting that the interest of Western economists in the doctrine of K. Marx and, consequently, in dialectics, *has begun* to rise. But on the whole, dialectical research methods have not yet received the attention they deserve. One goal of the proposed study is another attempt to once again draw economists' attention to the scientific potential of dialectical research methods.

The dominant methods of cognition in the mainstream, based on formal logic and empiricism, are diametrically different from those based on dialectical logic. These fundamental differences manifest in all key aspects of the methodology. However, their understanding of the "law of contradiction" is the central point of disagreement. Formal logic states: "everything is identical to itself, or nothing contradicts itself". Dialectical logic states: "nothing is equal to itself, or everything contradicts itself". Without contradiction, this unity of opposite definitions in the essence of things, has no emergence, change, movement, life, development, etc. "Contradiction is what moves the world in general and it is ridiculous to say that contradiction cannot be thought." (Hegel, 2010, 285.)

12. Contradiction is the source of activity of everything that contains irreconcilable, mutually exclusive opposites. Each of them is the supplement of the opposite side to complete specific integrity and create that unity, outside of which none of them can exist. At the same time, they are direct opposition to one another, and, in this sense, irreconcilable, mutually exclusive opposites exist. Each of the sides is not simply something "other" in relation to its opposite, but is "its other" and, therefore, is "its other" of "its other". For

[5] In the acclaimed treatise *The Open Society and Its Enemies*, long considered a reference book for Western intellectuals, he writes: "But as far as Hegel is concerned, I do not even think that he was talented. …. his style is 'unquestionably scandalous'. And as far as the content of his writing is concerned, he is supreme only in his outstanding lack of originality. There is nothing in Hegel's writing that has not been said better before him." (Popper, 2013, 246) And further, referring to Schopenhauer and agreeing with him, he writes: "Schopenhauer,who had the pleasure of knowing Hegel personally and who suggested 13 the use of Shakespeare's words, 'such stuff as madmen tongue and brain not', as the motto of Hegel's philosophy, drew the following excellent picture of the master: 'Hegel, …. was a flat-headed, insipid, nauseating, illiterate charlatan, who reached the pinnacle of audacity in scribbling together and dishing up the craziest mystifying nonsense. This nonsense has been noisily proclaimed as immortal wisdom by mercenary followers and readily accepted as such by all fools,…" (Ibid, p. 247)

example, in economic reality, production and consumption, product and resource, utility and cost, etc., cannot exist without each other. But together, they form, accordingly, an economic action, an economic good, an economic value, as independent wholes.[6]

In various spheres of reality, the emergence and resolution of contradictions manifest themselves in various specific forms. Since all economic subjects, their actions, their relations to objects and the objects themselves, are a unity of irreconcilable opposites, they all contain a contradiction in themselves. These are existential contradictions inherent in the very essence of these phenomena, which determine their internal instability, variability, and finiteness. Polar opposite sides do not withstand the "tension" of internal contradiction within the integrity of the same something. They strive to "break out" of it. But since they cannot exist without their opposite, they strive to connect with the «their other» but, existing in another something, in another integrity.Those leads to the interaction of things, in the process of which the interacting wholes are destroyed, and others – created.[7] The resolution of the contradiction causes "creative destruction", the disappearance of some, and the emergence of other structures. And this is precisely a movement in one form or another. But as a result of this movement, reality changes, in which a new configuration of interacting forces (interests, needs, tendencies, properties) emerges, and polarization of the interacting parties occurs again. Accordingly, new contradictions arise, which are also resolved, and so on. This process cannot stop and continues infinitely.

13. In the economy, the emergence and resolution of contradictions gives rise to economic actions, the totality of which is precisely an economic activity. Economic actions are expedient actions and thus previously require decision, the essence of which always comes to a choice between means and results, resources and products. And the choice as such always contains the opposition of interests. The clash of opposing interests gives rise to a contradiction, the resolution of which is the adoption of a decision, followed by action. But the results of actions give rise to new opposing interests, new contradictions, and so on.

Consider an elementary act of a market transaction between a seller and a buyer. Each side has what the other side needs. One side has goods, and the other side has money. Potentially, they can get what they need from each other. This is *an agreement, unity of interests*. But to do this, they must give them what they have and also need (for consumption

[6] "Difference *in itselfis essential* difference, … Because each is for itself insofar as *it is not the other*, each *shines* in the other and is only insofar as the other is. The difference of the essence is thus the *opposition* according to which what is differentiated does not have an *other in general* but instead has *its* other opposite it. That is to say, each has its own determination only in its relation to the other, … and the same holds for the other. Each is thus the other's *own* other." (Hegel, 2010, 182-183) "With the positive and the negative, one thinks that one has an absolute difference. Both, however, are in themselves the same and one could, for that reason, name the positive also the negative and, vice versa, the negative the positive. In this way, too, assets and debts are not two particular types of assets, obtaining for themselves. The same thing that in the case of the one, as debtor, is something negative is, in the case of the other, the creditor, something positive. …. Positive and negative are thus essentially conditioned by one another and only are [what they are] in their relation to one another. The north pole on a magnet cannot be without the south pole and the south pole cannot be without the north pole. If one cuts a magnet in half, one does not have the north pole in the one piece and the south pole in the other." (Ibid, pp. 184-185)

[7] An analogy arises with the interaction of various pieces of a magnet. Opposite poles are repelled from each other in a single magnet, but are attracted if they are poles of different magnets. As a result of the interaction, both magnets cease to exist independently, reunite and a new single magnet with opposite poles appears.

or for exchange). Therefore, everyone wants to achieve a profitable for himself proportion of exchange. But what is profitable for one side is unprofitable for the other. But that is already *a conflict of interests*.[8] Thus, the relationship of the parties is the *agreement* of conflicting interests, otherwise, the unity of mutually exclusive opposites. This is the contradiction.

The solution to this contradiction is a decision, an agreement followed by an action - exchange. As a result of the exchange, the seller of the goods will remain with the money and turn into the buyer. And the buyer will become the consumer of the purchased goods. But as a result of the consumption, he will produce a new product for sale and, consequently, will turn into a seller. That is, the parties change roles and will again begin interacting in the market with other sellers and buyers. There will be new contradictions, the resolution of which will lead to new actions. It repeats itself endlessly.

14. In any case, the decision-making is always associated with resolving the contradiction and implementing new economic actions. This applies not only to purchases and sales discussed above, but also to all other economic processes, including consumption and production, supply and demand, investment and consumption in debt, lending and borrowing, etc. The economic mechanism for the emergence and resolution of contradictions also operates at the macro level and sets the whole system of economic actions in motion. Although in all these cases, the process of the emergence and resolution of contradictions manifests itself in different specific forms, the essence of this does not change.

15. The actions of agents, as opposite sides of economic interaction, not only differ from each other but are also opposite. At the same time, the *actions* of the sides together constitute the same act of *interaction*, and do not make sense without each other. [9] Each side of the opposition both posits and denies the other side, relates to it both positively and negatively, and therefore, constitutes a whole opposition or is opposite to itself. This opposition to itself just is a contradiction. This contradictory unity of counter and mutually exclusive interests gives rise to a complex system of interactions between actors: the economy as a system of economic actions.

16. Being a producer, a consumer, a product, a resource, etc. - all these are not the inherent properties of subjects or objects, but the functions they perform. Man produces not because he is a producer. On the contrary, he is a producer because he produces, because he

[8] Thus, each side simultaneously relates to the opposite side, both positively and negatively. But this is a contradiction. Exchange means that what one side gives, the other side receives. It is in everyone's interests to receive from the opposite side as many goods as possible and to give as little as possible. But the act of exchange implies this or that exchange proportion. The parties cannot give each other more and receive less from each other. The agreement of the parties is the resolution of this conflict of interests.

[9] "Difference *in itselfis essential* difference, [the difference between] *thepositive* and the *negative*,…. Because each is for itself insofar as *it is not the other*, each *shines* in the other and is only insofar as the other is. The difference of the essence is thus the *opposition* according to which what is differentiated does not have an *other in general* but instead has *its* other opposite it. That is to say, each has its own determination only in its relation to the other, … and the same holds for the other. Each is thus the other's *own* other." (Hegel, 2010a, 182-183) "With the positive and the negative, one thinks that one has an absolute difference. Both, however, are in themselves the same and one could, for that reason, name the positive also the negative and, vice versa, the negative the positive. In this way, too, assets and debts are not two particular types of assets, obtaining for themselves. The same thing that in the case of the one, as debtor, is something negative is, in the case of the other, the creditor, something positive. … . Positive and negative are thus essentially conditioned by one another and only are [what they are] in their relation to one another. The north pole on a magnet cannot be without the south pole and the south pole cannot be without the north pole. If one cuts a magnet in half, one does not have the north pole in the one piece and the south pole in the other." (Ibid, 184-185.)

performs this function. But he is not only performing only this function. Therefore, he is not only a producer. When performing various functions, he becomes, respectively, a consumer, a seller, a buyer, an investor, a saver, etc. A similar statement is also correct for other economic phenomena. Moreover, the various functions performed by subjects, objects, and processes are interconnected, all the time transforming into each other, appearing and disappearing. These are the invisible "threads" that bind them together, forming the integrity that we call the economy. At the same time, to ensure the integrity of the economy, it does not matter precisely who, or what performs one or another function. The main thing is that all those functions necessary for the normal functioning of the economic system as a whole be fulfilled.

17. The sequence of emergence and resolution of contradictions is organized into a circular pattern and is endlessly repeated, being a source of ongoing activity and economic interaction of subjects. Resolving these contradictions implies not only the *actions* of the subjects, but the *interactions* between them. Since each subject produces goods for others, and for this, he consumes goods produced by others. But this circumstance, in turn, makes market exchange necessary. When one contradiction is resolved, a new one is born, and so on. The economic contradictions, while moving in a circle, cannot be finally resolved. Therefore, they arise repeatedly in the same sequence, again and again, which manifests itself in the form of ceaseless economic activity. But over time, because of evolution, the economy is transformed from a competitive economy to a monopolistic one, then to a financial monopoly economy. As a result, the economy comes to a dead end of stagnation. A systemic problem appears in which the mechanism for resolving economic contradictions that arise within the system ceases to work smoothly.

When this mechanism fails due to monopolization, financialization and increased inequality, the economy ceases to function normally. The economy falls into an attractor funnel from which it is impossible to get out and inevitably approaches a systemic crisis. In this case the contradiction already arises between the economic system and the external environment (ecological, social, political, cultural, etc.), the resolution of which implies the demise of an obsolete economic system and the birth of a new one.[10]

18. We have mentioned the different relation of formal and dialectical logic to the law of contradiction only to illustrate the differences between formal-logical and dialectical methods of explaining economic realities. But this, of course, does not exhaust the differences between these research methods. These differences manifest themselves in almost all key methodological problems, be it the understanding of historicism, the relationships between essence and phenomenon, the whole and the part, possibility and reality, freedom and necessity, etc. Differences in understanding these problems fundamentally change the interpretation of economic reality. Accordingly, the conclusions derived from the study of the economy by dialectical methods differ radically from the neoclassical interpretation of how

[10] The self-regulating decentralized market economy is being replaced by a centralized, regulated economy. But this will not mean a complete rejection of self-regulatory mechanisms and their replacement with Soviet-style planning. In a transformed form, the consumer market (and, until full automation of production is achieved, also the labor market) is likely to remain an integral part of the regulated economy, as an economic mechanism for revealing consumer preferences. That is, elements of decentralization and self-regulation will be retained in one form or another.

the market economy functions and how equilibrium and economic cycles are formed in it. According to their methodology, neoclassicists study only economic phenomena and external, visible connections between them. But such a theory cannot cognize the invisible inner connections between phenomena. Accordingly, it cannot cognize the essence of the economy and those deep structures that determine the integrity of the economy and the laws of its functioning.

By direct observation, it is impossible to perceive the economy as a unified system since economic facts are often perceived as independent from each other and, in some cases, as opposite and even mutually exclusive. By external observation, it is impossible to distinguish random connections from necessary, system-forming ones of the many connections that exist between phenomena. The study of an economic system implies the study of just internal, backbone relationships between phenomena hidden from external observation. Their study is possible only by dialectical methods, which are entirely ignored in neoclassical theory. Inadequate research methods are one of the main reasons for the current crisis in economic science.

19. **Constructivism**. In addition to dialectics and synergetics, this study is based on the ideas of sociocybernetics. Sociocybernetics brings together interdisciplinary research at the intersection of social sciences, general systems theory, cybernetics of the 1st and 2nd order, and constructivist epistemology. The main ideas of sociocybernetics originate in the sociological theories of T. Parsons and N. Lummann, in second-order cybernetics of H. Foerster, and others. The ideas of these scientists as applied to economic phenomena are discussed in more detail in the Appendix. Here we will touch on only some of the features of constructivist epistemology. For, constructivism dramatically changes the very logic of the perception of economic phenomena, and taking into account the features of this approach from the very beginning of the presentation will facilitate further understanding of the proposed concept. However, the influence of constructivism went far beyond purely epistemological research.

20. Constructivism emerged in the 1980s and gained a significant influence in epistemology.[11] However, the influence of constructivism went far beyond purely epistemological research. There is a close relationship between constructivism and synergetics. However, synergetics studies complex open systems in general, whereas constructivism concentrates on studying live cognitive systems. Constructivism had a great influence on sociology. Niklas Luhmann was the first sociologist who built his theory on the ideas of constructivism. His theory is a kind of "sociological version of constructivism".

But there are also differences between constructivism and synergetics. From a methodological point of view, synergetics is based on positivism, while constructivism is based on phenomenology. Accordingly, synergetics is more interested in the ontological context of studying processes in open non-equilibrium systems in general. And

[11] The scientific ideas of the psychologist J. Piaget, the biologists and neurophysiologists U. Maturana and F. Varela, the already mentioned cybernetics H. von Förster, the mathematician J. Spencer-Brown, the epistemologist, anthropologist and ecologist G .Bateson and others played an important role in the formation of the constructivist paradigm.

constructivism, thanks to its methodology, takes into account more fully the specifics of society as a cognitive, semantic system.

It pays more attention to the study of homeostasis and the processes of self-organization of living conceptual systems, based on the principle of feedback, which gives them stability. Of course, synergetics also studies the problems of self-organization, but from a broader perspective; the emphasis is on the study of the dynamics of complex systems in general, teetering on the brink of chaos and order.

21. According to constructivism, a man does not acquire knowledge about reality directly from objective reality, but he himself "constructs" reality in his mind. Therefore, such knowledge depends not only on the properties of the cognizant object but also on the values, meanings, motives for cognition of the subject and on the language of description, on the tools of cognition. At the same time, knowledge is not born in separate individuals, but is constructed by society.[12]

For example, "understanding" a phenomenon usually implies that what we do not know is reduced to what we know. That is, we relate it with other, already known phenomena. We consider it in a wider coordinate system. "A completely different 'understanding' is characteristic of social things (this term also covers human actions). In this case, it is not enough to relate the fact under consideration to other facts and things. I cannot understand a social thing without reducing it to the human activity that created it and relating this human activity to the motives from which it arises. I will not understand an instrument without knowing the purpose for which it was created; a sign or symbol without knowing what they stand for; an institution if not familiar with its aims; a work of art, if I do not delve into the artist's idea, which is embodied in this work." (Schutz, 2003, 104.)

22. Man perceives the physical properties of objects. Although there may be differences in observers' perceptions, they can be explained by objective reasons. This reality is what the constructivists call the reality of the first order. But there is another aspect of reality. These are the meanings and values the man assigns to these objects. This world of meanings and values constructivists call the second-order reality. Unlike the first-order reality, objects do not possess objective properties here. This world is the result of communication processes, the result of social construction.[13] (See: Watzlawick, 1997.)

For example, the physical properties of gold refer to first-order reality. Experiments can be used to determine these properties. But gold also has economic value, and its value has nothing to do with its physical properties. As an economic value, gold exists in a completely different dimension and is perceived by a person as a second-order reality, that is, as a reality constructed by him in his mind. This is the world of senses, meanings and values that a person creates, a social reality that exists not in the physical but in the intersubjective space. These are collective representations constructed in people's consciousness by their joint

[12] "The social world, in which I am bound by various relationships with others, is for me an object subject to semantic interpretation. It makes sense to me, but I'm sure it also makes sense to others. Moreover, I believe that my actions directed towards others will be understood by them in the same way as I understand their actions directed towards me. More or less naively, I assume the existence of a common coordinate system for my actions and the actions of others." (Schutz, 2003,109).

[13] "... giving a new form of expression to Shakespeare's remark, "There is nothing either good or bad, but thinking makes it so." The aspect of reality in the framework of which meaning, significance, and value are attributed is called reality of the second order." (Watzlawick, 1984, 237-238.)

efforts in a network of interactions and communications. But outside of consciousness, there is no economy, no politics, or culture in physical reality.

23. Through the senses, a man perceives the external facts of reality and forms ideas about them in his mind. But the sense organs cannot directly perceive the causal relations between them and cannot directly distinguish the essential connections between phenomena from the non-essential, accidental ones. He must himself logically complete these connections in his mind and, thus, construct a mental model of reality. Without the logical conjecture of these connections, external reality cannot be perceived as a whole, consisting of parts, as a system consisting of elements, and, therefore, cannot have any meaning for a person. Because "the truth is the whole" (Hegel). Only in this way can he create a holistic picture of the world that is understandable to himself, allowing him to coordinate his actions and realize his goals to more or less effectively.

24. Since consciousness cannot go beyond its own perceptions, and since there are no objective criteria for knowledge, a man is forced to turn to indirect methods of verifying his knowledge. For example, 1) the results of actions carried out based on this knowledge must be consistent with the goals; 2) the results of observations must be confirmed in various acts of observation; 3) the results of observations by different observers must match each other; 4) different observations and different models must confirm each other and fit logically into a single system of world view. Also, one or another concept can be recognized as "true" based on the mutual agreement of observers. In this case, the sharing the same concepts makes it possible to coordinate the actions of various actors and achieve common goals.

Dialectics, synergetics, and constructivism, as a methodological basis for the scientific study of economic reality, organically complement each other.

Section 1.
Purposeful activity

Since economic activity is one form of manifestation of purposeful activity in general, it is evident that research should begin with the primary element of activity - action. All actions mutually condition each other, forming the activity as a complex nonlinear system of actions.

1.1. Goal

1. “Everything flows and moves, and nothing remains,” Heraclitus claimed. Reality is changeable and contains various possibilities for its transformation. But which of these possibilities will be realized - depends on mere coincidence. Possessing reason, a man cognizes these possibilities and the laws of nature, according to which these transformations take place. Having cognized these possibilities, he desires not to leave these changes in reality to chance, but to realize those that correspond to his needs and purposefully create the desired reality. The mere knowledge that he has the possibility to bring reality into line with his needs gives rise to dissatisfaction with the existing reality and a desire to change it. And the goal is the desire to satisfy the need and restore harmony between what is and what should be. “Need and drive are the examples of purpose lying closest at hand. They are the *flit* contradiction that takes place *within* the living subject itself …. The *satisfaction* produces the peace between the subject and object, …” (Hegel, 2010, 277.) At the same time, it should be taken into account that the need underlying the goal is not a contradiction between the existing reality and a man’s *ideas* about what should be, but between the *very ideas* about *what is* and *what should be* in his mind, “within the living subject itself”. For, according to the constructivists, the existing reality is only given to the subject as a system of representations, a mental construct in his mind. He does not know what reality is, in fact, outside of his consciousness.

2. However, the cognition of possibilities generates only *potential needs*. Their implementation requires practical actions. And for this, you need to own the appropriate means. The subject’s will must extend over objects so that he can, by influencing them, change reality in the desired direction. Potential needs are transformed into actual needs only when the subject owns the real means of satisfying them and, therefore, when only his will, his decision will determine which needs to satisfy, and which ones to abstain. It's because the means are limited, and reality contains many possibilities for its transformation. But different possibilities give rise to different needs. Some are more desirable, others are less desirable,

and some are mutually exclusive. A man must make a choice. It's because the choice of one alternative means the rejection of others.

The subject, having made a choice, sets a goal, finds means and implements it, and as a result, gets the realization of the chosen possibility of transforming reality. But this realized possibility is a new reality and, as such, contains new possibilities that give rise to new potential needs, and everything is repeated. The choice of goals and the actions of a man are aimed at changing reality in such a way that it contains more possibilities to satisfy his needs and would provide him with more freedom of choice.

3. It is impossible to choose one desired good without giving up other desirable goods. "Of two things both of which he (a man – auth.) cannot have together he selects one and gives up the other. Action therefore always involves both taking and renunciation." (Mises, 1996, 12) But to make such a decision and abandon them requires a strong-willed effort. [14] In other words, these are efforts associated with *abstinence* from satisfying alternative needs. In addition, the realization of the goal is also related to the *risk* of losing means. After all, the results will come only in the future, after spending the means. But getting results are not guaranteed. If the results do not meet the goals, the means will be irrevocably lost. The presence of risk also necessitates strong-willed efforts to realize the chosen goal.

1.2. Means

1. Means are necessary to realize the goal. The means represent the part of the existing reality - the and are objects defined through the goal. The goal is something external to the object itself. Therefore, the objects in themselves are not means. They are means only in relation to the goals. "A means is what serves to the attainment of any end, goal, or aim. Means are not in the given universe; in this universe there exist only things. A thing becomes a means when human reason plans to employ it for the attainment of some end and human action really employs it for this purpose. Thinking man sees the serviceableness of things, i.e., their ability to minister to his ends, and acting man makes them means. It is of primary importance to realize that parts of the external world become means only through the operation of the human mind and its offshoot, human action. External objects are as such only phenomena of the physical universe and the subject matter of the natural sciences. It is human meaning and action which transform them into means." (Mises, 1996, 92.).

Goals and *means* are correlative concepts. The goals can only be real if appropriate objects that can serve as means for these goals are found. Goals without means are not actual goals, but only *potential goals* that will become actual only after the means appear. Likewise, objects can be perceived as means only if there are actual goals for the realization of which they are needed. There is no goal without means or means without a goal.

[14] "The will will make such a decision only after the approval of the mind, which, in the process of motivation, is guided not by random, momentary, but by the general, reasonable needs of the "Ego". Accordingly, the decisions made by the will are based not on the calculation of feelings of comfort and discomfort, but on the arguments and evaluations of mind, proceeding from the common interests of the subject. These are rational decisions." (Leiashvily, 2011,.24-25)

2. The fundamental property of means is that it *"is such a means by virtue of its vocation that it be used"*. (Hegel). Since, in the process of realizing goals, the means are sacrificed (worn out, destroyed) the realization of goals and the satisfaction of needs must be *"paid for"* by the means. In this sense, we can say that every action is an *"exchange"* of means for results.

The ability of means to serve goals and satisfy needs is *utility*. But, as a result of this "exchange", along with the means, its utility is also lost. This lost utility is perceived by the subject as a *cost*. In other words, both utility and cost are the *subjective attitude* of a man to objects serving as means, respectively, before and after satisfaction of a need (realization of a goal). "The limited nature of objects, serving as means, compels the subject to make thrifty use of them, and after their use to consider them as costs, to take into account these costs and compare them with size of the needs satisfied with them. If that which is necessary for realization of ends is not limited, then it is not considered as means any more, and not perceived as costs, the attitude toward it is not careful. This already is not a means, but is a condition of activity. The limited nature of means necessitate to compare the expenses of means with the received results, what can not be said concerning conditions. Realization of ends depends only on presence of conditions. But quantitative definiteness of conditions is not taken into account because of their limitlessness." (Leiashvily, 2012, 17-18)

Since useful means have to be sacrificed for the sake of the goals, the subject treats the means thriftily and economically. This implies abstaining from the satisfaction of less important needs. But, as noted, abstinence requires strong-willed efforts. This confirms that purposeful activity is impossible without strong-willed efforts associated with *risk* and *abstinence*.

1.3. Result

1. The result is a realized goal, otherwise, a satisfied need. As a goal, the idea was embodied in reality, and the contradiction between *what is* and what *should be* was resolved. Thus, the mind generates ideas, and the will realizes them, transforms reality, and connects the world of ideas and the real world, creating the world of artifacts, the world of culture.

At the same time, we recall that the contradiction between *what is* and what *should be* exist only in the subject's mind as a *subjective contradiction between his ideas* about *what is* and *what should be*. However, the final result of resolving this subjective contradiction is an actual change in reality. To realize his goals, a man brings real objects of reality (one of which is the person's body itself) into interaction, thereby initiating empirical processes leading to the desired result. "Reason is as *cunning* as it is *powerful*. The cunning consists generally in the activity of mediating, which, by letting the objects, in keeping with their own nature, act on one another and wear themselves out on one another, without meddling immediately in this process, achieves *its* purpose alone." (Hegel, 2010, 281.)

Like the culture he creates, Man is a "crossing point" of the real and the ideal, the objective and the subjective. It is the unity of spirit and body.[15] The human body is subject to his mind and will.[16] The human body, in which his mind is embodied, is itself one object of the physical world. The mind treats the body as a means to its goals. Through a will, a person forces his body, like ordinary objects, to interact with other objects, realizing the set goals.

2. The very interaction of objects that serve as a means of achieving the goal occurs according to the universal laws of nature. From the point of view of the laws of nature, the processes provoked by the human will, and the processes generated by chance, do not differ from each other. Therefore, knowledge of the laws of nature is a condition for achieving the goal.

"Man is in a position to act because he has the ability to discover causal relations which determine change and becoming in the universe. Acting requires and presupposes the category of causality. Only a man who sees the world in the light of causality is fitted to act. In this sense we may say that causality is a category of action. The category *means and ends* presupposes the category *cause and effect.* ….. Where man does not see any causal relation, he cannot act." (Mises, 1996, 22.).

The result differs from the effect only in that it was generated by the purpose of a man, his mind and will, and not by natural causes manifested through chance. Natural reality contains countless possibilities for the development of processes. And all of them are consistent with objective laws. But which of these possibilities will be realized depends on mere coincidence. Purposeful human activity is a kind of *matrix* superimposed on this causality of nature and channeling cause-and-effect processes in connection to his needs. Therefore, purposeful activity does not and cannot contradict the objective laws of nature. It only displaces randomness from nature with reasonable goals, thereby consciously choosing the direction of changing reality from many other possibilities.

3. Just as every effect is the cause of other effects, so every result is a means to new ends and for obtaining other results. "The purpose attained is thus only an object that is also in turn a means or material for other purposes and so on ad infinitum." (Hegel, 2010, 281.)[17] It turns out that every result is a means for obtaining other results. Moreover, every result is a realized goal, and the goal, in turn, exists only in the presence of means which are themselves results. That is, the goal, the means, and the result are reflective concepts endowed with meaning only through each other, and without each other, they have no meaning.

[15] Man is a connecting link that combines spiritual and physical principles. The spirit of man is the unity of knowledge and feelings, the unity of his intellect and will. The intellect cognizes the world, and the will transforms it.

[16] "... the soul ... must master its body, create from it a malleable and convenient instrument of its activity, ... The body is the environment through which I generally come into contact with the outside world. Therefore, if I want to fulfill my goals, then I must make my body capable of translating this subjective into external objectivity." (Hegel, 1977, 208)

[17] "… all objects in which an external purpose is realized equally are, therefore, only a means of purpose. Anything which is intended for the realization of a purpose and is taken essentially as a means, is such a means by virtue of its vocation37 that it be used up." (Hegel, 2010, 666) "Every goal achieved immediately becomes a means to a new goal, which in turn becomes a means to a new goal, and thus the kingdom of means stretches on without end. On the other hand, every goal is achieved by the application of a multitude of means, which serve the goal and turn into means, so that the subject uses himself and wastes himself as little as possible. In this inventive prudence, which makes objects work and spend instead of personality, consists, as Hegel says, "the cunning of reason." (Fischer, 1902, 569.)

4. In their desire to satisfy their needs, individuals interact and coordinate their actions to achieve joint goals and meet needs that can be satisfied only by joint efforts. In the interaction of individuals, the *results* of the purposeful actions of each individual are *means* for other individuals. Thus, purposeful action takes the form of *social action*,[18] which underlies the *division of labor*.

The division of labor is linked to specialization. Separate spheres of collective activity arise — material production, science, education, culture, etc. Each subject produces material, social or spiritual goods for others, while he himself consumes the goods produced by others. Feedback occurs. At the same time, under the conditions of the division of labor, everyone specializes in producing of *one* good, and for this he consumes many different goods, each produced by others who also produce one good and consume many other goods, etc. This form of organization of connections between the subjects' actions forms a closed system of social actions that has a *network* pattern in which all produces goods for others and consumes the goods produced by others. Satisfaction of one's needs becomes possible only by satisfying the needs of others. The result of collective actions is society as a complex, nonlinear system. Thanks to the feedback described above, it is capable of self-regulation and has its own laws of functioning and development.

1.4. Value

a) Fractality of action

1. The action has a fractal character, it has the property of self-similarity. Action at any level has the same teleological structure: goal, means and result. A means is anything that serves to achieve a goal. The results of some actions are a means to get results in other actions. But results are objectified actions. Accordingly, some actions are the means for implementing other actions, for larger, more distant goals.[19]

[18] "We shall speak of "action" insofar as the acting individual attaches a subjective meaning to his behavior – be it overt or covert, omission or acquiescence. Action is "social" insofar as its subjective meaning takes account of the behavior of others and is thereby oriented in its course." (Weber, 1978, 4.) "Thus, money is a means of exchange which the actor accepts in payment because he orients his action to the expectation that a large but unknown number of individuals he is personally unacquainted with will be ready to accept it in exchange on some future occasion.) .... . The economic activity of an individual is social only if it takes account of the behavior of someone else. Thus very generally it becomes social insofar as the actor assumes that others will respect his actual control over economic goods. Concretdy it is social, for instance, if in relation to the actor's own consumption the future wants of others are taken into account and this becomes one consideration affecting the actor's own saving. Or, in another connexion, production may be oriented to the future wants of other people." (Ibid., 22.)

[19] "Human life is an unceasing sequence of single actions. But the single action is by no means isolated. It is a link in a chain of actions which together form an action on a higher level aiming at a more distant end. Every action has two aspects. It is on the one hand a partial action in the framework of a further-stretching action, the performance of a fraction of the aims set by a more far-reaching action. It is on the other hand itself a whole with regard to the actions aimed at by the performance of its own parts." (Mises, 1996, 45.) "A cathedral is something other than a heap of stones joined together. But the only procedure for constructing a cathedral is to lay one stone upon another. For the architect the whole project is the main thing. For the mason it is the single wall, and for the bricklayer the single stones. What counts for praxeology is the fact that the only method to achieve greater tasks is to build from the foundations step by step, part by part." (Mises, 1996, 45-46.)

Depending on the value of the planned results, in each specific case, an actor views the coordination and subordination between particular actions through the prism of the correlations between goals, means, and results differently. For example, if actions are evaluated from an economic point of view, then political and legal actions, respectively, their results, can be considered only as means for implementing purely economic goals, for the creation of economic values. But if the subject realizes political goals, then economic, moral and legal actions can be considered as means for obtaining political values, for growth of power, etc. But in any case, the empirical basis of all actions does not change, and is subject to the same laws of nature, society and spiritual life. That is, all actions always make some changes in the existing reality, whether it be living or inanimate nature, physical reality or the spiritual world. But the value attitude to these changes depends only on the subject's will, his decision - in which system of values to plan and evaluate his actions and the changes they produce in the natural, social and spiritual spheres. Value preferences and motivations, unique for each individual or collective subject, determine which values will dominate in the process of making certain decisions and carrying out the corresponding actions.

2. Human activity is based on values. For, a conscious choice of goals, means, and, results, is possible only based on values.[20] But which values are seen as goals, i.e. future results, and which are seen as means sacrificed to these results? And how does the choice of goals and means and, consequently, the choice between different values take place?

Goods cannot satisfy human needs on their own. A man satisfies his conscious needs (whether material, social or spiritual) through his conscious actions. He does it only based on his voluntary acts and decisions. Values are the teleological attitude of the subject to everything that gives him the freedom to make decisions and the ability to act based on freely chosen goals.[21]

There are various kinds of values - vital, social, political, economic, scientific, aesthetic, moral, religious, etc. But all these particular kinds of values have the same essence, a single nature. That's what makes it possible for them to constitute a single system of values, without which purposeful activity in general would be impossible.

[20] "A man freely creates when he introduces something fundamentally new into the world, something that has not yet existed. Of course, this can be achieved only by using as means available, actually existing things and forces. Thus, the latter acquire the character of instrumental values. And since they can be valuable only insofar as they are suitable for achieving the goal, it is clear that the source of the value of means should be considered the value of the goals achievable with their help. In this ... sense, the expression "the goal justifies the means" is true. And all this means that the root of values must be sought in the target values, in the values-goals. Goals, as you know, before their realization can exist only ideally, otherwise, it would be pointless to strive for their realization." (Chavchavadze, 1984, 38-39.)

[21] "If something is recognized, chosen as a goal, it is thereby recognized as valuable, having either the value of a goal in itself or the value of a means to achieve some other goal, an instrumental value. This also means that the target determination of human activity is a value determination. Goals can affect human activity not in a real-causal way, but as ideal values, ..." (Chavchavadze, 1984, 8).

b) Value as a phenomenon of consciousness

1. A complete value analysis cannot be carried out without a phenomenological approach.[22] From the phenomenological point of view, what matters for understanding the subject's activity is not the real object but how it is perceived and experienced in the subject's mind, because "a veritable abyss yawns between consciousness and reality". (Husserl, 1983, 111). Perception can be distorted or even an illusion. Still, from the point of view of phenomenology, this does not matter since it is not the real object itself that opposes consciousness. For consciousness, it is fundamentally inaccessible. An attempt to go beyond consciousness and "reach" a real object is meaningless.[23]

There is no causal connection between a real object and the experience of an object in consciousness in the sense that it exists in the real world. Real facts are the causes of other real facts in the real world. But we cannot say in the same sense that real facts are the direct cause of mental facts. In his consciousness, the subject experiences not the facts, but the essence of the facts. Therefore, there is no causal connection between the experience and the object of experience, not an actual connection, but an essential one. The very essence of experience implies only an indication of the object. Therefore, this connection is considered outside the context of space, time, and causality. In this sense, the objects of the real world are not the causes of the experiences of consciousness. Accordingly, it is not the concept or representation and reality that should be opposed to each other, as in classical metaphysics, but the experience of consciousness, an *act of consciousness*, on the one hand, and, on the other hand, the *mental representation* of an object, the subject content of thought.

An act of consciousness can be perception, desire, evaluation, judgment, etc. Its fundamental property is that it always has its focus on one or another object, regardless of whether this object is real or not.[24] And the mental *representation* regarding the object (the object content of thought) has a content that connects it with the intended object.[25] Meaning can change in different acts of perception of the same object. Therefore, the subject may give

[22] "The phenomenology of E. Husserl, a universal science of being, allows us to give apodictically reliable foundations for such science as economic theory. On these grounds, it is only possible to build a coherent edifice of theory, which would not only give us ideas about cause-and-effect relationships but would also be fruitful in all respects." (Usanov, 2010, 56).

[23] "…consciousness considered in its *"purity"* must be held to be a *self-contained complex ofbeing*, a complex of *absolute being* into which nothing can penetrate and out of which nothing can slip, to which nothing is spatiotemporally external and which cannot be within any spatiotemporally complex, which cannot be affected by any physical thing and cannot exercise causation upon any physical thing - it being presupposed that causality has the normal sense of causality pertaining to Nature as a relationship of dependence between realities." (Husserl, 1983, 112.)

[24] "… a perceiving is a perceiving of something, perhaps a physical thing; a judging is a judging of a predicatively formed affair-complex; valuing of a predicatively formed value~complex; a wishing of a predicatively formed wish-complex; and so forth." (Husserl, 1983, 200.)

[25] Edmund Husserl explains the difference between a real object and an idea about it in this way: "The *tree simpliciter,* the physical thing belonging to Nature, is nothing less than this *perceived tree as perceived* which, as perceptual sense, inseparably belongs to the13 perception. The tree simpliciter can burn up, be resolved into its chemical elements, etc. But the sense - the sense *cifthis* perception, something belonging necessarily to its essence - cannot burn up; it has no chemical elements, no forces, no real properties." (Husserl, 1983, 216.)

a different meaning to the same subject i.e., perceives it from different points of view, including in the coordinate systems of different values.

2. Due to the perception by the principle of analogy, the subject will find another subject similar to him. Another, i.e., a subject different from it, appears. As a result, for him and for the other, the subjective world becomes a common objective (intersubjective) world. This intersubjective world acquires objectivity only in relation to the consciousness of an individual subject, but for the consciousness of a collective subject, it remains subjective. "All we are dealing with is our own representations (Vorstellung) or memory. When we cognize or recognize something, we correlate our experience today with what happened yesterday and the day before yesterday, that is, again, with our experience and not with things. Cognition is a comparison of some experiences (elements of practice) with others and not experiences with the world. That is, in cognizing, we are dealing with ourselves, with our own representations (German: vor + stellen - what we already have in ourselves) or representations that relate us to ourselves. Through representations, we construct the world. What we receive from the sense organs is only the quantitative side of sensory experience, while the qualitative side comes from the subject himself, from ourselves. ..... Von Glasersfeld considered J. Piaget's idea revolutionary that "the goal of 'knowledge' is not the representation of reality, but the provision of adaptation to it" (Князева, 2014, 17) And since there is not a causal but only an essential connection between real phenomena and ideas about them, the perception of the same reality is possible in different ways, depending on what meaning is put into it.[26] The same object can be perceived as a product or a resource; the same subject - as a citizen, parent, or owner; certain phenomena can be perceived as significant or insignificant, useful or useless, interesting or not interesting, etc. Not only do different subjects have different attitudes towards the same phenomena, but the same subject perceives them differently, depending on what meaning he puts into them.

All the above applies to values as well. The value attitude is fully contained in consciousness, and, like thinking, it cannot go beyond the limits of consciousness. It is the subject's attitude to his own representations, to the ideal constructs created by him. Both individual and social values are phenomena of an individual or collective consciousness. External correlates of such experiences are real objects and processes. In the sphere of the economy, for example, objects are not, in themselves, products or resources, and they have no value for a man if there is no need for them.

3. It seems strange that economic values are a voluntary attitude of the subject not directly toward the *objects* but only toward his *representations* about objects. But the point is not only that a value experience cannot go beyond the limits of consciousness, but also that a value attitude is conditioned only by those properties of objects regarding which the subject knows, or thinks he knows, and not by the actual properties regarding which the subject does not know and cannot know. That means his representations matter, even if they are false or

[26] "After all, these "meanings", substantive meanings, noematic meanings are the formations of my experience. They are sensitive to what I am experiencing at the moment and what I think about it, what conclusions I draw, ... The noematic meaning is highly dependent on me: depending on how I experience something, how I posit something, what is supposed to be modified, ... But the physical things themselves seem independent of me, of the behavior of my consciousness. (Ingarden, 1999, 178).

illusory. But the *"location"* of representations about objects and, consequently value attitude to them is the subject's consciousness. They cannot be outside of consciousness.

Therefore, for the subject to experience a value attitude, it is not at all obligatory to have direct contact with the real object, it is not obligatory, even its existence at all.[27] For example, the economic value of a house, as a phenomenon or experience in the consciousness of its owner, does not at all require the existence of this house in the perimeter of its direct perception. The owner may be far from the property, but consequently, his experience of the value of his property does not undergo any changes. Moreover, even if, for example, the house is burned down in a fire, this experience of value remains unchanged until the owner of the house is informed about what happened; that is, until his perception of the object of experience changes. The subject "carries with him" all his values in his consciousness.

c) "Calculation" of values

1. Value is the subject's attitude not directly to real objects, but only to the representations of them in consciousness. It can change in various acts of consciousness. In various acts of perception, a man can put different meanings into his representations. A man's value attitude to this or that phenomenon depends on what specific properties of this phenomenon are in the focus of his representations and on the possibility of satisfying what specific needs he sees in these properties. The subject can perceive the same phenomena in different scales of values (vital, economic, political, social, moral, aesthetic, religious, etc.).

2. Man creates values through a purposeful transformation of reality. What he creates in this process is only a form with the help of which reality gains the properties he desires and comes in line with his needs. By creating material and spiritual values, as a result of purposeful transformations of reality, in the physical, social and spiritual spheres, more and more new opportunities for realizing new goals appear, and a man gains more and more freedom. As a result of the transformation, reality acquires some new properties, while others disappear or remain unchanged.

Although, in general, the transformation of the living environment for humans is aimed at increasing his freedom and opportunities for the realization of new goals, but as a result of each individual act of transforming reality, the possibilities of satisfying some needs increase more, others less, and others decrease or do not change. Since a man perceives the attitude toward these opportunities as values, then, due to his every actions, some values are created, some are destroyed, some remain unchanged. Reality transformations are carried out in physical time. But time is irreversible. Therefore, the realization of some opportunities is associated with the destruction of alternative opportunities. Therefore, before each action, a choice has to be made. When realizing one of the opportunities one has to give up - others. In order to create value, we have to abandon creating alternative values. In any field of activity,

[27] "Value is always value for something and someone; therefore it is obvious that it is not a natural-real sign of things. This is especially clearly seen when comparing the value with the properties actually inherent in the object. While the existence of a property depends entirely on the existence of the thing itself, the existence of a value does not depend on the actual existence or non-existence of its bearer. The value (and its "being" as a value) of absolute justice, for example, is not in any way impaired by the fact that it is still far from being fully realized in the world." (Чавчавадзе, 1984, 36).

while creating some values, others are sacrificed. All man-created goods, both material and spiritual, are thus valuable and not merely *useful* precisely because the *"price is paid"* for them.[28]

3. Man, as a person, is integrity and has a single system of values, which covers all his material and spiritual values. Accordingly, individuals make all their decisions based on a single value system. "Choosing determines all human decisions. In making his choice, man chooses not only between various material things and services. All human values are offered for option. All ends and all means, both material and ideal issues, the sublime and the base, the noble and the ignoble, are ranged in a single row and subjected to a decision which picks out one thing and sets aside another. Nothing that men aim at or want to avoid remains outside of this arrangement into a unique scale of gradation and preference." (Mises, 1996, 3.)

When setting goals and making decisions in one form or another, one has to make a choice between different values, determine priorities, make a "calculation" of goals and the sacrifices associated with them.[29] Marking the boundaries of the expediency of creating a particular value by sacrificing other values to it occurs based on the entire value system. For example, political, social, moral, aesthetic, religious or other values cannot be ignored when creating economic value. Some of them are sacrificed, others are created in parallel, and some remain unchanged. There are limits within which the subject can act at the expense of other values. Beyond these boundaries, the sacrifices outweigh the results, and the action loses its meaning. Without such a "calculation" of gained and lost values, purposeful activity cannot be *purposeful*.

4. This means that there is some common criterion for comparing different values with each other, including material and spiritual ones. Without this, it is impossible to make a choice, and without a choice, no purposeful activity is conceivable. Such a criterion is the *increase in freedom* that this or that particular value confers on man. All specific values are various forms of manifestation of value in general, value as such. This universal value, to which all particular forms of value are reduced, and to which man strives by his activity, is *happiness*.[30] "There is however no valid objection to a usage that defines human action as the striving for happiness.." (Mises, 1996, 14.)

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[28] A value acquired by chance, received as a gift or as an inheritance, is perceived by its owner more as a simple *utility*, than as a *value*. Although the "payment" is not always material goods, the *life time* and *spiritual energy* of the creator (associated with risk, abstinence and the process of creation) are those existentially valuable, initially limited resources that must be sacrificed for the implementation of any act of value creation. Moreover, any specific form of manifestation of value is an emanation of freedom as the highest value associated with happiness. Consequently, the very *possibility of the existence* of values as such is born of the fact of a man's limited life time and spiritual energy, but the *possibility of their creation* - with the presence of free will of a rational person striving for happiness, associated with freedom. Ultimately, this process of creating values with the help of values is a process of self-growth of human freedom and the world of culture created by him, which is nothing but the world of embodied values.

[29] An example from economic life: each customer, buying a product or service, already makes a choice between economic and non-economic values by the very fact of the purchase. For, in this case, money (as an economic value) is exchanged for specific goods that have non-economic value for its buyer, intended to satisfy its specific non-economic needs. Of course, purchasing goods also implies a commensuration of economic values (related to the problem of distribution of money, alternative value, the possibility of obtaining economic benefits from speculative operations, etc.).

[30] But this means it depends only on the subject himself in what he sees as happiness. It depends on his choice what specific set of individual goods, and what special values represented in them form his

Happiness is associated with the growth of human freedom, i.e. increased opportunities to satisfy freely chosen goals. Happiness is a universal value and, as such, is an abstraction into which each person arbitrarily puts their own meaning. A man himself fills it with specific content, a specific composition of specific values, as various forms of its manifestation. Therefore, happiness is manifested in man's freedom to determine his own goals and realize them. "But the truth of the particular satisfactions is the universal, which under the name of happiness the thinking will makes its aim. … it is the subjective feeling and good pleasure which must have the casting vote as to where happiness is to be placed. … Happiness is the mere abstract and merely imagined universality of things desired,—a universality which only ought to be. But the particularity of the satisfaction which just as much is as it is abolished, and the abstract singleness, the option which gives or does not give itself (as it pleases) an aim in happiness, find their truth in the intrinsic universality of the will, i.e. its very autonomy or freedom." (Hegel, 1894, 99.)

One must choose a goal (future result) and means to carry out an action. The criterion for this choice is value itself. That is, in the process of purposeful activity, the realization of the opportunities provided by values occurs if its result gives rise to more opportunities to satisfy needs and more freedom of choice. That is, purposeful activity implies the creation of values by means of values, the increase in the degree of freedom by means of the realization of freedom, and, ultimately, the pursuit of happiness. "A man freely chooses life and thereby chooses an action that is aimed at creating more and more opportunities for freedom. The "vital action" of a man, with its essential tendencies, is a free action that transforms the world in the direction of providing ever-increasing opportunities for free-unlimited action." (Kakabadze, 1985, 16-17.)

5. The above can be summarized as follows – creating value gives meaning to every action. But, as a result of action, there is a parallel creation of some values, and sacrifice of others. That is, as a result of each action, between the result's values (which is the purpose of the action and determines its meaning) and other values of the actor's value system, the complementary, mutually exclusive or neutral relationships are established. Therefore, every decision when choosing goals is a compromise solution.

The subject creates a certain value in every action. Otherwise, the action has no meaning. But there are boundaries within which it can act at the expense of other values. And he can't overstep those boundaries. Moreover, he commensurates the increase in the created value with the damage that he can suffer on the scale of other values. And only considering such a "calculation" of all values, he makes a decision. Therefore, in the choice of goals and means, there is an area of permissible decisions beyond which, according to the above

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understanding of happiness. In this understanding, happiness is no longer just an abstraction but is a *concrete-universal* concept filled with specific content. Happiness, in this understanding forms a system of motives and incentives for the subject's activity. It follows that real happiness lies in the very freedom to choose one's value priorities and actions corresponding to them. "Happiness is the goal of man's goals. ... For the sake of realizing some of his desires, a person has to put aside for a while others and completely forget about the third ones. ... It turns out that happiness, understood as the goal of man's goals, is unattainable. ... Some desires are realized, but others appear. We begin to understand that although much of what we would like has not been realized, it is thanks to this that we have been able to do what we have done. ... The very possibility of choosing one's desires is true happiness. Real rather than imagined happiness lies in the freedom to choose one's desires, in the possibility of independently determining one's life path." (Trufanov, 2011, 190-191)

general criterion, the sacrificed values outweigh the value of the chosen goal. From this point of view, in purposeful activity, the general vector of which implies an increase in freedom, not only “the end justifies the means”, but also “the means justify the end”.

Moreover, the subject makes these decisions considering the commensuration not only of various specific values (material, spiritual, etc.), but also the differences between *individual* and *social* values. For he evaluates his actions not only based on a subjective system of values, but, being a social entity, he evaluates his actions “through the eyes of society”, from the point of view of social values.

Section 2
Subsistence economy

2.1. Production and Consumption

1. All areas of activity are interconnected and depend on each other - economics, politics, law, morality, culture, science, etc. All these areas of activity require material resources. The production of non-material goods also needs the consumption of material goods, and vice versa, the production of material goods needs the use of non-material goods, such as knowledge, experience, education, law, security, health, social stability, etc. Since the material resources available to the subject are limited, to maximize the satisfaction of all needs, it is necessary to distribute material resources optimally between various areas of activity.

The rational distribution of material resources requires decision-making based on the commensuration of economic costs and results. But this requires a commensuration not only between economic values but also between economic and non-economic values. It follows from this, as has already been shown, that all actions and all values of the subject, both material and non-material, determine each other and are interconnected in a single system. In short, implementing actions in any field of activity, one way or another, requires a commensuration of costs and results, but this is impossible without a commensuration of different values.

2. Man cannot create economic goods out of anything. He only creates a form.[31] He only transforms one object into another, making them act on each other to get the desired result. In this sense, the consumption and production of economic goods is the *transformation* of some goods into others; in a certain sense – the *exchange* of consumed goods for goods produced. Therefore, consumption and production are not two different processes but the same process seen from different perspective. For, the very production of some goods is the consumption of other goods, and vice versa. "Production is thus at the same time consumption, and consumption is at the same time production. Each is directly its own counterpart." (Marx, 1998, 7-8.) "Each appears as the means of the other and as being brought about by the other, which is expressed as their mutual interdependence; a relation, by

[31] "Man cannot create material things. In the mental and moral world indeed he may produce new ideas; but when he is said to produce material things, he really only produces utilities ; or in other words, his efforts and sacrifices result in changing the form or arrangement of matter to adapt it better for the satisfaction of wants. All that he can do in the physical world is either to readjust matter so as to make it more useful, as when he makes a log of wood into a table; or to put it in the way of being made more useful by nature, as when he puts seed where the forces of nature will make it burst out into life." (Marshall, 2013, 53.)

virtue of which they appear as mutually connected and indispensable, yet remaining outside of each other." (Ibid., 9.)

3. Consumed goods are resources, and produced goods are products. And since each good is produced through the consumption of other goods, and is consumed for the production of other goods, then each good is both a product and a resource, their unity. In the course of the functioning of the economy, the processes of production and consumption, as well as the relationship between products and resources, are intertwined in a complex network of relationships. Namely, *each* good is produced and consumed through *different* processes (produced in one process and consumed in another). On the other hand, *different* goods are consumed and produced in *each* process (some are consumed and others are produced).

At the same time, *each* good is produced by consuming *many* other goods. And *each* of these consumed goods is also produced by *many* others, and so on. On the other hand, *each* type of produced goods takes part as *one* type of consumed goods in producing *many* other types of goods, and so on. Such an interweaving of all the processes of goods' transformation takes the form of a closed system with a network form of organization.

All goods are produced and consumed within this closed network of economic actions. As a result, a self-referential nonlinear system is formed, which is self-regulated based on feedback. For optimization, this system can open up and import and export goods to other similar systems on equivalent terms while maintaining equilibrium within the system. Here, the interacting systems become subsystems of a more extensive closed system, within which each retains its autonomy.

4. Since every good is produced and consumed in the process of mutual transformation, the man himself, who drives these processes is simultaneously the producer and consumer, treating the goods consumed as resources and the goods produced as products. Moreover, as an empirical object, a man is a product of his activity, reproducing with his activity not only the goods he consumes but also himself. In this process, he is the main "resource" and the main "product". From a purely economic point of view, the man himself appears as an economic good, which, like all economic goods, is "consumed" to produce other goods and "reproduced" by consuming other goods. It is a closed circular process of transforming some goods into others, which gains economic meaning only for the Man having reason, will, interests and values. He is the source of activity and the main focus of reference for all economic processes.

2.2. Production sector and consumption sector

a) Primary resources and final products

1. A person satisfies his needs through his own activity. Before consuming goods, he must produce them. Accordingly, the economy comprises two sectors - the *production sector* and the *consumption sector*.[32] But this division is conditional because goods are produced by

[32] *"Consumption* may be regarded as negative production. Just as man can produce only utilities, so he can consume nothing more.He can produce services and other immaterial products, and he can consume them.

consuming goods, and the consumption of goods is itself the production of goods. Therefore, each of these sectors is the unity of the processes of production of products and consumption of resources. The unity of these two mutually opposite sectors is because the products produced in each of these sectors are resources consumed in the opposite sector. Thus, neither of these sectors can function without the other.

2. In the production sector, final products are produced, and primary resources are consumed for this purpose. In the consumption sector, on the contrary, final products are consumed, and primary resources are reproduced. The division of goods into primary resources and final products is also conditional. Because both are goods, and as such, they are both products and resources. Therefore, the final products of the production sector are the primary resources of the consumption sector, and the primary resources of the production sector are the final products of the consumption sector.[33]

Besides final products and primary resources, the production and consumption sectors also produce *intermediate products* (or, *intermediate resources*, which is the same thing). But, unlike final products and primary resources produced in one sector and consumed in another, they are consumed in the same sector in which they are produced, i.e., are intended for internal consumption in the sectors. In addition, intermediate goods are usually more specialized and intended to produce relatively narrow groups of final products. In contrast, primary resources have a more universal purpose and are used in the production of all final and intermediate products.

3. It is important to note that the primary resources are not the factors of production but their services. But to use these services, the subject must own the production factors. That is, the subject's will must extend over the production factors. And the production factors are Labor force, Land, Capital and Entrepreneurship.

For example, the labor force as a production factor is the ability to work, the unity of a man's physical, intellectual and spiritual capacities. But the primary resource for producing products is not the ability to labor, but the labor itself. If these abilities are not used, they cannot produce anything. And the use of these abilities, or the services of this factor, is precisely labor,[34] as a limited primary resource that should be distributed to produce various products. Similarly, Land, Capital and Entrepreneurship are the production factors, and their services are the primary resources.

4. All production factors, including the Land as a *production factor*, are reproduced by man in the sense that by themselves, natural or man-made objects, and even the very ability

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But as his production of material products is really nothing more than a rearrangement of matter which gives it new utilities; so his consumption of them is nothing more than a disarrangement of matter, which diminishes or destroys its utilities." (Marshall, 2013, 53-54.)

[33] In order to avoid confusing the terms, unless otherwise specified, the terms "primary resources" and "final products" will refer to primary resources and final products in relation to both the production sector and the economy as a whole. But if the same terms are underlined, they will mean primary resources and final products, in a broad sense, i.e. as *relative concepts*. In this sense, the primary resources of the production sector are the final products of the consumption sector, and the final products of the production sector are the primary resources of the consumption sector.

[34] "Here are three productive services. When they refer to these factors, authors most frequently employ the terms land, labor, and capital. But these wordings are not sufficiently rigorous to serve as a basis for rational deductions. Labor is the service of personal abilities or service of persons; it is necessary, therefore, to place alongside it, not land and capital, but land services or the services of land, and capital goods services or the services of capital goods." (Walras, 2014, 192.)

of subjects, are not production factors. They become so only because of the production needs of a man who needs them to produce the final products. And since these needs are reproduced along with the reproduction of man himself, the production factors also are reproduced along with this needs.

5. In the consumption sector, thanks to the consumption of final products, there is a reproduction of the economic subject, its 1) physical and intellectual abilities; 2) ability to make economic decisions; 3) consumption and production needs; 4) right to ownership. Therefore, as a result of the consumption of final products, his needs and interests are not only satisfied but also reproduced along with the reproduction of himself. Thus, the entire economic process is set in motion by the energy generated by this process itself.

b) Sectors of the economy

1. Sectors of the economy comprise various branches that specialize in producing a particular good. And for this, they consume one or another set of other goods produced by other branches. Branches of the production sector produce goods consumed by the economic subject and his family members in the consumption sector. In the consumption sector, the economic subject and his family members are reproduced, resulting in the reproduction of labour and human capital.[35]

Each branch produces one particular kind of good while consuming various goods produced by other branches. Thus, it satisfies one of the subject's needs in the system of his needs. And the good produced in the branch is consumed in various other branches as one of the goods consumed by them. All branches are interconnected according to the network pattern and represent a closed system of transformation of certain goods into others following the production and consumption needs of the subject, which are the same unified system of interrelated needs. The satisfaction of each need depends on the satisfaction of other needs. Therefore, there are feedbacks between the production and consumption processes of various goods.

2. In reality, each unit of a good is produced once and, after consumption, forever disappears into oblivion. And the reproduction of a good means that another copy of the good of the *same kind* is produced, which also disappears forever after consumption. It is a one-way process directed from the past to the future. Therefore, the endless transformation of certain goods into others in the process of reproduction, *like a circular motion,* can only be an ideal process modeled in the human consciousness. In other words, we are discussing the endless reproduction of the same *kind* of good in the subject's representations. But *real* goods, as a specific copy of this kind, are produced only once and disappear forever as a result of consumption.

3. The reproduction of this or that *kind* of good implies the repetition of the same type of actions associated with the production of this kind of good and, accordingly, consumption of other kinds of goods. Thanks to the mental grouping of the same type of actions that

[35] This means the reproduction of knowledge, skills, and motivation in the new generation and their preparation for future economic activity.

transforms certain kinds of goods into others, the notion of the *branches* of the economy arises. Since each kind of good is produced through the consumption of other goods, all branches of the economy are interconnected and form the branch structure of a unified system of action. Indeed, it is a complex, nonlinear, operationally closed system of economic actions that is the *economy*.

2.3. Economic value

a) Needs

1. Objects the subject perceives as goods are not goods in themselves. They are such only *for* the subject and only because the subject has needs for those properties of objects that can satisfy his needs. Therefore, he perceives these properties as utility, and the objects that possess them - as goods. This means that economic goods only seem to the subject as something real and existing independently of him. But in reality, they are goods only in the subject's consciousness. Outside his consciousness, these are just natural objects and processes with specific physical, chemical and other properties and are subject to the actions of the universal laws of nature. The subject erroneously perceives the utility as a property of the objects themselves. Usually a person does not realize that by his needs he himself makes these objects useful and, accordingly, makes them goods.

2. In order to consume final goods and satisfy needs, the subject must first produce them. Therefore, besides the *need to consume* goods, the subject *needs to produce* them.[36] Accordingly, economic needs mean not only consumption needs but also production needs, which are the same inseparable unity of opposites as production and consumption themselves.

3. Economic needs are conscious needs, opportunities to satisfy which the subject possesses, and the satisfaction of which depends only on the decisions he takes. Without the presence of real opportunities to meet needs, they are only potential needs. For potential needs to be transformed into actual ones, which give rise to real incentives for economic activity, the subject must own the goods necessary to satisfy them. By producing final products from primary resources, the subject satisfies production needs. Thus, he creates real opportunities to meet consumption needs and, therefore, transfers them from a potential state to an actual one. But, as was shown, he reproduces production factors and, accordingly, primary resources by satisfying consumption needs. Thus, he creates real opportunities for satisfying production needs and, consequently, also transforms them from a potential state to an actual one.

Summarizing, we can say that some needs are reproduced as a result of the satisfaction of other needs. Since every good is both a product and a resource, then as a product it is the *result* of satisfying a need, and as a resource, it is a *means* of transforming potential needs

[36] This means that he also needs to realize his abilities (physical, intellectual, and spiritual), that is, to "consume" himself as the main resource, without which no goods can be produced.

into actual ones.[37] Thus, the very satisfaction of needs generates new needs, and, accordingly, the incentives necessary to continue the economic process.

b) Utilities and costs

1. The needs underlying purposeful activity are conscious needs and exist as representations, ideas, and knowledge that 1) a reality does not correspond to his interests, and 2) there is a real opportunity to change it in the desired direction. Since needs exist in consciousness as representations, the subject can abstract from their specific content and present them as *abstract needs*, needs in general. Specific needs *qualitatively* differ from each other, and are therefore *quantitatively* incommensurable, i.e. incomparable as different *magnitudes*. But as *abstract needs*, all needs are qualitatively homogeneous, and as such, they differ only in magnitude and are, therefore *commensurable*.

Similarly, all goods'specific utility is *qualitatively* different from each other and, therefore, *quantitatively* incommensurable. But since utility is the subject's mental representation of the properties of objects that can satisfy his needs, he can abstract from the specific properties of objects and mentally single out only one of their properties - *the ability to satisfy the need in general*. As *abstract utilities*, the utilities of various goods are qualitatively homogeneous and differ only in magnitude. In this form, they become quantitatively commensurable.

Thus, with the help of commensuration of *abstract needs*, it becomes possible to identify the *relative magnitudes* of various *specific needs* that are directly incommensurable. Also, with the help of commensuration of *abstract utilities*, it becomes possible to identify the *relative magnitudes* of various *specific utilities*, i.e., measures of their ability to satisfy abstract needs.

2. In the production process, the utility of the goods consumed *destroys* along with these goods, and a new utility of the goods produced *appears*. The destroyed utilities, which are sacrificed for the sake of creating new utility, the subject perceives as *costs*. He cannot perceive them otherwise, because, along with the destruction of consumed goods, the possibilities of using them to satisfy alternative needs are also destroyed. As *direct costs*, are perceived utilities of actually consumed resources is perceived, and as *indirect costs* are perceived utilities of alternative products, the possibility to produce of which is lost forever. Costs are past utilities, or "memory" of utilities associated with the sacrificed goods and the lost opportunities to meet alternative needs.

As a result of the consumption of goods, unsatisfied needs are transformed into satisfied ones. Accordingly, resources are converted into products and the *utility* of resources into *costs* embodied in products. Unsatisfied needs are related to resources, while satisfied needs are related to products. If the utility of resources confronts *unsatisfied* needs at the beginning of production, then, as a result of consumption, needs are *satisfied*, and they are

[37] As for potential needs, they do not give rise to real incentives for action, because they contain not so much a volitional component as an intellectual one. The formation of potential needs is the awareness of their interests and the formation of priorities for making economic decisions.

confronted by the *costs* embodied in products. If the consumption of resources has not resulted in the satisfaction of the need and getting the desired products, in other words, if the utility of the resources used did not turn into *useful costs*, then it means that they turned into *useless costs*, i.e. into *losses*.

3. The magnitude of the *cost* of producing a product unit depends on the utility of the resources sacrificed (consumed) in its production. But the *utility* of this product unit does not depend on the cost of its production and, therefore, does not depend on the utility of the resources consumed in its production. The *utility* of each unit of this product depends on the ratio of the *number* of products produced and the *need* for them.

Since abstract utilities are qualitatively homogeneous in all goods, be they products or resources, and differ only in magnitude, then in the process of resource consumption and product production, the abstract utilities that are *destroyed* and *created* can be equal or differ in magnitude.[38] Production *efficiency* depends on the ratio of these magnitudes and, consequently, on the ratio of costs and results.

4. Thus, *utilities*, *costs*, and *losses* are the subject's teleological relation to objects through the prism of his *needs*. These concepts are closely interrelated and do not make sense without each other. Based on them, a system of the subject's attitudes to various objects is formed, thanks to which he can purposefully influence the existing reality and control the process of its change in the desired direction.

c) Economic values and valuations

1. In the same way that resources embody *utility*, all products embody *costs*. But since every good is both a product and a resource, each good embodies both utility and costs. This unity of utility and cost is *economic value*. The subject, as a consumer perceives the value of consumed resources from the perspective of their utility, and the value of the produced products - from the perspective of production costs. And in the process of goal-setting, making economic decisions on the production of certain products by certain resources depends on the ratio of the expected value of the products produced and the total value of the resources required for their production. In other words, this means that the decision depends on the ratio of the expected utility of future products and the costs required for their production.

2. However, the subject cannot perceive the magnitude of values otherwise than through the *ratio* between different values, as a *relative* magnitude. The subject perceives values only when he chooses between various goods and compares their values with each other. The values of various goods, like abstract utilities and abstract costs, of which they are the unity, do not differ qualitatively from each other; they are qualitatively homogeneous. They differ only in magnitude. But like any other magnitude in general, the magnitude of

[38] By the way, precisely with this circumstance that the risk of losses is associated, that is, the risk that useful resources may be used, but products may not be obtained, or obtained in a smaller quantity, or not of the same quality as planned when comparing costs and results, and on the basis of which the decision was made.

value cannot be perceived in isolation from other magnitudes. Accordingly, it cannot be perceived without comparing it with the values of other goods.

Various values may be larger, smaller, or equal to each other. Such a comparison may be a direct *commensuration* of different magnitudes, or a *measurement* if there is a unit of measurement through which all other magnitudes are expressed.[39] The result of such a *commensuration* of the values of various goods is their *valuation*. They are *indicators* of the ratio between different values. Therefore, the subject is aware of the values only during the choice between various goods, i.e., when he compares their values with one another. Valuations appear as a result of such comparisons.

3. In a subsistence economy, there is no unit of measurement of values. The economic valuations of various goods here are as relative as their values. Some are greater, and others are less or equal to each other. Both values and valuations, in which values are manifested, are systemic magnitudes and acquire meaning only in the context of the entire system of value relations between goods. Thus, along with the *value system*, a *system of valuations* emerges, which is derived from it. In addition, in a subsistence economy, economic values are *subjective*, so the results of their commensuration appear in the form *of subjective valuations*. Valuations are the form in which values show up in consciousness, allowing the subject to commensurate costs and results and make economic decisions.

4. Since goods are produced by goods, the valuations of goods depend on each other in the same way as the values of goods depend on each other. The external environment and current conditions affect the valuation of goods in each particular case. These are, a sort of, *opportunistic* valuations. They are changeable and can fluctuate within certain limits relative to more fundamental and stable valuations, which directly reflect the ratio of economic values (which are also more stable over time) and serve as attractors for the *opportunistic* valuations. In addition, although the system of valuations is formed based on the value system and reflects it, however, these systems do *not intersect* anywhere. These systems are closed in themselves and exist, as it were, parallel to each other. Both are autonomous self-referential systems existing in a subjective frame of reference.

5. As noted, goods are produced by goods and, therefore, they simultaneously are both produced products and consumed resources. As a result of production, the utility of resources is transformed into costs embodied in products. But products are deliberately produced as useful resources for producing other products. Clearly, the decision to produce a given good by consuming a certain set of other goods will be made by the subject only if the utility of the produced good is greater than the total utility of the goods sacrificed for its production (i.e., if the utility of the produced good is greater than the costs embodied in it). In other words, products are produced only if the product's value is greater than the total value of the spent resources, that is if the *surplus value* of the product is created.

At the same time, the values of the spent resources are *not transferred* to the product, to which surplus value would be added further. No. The values of resources are destroyed

[39] Historically, before the unit of measurement, a man determined the magnitudes of different objects only by identifying the differences between them through direct commensuration. The accurate measurement appears only after the appearance of the unit of measurement. But an accurate measurement is only a more advanced form of commensuration, in which the magnitude of the measured objects and the magnitude of the object taken as the unit of measurement are directly commensurated.

together with the resources themselves when they are consumed, leaving only a "memory of oneself". Product value is a newly created value. It is created together with the product and is greater than the total value of the spent resources by the amount of surplus value.

6. It was also shown above that the production of goods is associated with the risk that resources may be spent, but, for one reason or another, the product may not be produced. Therefore, making economic decisions is associated with *entrepreneurial risk* and therefore, requires spiritual and strong-willed efforts, i.e. subjective costs. That means that when making a decision, the subject commensurate not only the total value of spent resources with the value of the product being produced. He also compares the magnitude of surplus value with the magnitude of entrepreneurial risk and subjective costs associated with it. Entrepreneurial risk must be justified by the magnitude of the expected surplus value. Clearly, production is not advisable at high risk and low expected surplus value. It follows from the above that the *total cost* of producing goods comprises *objective* and *subjective* costs, that is, the total utility of sacrificed resources and spiritual-will efforts, spiritual energy associated with entrepreneurial risk. Accordingly, in equilibrium, value is the unity of a good's *utility* and its production's *total cost*. At the same time, the share of surplus value in the value of various goods may be higher or lower. Still, in any case, from the subject's point of view it should be an acceptable compensation for the risk associated with producing the relevant good.

In order to replace periodically depreciated capital goods with new ones, the subject must make *savings* of resources and invest them in the production of capital goods. Since in the production of products there are risks of loss of resources, the subject is forced to *insure* these risks. Also, for this purpose, the subject must make savings of resources. But to make savings, spiritual-will efforts are also necessary, but they are no longer associated with risk but with *abstinence*.

7. As a result of consumption, *needs* are satisfied, *resources* are transformed into *products*, and the *utility* of resources is transformed into *costs* embodied in products. However, the product was deliberately created as a useful resource to satisfy other, then still potential, needs. With the emergence of a product as a new useful resource, a certain set of needs that were potential before the appearance of this product (new resource) is converted into a set of actual needs. Now it depends only on the subject's will which of these alternative needs he will satisfy with the help of this new resource. Satisfying a need is perceived as eliminating dissatisfaction and getting the desired product as a new useful resource. Naturally, its utility is perceived as something positive, bringing happiness, and is subject to *maximization*. And the costs, on the contrary, are subject to *minimization* since they are associated with the destruction of utilities.

8. Following the same logic, since some goods are sacrificed to others in the production process, the values of goods consumed and goods produced have opposite signs. For the costs of producing a good are formed from the utilities of the goods consumed in its production. The value of a product and the values of the resources from which it is produced relate to each other as *positive* and *negative*. They mutually exclude each other, although they exist only thanks to the other side. Each of them is something negative, not in itself, but only *in relation* to the other side, which is perceived positively. And since every good is at the same time a product produced from resources, and is itself a new resource from which other

products will be produced, then the value of this good is a contradictory unity of polar opposites in sign a) the cost of its production and b) its utility to produce other goods. Accordingly, the value of this good as a *product* (embodying the cost of valuable resources) has a *negative sign*, and its value as a *resource* (useful for the production of other goods) has a *positive sign*.

9. As shown above, the economy comprises a production sector and a consumption sector, which produce goods for each other with the help of the goods they receive *from* each other. From a purely operational point of view, if we abstract from causal relations, this is a closed system of economic actions and the interaction between its sectors takes on the character of a *feedback loop*. Each sector produces for the other side *all* the goods that it (the other side) needs to produce *all* the goods that the first side needs. These sectors need nothing else. Therefore, the subsistence economy, being composed of two interacting sectors, economically depends only on itself. But its dependence on itself is precisely its independence from others and its self-sufficiency.

10. Since primary resources and final products are goods that are produced in one sector and consumed in another, the values of these goods are associated with costs for one sector and utility for another. Accordingly, they have a negative sign for one sector and a positive sign for another. Primary resources and final products endlessly reproduce each other, sacrificing themselves in the process. Accordingly, the values of these goods endlessly reproduce each other in the same way.

In the context of economic activity as a whole, this endless process of reproducing values by destroying them reflects the same endless process of generating some of the subject's needs as a result of the satisfaction of others. Thanks to this, the economic value system makes coordination between all economic actions possible. The value is a system magnitude. They link all economic actions into a single closed self-referential dynamic system.

11. Given the nature of the interaction between sectors, it is clear that the cost of producing goods in each sector is formed from the utilities of goods produced in the opposite sector. The utility of the goods consumed is converted into *costs* that each sector seeks to *minimize*. And at the same time, each side seeks to *maximize* (for the other side) *the utility* produced by these costs so that the other side can produce more useful goods for itself. That is, both sectors (and the economy as a whole) maximize the utility of the goods produced and minimize the costs of their production and, therefore, strive for efficiency in production and consumption.

12. The value of goods is a contradictory unity of utility and costs, which have opposite signs. They are inseparable, like the poles of a magnet.[40] At the same time, the subject has a positive attitude to the utility of goods, but a negative one towards the costs of producing goods. Therefore, the subject’s value attitude to the goods themselves is contradictory. The result of the such an attitude towards goods is economical consumption and a thrifty attitude towards them. It gives rise to the desire to simultaneously consume goods and refrain from consuming them (i.e., to save). The desire to satisfy reasonable, necessary needs is

[40] They mutually repel each other but cannot separate. Just as if a magnet is broken in half, we get not a separate positive and a separate negative pole but two small magnets, each of which has both poles.

complemented by the desire to refrain from satisfying irrational needs, excesses, and random whims. Violation of this balance between satisfaction and abstinence leads to vices - either to excessive consumerism or to senseless asceticism and miserliness.[41]

2.4. Optimality

1. The subject's economic needs consist of consumption and production needs, two subsystems of a single system of needs. As indicated, as a result of meeting the needs of each of these subsystems, create ***products*** that are ***resources*** for the other. At the same time, the needs have a certain magnitude. The magnitude of every single need is conditioned by its *solvency*, which implies the maximum amount of goods that the subject, if desired, can allocate to fully satisfy it.[42] According to the same logic, the solvency of the entire system of economic needs over a certain period is due to the totality of economic goods available to the subject in the same period.

Since goods are produced by consuming goods, the scarcity of resources gives rise to the scarcity of products, which are themselves scarce resources for producing of other scarce products, etc. That is, the scarcity of some goods gives rise to the scarcity of others, and together they mutually condition the degree of scarcity of each other.

2. Since the subject must satisfy all his needs with all available goods, it is clear that he cannot allocate the *maximum possible* number of goods for every single need to fully satisfy it. If he allocates more goods for some needs, then for others, he will have to allocate less. In other words, it is impossible to *fully* satisfy *all* solvent needs in the specified period, although such an opportunity exists for one or another separately taken need. Therefore, the problem of choice and decision-making arises - how to distribute the goods for the maximum possible satisfaction, not of one or another separately taken needs but of the entire set of needs as a whole.

3. Each type of good is produced in one branch and consumed in others; it represents a product of one branch and a resource for other branches. As a product, a good embodies the *costs* of production (including subjective costs) carried out in the branch that produces it, and as a resource, it embodies *utility* for the branches that consume it. But since an economy is a closed system in which all goods are produced through the consuming goods, then only such allocation of resources can be optimal, in which an equal magnitude of their costs for the production of goods [43] would account for an equal magnitude of the utility of goods produced from them, i.e. the *even-utility of costs* in the system.

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[41] Thriftness should not be confused with miserliness. Unlike the miserly, the thrifty does not consume only what he does not need, but what he does need, he consumes.

[42] Beyond its ability to pay, i.e.б if the subject does not possess the necessary goods at all, or if the goods are not limited and, therefore, their consumption is not perceived as a "payment" for satisfying a need, the needs cease to be economic needs.

[43] It means that one of the goods produced is the life of the subject and his reproducible abilities and spiritually-volitional energy necessary for producing all goods. And production costs mean total costs, including subjective spiritual-will energy costs associated with risk and abstinence.

4. Costs are extensive quantity, and utility is intensive quantity. Extensive quantities are subject to the law of additivity, and intense quantities are not subject to it.[44] For example, just like weight or length, costs can be summed up and the total cost of producing a good or set of different goods obtained. The magnitude of total cost is linearly dependent on the individual cost components of which it is composed. But the utility of goods is impossible to sum up. Since utility is an intensive magnitude, the utility of a stock or set of goods is not the sum of the utilities of the individual goods of which they consist. They have a non-linear relationship.

Both the cost of their production and their utility depend on the quantity of goods produced. But, along with a change in the quantity of goods, the production cost of each unit does not change, while the utility of each unit does. At the same time, as a result of a change in the quantity of goods, costs and utility change in opposite directions. Costs vary extensively and linearly with quantity, while utility varies intensively and non-linearly in the opposite direction. This means that with a given system of needs, there can be such a structure of production and consumption of goods in which all goods are produced and consumed in such an amount that the utility of goods is equal to the costs of producing the goods.

5. As we see, the *utility* of goods, and the *costs* of producing each of them, directly depend on the *quantities* of goods produced and consumed. But these quantities depend on the subject's will, i.e., on the distribution of goods according to his needs. In such a circular dependence of *utilities*, *costs*, and *quantities* on each other, the subject's desire to obtain maximum utility with minimum costs gives rise to a tendency to achieve *even-utility of costs* for the production of all goods. Due to this, the system tends to form a dynamic equilibrium of the system, in which the created value of each produced good is equal to the total value of the goods consumed in its production process. This tendency towards intra-system balance is due to feedback and the circular organization of the economic system.

However, in what specific goods and precisely in what quantities economic values are embodied – depends on the distribution of goods for consumption, production, and satisfaction of needs. It also depends on the external environment of the economic system (available technologies, natural conditions, social norms, consumer preferences, etc.). This circumstance is due to the fact that the economy, although there is an operationally closed system, but at the same time it is a causally open system and is in a causal relationship with the external environment.

6. If the utility of a good exceeds the cost of its production, then it is *deficient*, and if the cost of production exceeds its utility, it is an *excess*. In other words, the utility of a deficient product is *greater* than the total utility of the resources spent on its production, and the utility of an excess product is *less* than the total utility of the resources spent on its production. Deficiencies and excesses are mutually conditioned and indicate a suboptimal allocation of resources. In short, the optimal is an equilibrium state, in which, *in the system as*

[44] For example, if we add another one liter of water to one liter of water, we get two liters of water. But if we add one liter of water with a temperature of 7^0C to one liter of water with a temperature of 5^0C, then we will not get two liters of water with a temperature of 12^0C. Volume is an example of an extensive magnitude. Volumes can be summed up. Temperature is an example of an intensive magnitude quantity. Different temperatures cannot be summarized.

a whole, the utility of the goods produced is equal to the utility of the goods consumed, and the utility *of each good* is equal to the full (objective and subjective) costs of its production.

7. If, as a result of the consumption of a certain good, its utility has been transformed not into useful costs, but into losses, then the deficiency of the remaining stock of these goods will increase relative to the need for it. Due to the increasing deficiency of these goods, there will be revaluation, and the value of the remaining stock will increase. If an excessive quantity of goods is produced, then there is a revaluation and depreciation of the increased stock of these goods. Moreover, the occurrence of deficits and the occurrence of excesses are interrelated. They result from either inefficient *consumption* of resources or their inefficient *allocation*. In both cases, if a deficit of some goods occurs, there will be an excess of some other goods. Deficiencies and excesses are a consequence of the fact that part of the resources is used to produce excess products, and they are no longer enough to produce deficient products. Conversely, if there are deficient products, then not enough resources have been used to produce them. In this case, either the under-used part of the resources becomes excess, or those products that they additionally produced. In either case, the values of goods can increase or decrease as a result of the appearance of deficits and excesses caused by overproduction or underproduction of individual goods. But since the appearance of deficits and excesses are interconnected, the increase and decrease in the values of various goods balance each other, and the total value of all goods remains unchanged.

8. The utility of a particular good depends on its quantity in the existing stock. And its quantity in stock at any given moment depends on the ratio of the rate of production and the rate of consumption of this good. In other words, their deficiency is changeable, constantly varying depending on their production and consumption intensity. The optimization of economic activity occurs by producing more deficient goods from less deficient (or relatively excess) goods. It is expressed in the fact that in the process of permanent satisfaction and the birth of needs, priority is given to the satisfaction of more intense needs, after which they give way to other needs that were less intense. And for this, of all the available technologies, such technologies (in the production sector) and consumer bundles (in the consumption sector) are used using relatively abundant and less deficient goods. The general course of this process is aimed at equalizing the deficit of goods in all branches, hence leading to the *even-utility of costs*. Thus, it supports the desire for a dynamic equilibrium between production and consumption in line with the needs structure.

2.5. Total value

1. The world of economic values has no actual being and is directly inaccessible to observation from the outside. It exists only in the subject's consciousness as a mental *process* that connects the values of present, past and future goods in an inseparable time-stream and organizes his economic actions according to his needs. At the same time, depending on the productivity of economic processes over a certain period of time, only the *quantity* of goods produced and consumed can increase and decrease, but not their total value.

2. The totality of all goods (including intermediate products and resources) is formed from two opposite totalities of goods - primary resources and final products. Since both of these totalities reproduce each other endlessly, the primary resources and final products taken separately, in a more general sense, are simultaneously primary resources and final products in relation to each other. This process of mutual reproduction of the two totalities mentioned is accompanied by the same endless mutual reproduction of their total values. Accordingly, the totality of unsatisfied (production and consumption) needs is transformed into a totality of satisfied needs, again giving rise to unsatisfied needs, etc.

3. The total value of all economic goods is a single whole, consisting of variable and different in size values of individual goods, as their parts. But despite the variability of its constituent parts, the magnitude of the total value of goods, however, does not change. For, since goods are produced by the consumption of goods, the creation of the values of some goods is associated with the destruction of others, just as the satisfaction of some needs is associated with the birth of new ones.

Goods are created by goods, and their values by values. Accordingly, the total values of primary resources and the total values of final products are sacrificed when they reproduce each other. It follows that these two totalities of economic values are *equal* to each other and *opposite* in sign. And the total value of *all* goods, which integrates both of the totalities mentioned above, exists in the form of a *process* of self-generation and self-destruction. It is a process of *self-reference*, in which the total value of all economic goods is related only to itself and, as such, is a closed process of reproduction of some economic values by destroying others.

Although the values of individual goods have their own magnitude, these are only *relative* magnitudes - some more, others less. Therefore, the total value of *all* goods does not have an absolute magnitude. What is true for the total value of economic goods is also true for total utility and total costs. We can think of all these totalities not as definite magnitudes but only in categories of the *whole* and its *parts*.

Therefore, the magnitude of the total value, total utility, or total costs, which are integrities, do not depend on the subject's activity. Only the rational allocation of the goods themselves (for their consumption and reproduction) depends on his will by calculating their values. The process results in the allocation of the total value of goods.

4. Similar reasoning is also valid for economic needs, which are reflected in economic values. Each new actual economic need can arise only as a result of the satisfaction of some other economic needs. The totality of economic needs can be thought of not as a specific magnitude but as a *whole*, consisting of various needs, greater or lesser relative to each other. As abstract needs, economic needs for certain specific goods are qualitatively homogeneous and differ only in their *relative magnitude*, measured by the magnitude of economic values sacrificed to satisfy them. But the totality of economic needs can neither increase nor decrease, and is always associated with wholeness in the same way as the totality of values, utilities, and costs.

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Subsistence economy is characterized by a number of features that determine the principles of managing the economy, allocating resources, optimizing production and consumption, and so on. These features determine the methods of making economic decisions. In the subsistence economy: 1) a limited set of products was produced, necessary for a minimum standard of living; 2) there was a connection, perceived by the subject, between the production and consumption of all goods; 3) a more or less stable set of products was produced, and there was a stability of sectoral proportions that were reproduced from generation to generation and hardly changed over long periods of time.

In such circumstances, the subject had little choice of alternative solutions. He was aware of all his needs, as well as the opportunities for their satisfaction, that is, he knew directly - *What? How?* and For *whom?* to produce. Therefore, economic decisions-making was based mainly on *natural indicators*. And economic values and valuations contributed to decision-making and the subject, whenever possible, followed a simple rule - to produce more deficient goods by consuming less deficient goods. However, economic values will play a dominant role in a market economy when making decisions and optimizing the economic activity of society as a collective subject.

The subject strives for the optimal allocation of resources, but never achieves them because of many objective and subjective factors - natural conditions, unforeseen circumstances, lack of knowledge, etc. Therefore, as a rule, deficits and excesses arise in the subsistence economy of each individual. This gives rise to incentives for the interaction of economic subjects, in which the parties exchange excesses of their products, which are deficient resources – for the other side. This contributes to the optimization of the economic activity of each of them.

Section 3.
Market economy

3.1. System of economic actions

1. Economy is a system of economic actions.[45] But in a subsistence economy, these are *individual actions*, while in a market economy, they are *social actions*. In a subsistence economy, everything that the subject produces, he himself consumes. Products produced as a result of some actions of the subject serve as resources for consumption in other actions of the *same* subject. But in a market economy, everyone produces goods for each other and exchanges them. Products produced by the actions of *some* subjects serve as resources for the actions of *other* subjects. All of them are bound by their actions. As a result, a closed network of social actions of society as a collective subject emerges.

Only a part of the *individual actions* of subjects of the subsistence economy is transformed into *social actions*. Because of the division of labor, they are built into a unified network of social actions. These social actions precisely form the market economy as a complex self-regulating system of actions. It builds on the individual actions of private subjects, thereby transforming the former subsistence economies into its subsystems and subordinating them to its own laws of functioning. Accordingly, the economy of each individual subject appears as a single system comprising two subsystems of economic actions - individual and social, coordinated by his mind and will.

Economic processes that were previously modeled an individual subject's consciousness are now being implemented in the social space in the form of economic interactions between subjects. But these processes are already being modeled in the collective consciousness of society. Along with the similarity of these mental constructs in the individual and social consciousness, there are also specific differences. This is exactly the specificity that should be explored in more detail.

2. Subjects bring to market only those products that can be exchanged for other products. And since the same types of goods for exchange are produced by many actors that together form a separate branch, it is clear that in a closed market system, only such a branch

[45] In this concept, the economy is presented as a system, the primary element of which is economic action. According to this understanding, economic subjects themselves are also represented as systems of economic actions performing various functions. Therefore, hereafter, speaking of producers, consumers, entrepreneurs, savers, investors, etc., we will mean not the subjects performing these functions but the totality of the actions themselves performed by them to carry out these functions.

can arise, whose products are needed by other branches. Each branch produces products that other branches consume as resources. This is how a system of interconnected branches is formed, which are parts of a market economy as a single whole.

In the absence of any regulatory center, the market exchange of goods itself must contain a mechanism for regulating sectoral proportions. For none of the market agents knows either the magnitude of the solvent needs for his product by other branches or the volume of production of this product in his branch. Accordingly, no one knows what the market demand and supply ratio will be; no one knows whether the exchange market price for his product will be sufficient to exchange it profitably for the resources he needs.

3. All owners of production factors (Labor force, Land, Capital, and Entrepreneurship) are consumers of final products. They form the consumption sector. But also, they all contribute to producing of final products in the production sector in the form of services of their production factors. In the market of primary resources, entrepreneurs buy from the owners the right to temporarily use the services of production factors – Labor force, Land and Capital. Payment for the right to use their services is Wage and Rent.[46] With the help of the services of these production factors, entrepreneurs produce final products, which they, together with the entrepreneurial services embodied in products, sell to the owners[47] of the factors in the market of final products.[48] Thus, all owners of production factors are buyers of products. All economic subjects are involved in the production of products that they themselves consume.

4. It is necessary to distinguish production as a *technological process* (transforming some *natural objects* into others), from the *economic process* (transforming some *economic goods* into others). To perform the entrepreneurial function, the producer does not need ownership of production factors themselves. He needs only the *services* of these factors. But it is possible to buy these services from the owners of production factors only in the form of purchasing the *right to* temporarily *use* the services of these factors.[49] For the owners themselves do not sell the production factors as long as they wish to keep them as a source of permanent income.

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[46] Along with the Wage and Rent, we do not indicate the Interest, since the Interest is a payment for the right to use Money Capital. But the factor of production is not monetary, but physical capital. At the same time, the payment for the right to use the services of Physical Capital, as well as the services of the Land, is Rent. As for Interest, according to this concept, it is paid from Profit and Savings. That is, money capital, is formed by the redistribution of money incomes and is itself *a factor of redistribution*, but not *a factor of production*.

[47] The entrepreneurs themselves buy final products from each other in the same way that all other owners buy these products from them.

[48] The purchase and sale of final products differ from the purchase and sale of primary resources only in that, in the first case, the *right to ownership* of the products is sold and bought, and in the second case, the *right to use* services. For, in the final analysis, the purchase and sale is nothing but an exchange of *rights* between the seller and the buyer.

[49] It should be emphasized that from the point of view of structural-functional analysis, the functions of economic *actions*, and not of economic *subjects*, are considered here. Subjects can simultaneously perform different actions and, accordingly, different functions. In economic reality, producers often combine the functions of an entrepreneur and the owner of various production factors. The Entrepreneur can simultaneously be the Capital owner, Land owner and perform the Labor Force functions. In this case, it is assumed that he not only receives Profit for entrepreneurial services, but also pays himself a Wage, or Rent for the right to use the services of his production factors.

Factor services are primary resources only in a technological sense, but from a purely economic point of view, the primary resources for entrepreneurs are not factor services, but the rights to use them. It turns out that the reproduction of primary resources is reduced to the reproduction of ownership of the production factors. It is the *ownership right* that provides owners with the opportunity to sell the *rights to use* the services of these factors. But only living people - owners - can have rights in any form. Therefore, the reproduction of rights is reduced to the reproduction of the owners' lives and, consequently, to their consumption of final products. Thus, the circle is closed. Final products are produced from primary resources, and primary resources are reproduced by consuming final products.[50]

3.2. Branch structure

1. In a market economy (like a subsistence economy) there is a *production sector* and a *consumption sector*. In the production sector, subjects (entrepreneurs) produce final products and consume primary resources.[51] And in the consumption sector, on the contrary, the subjects (owners) consume final products and reproduce primary resources.[52] These sectors are interconnected through the markets for final products and for primary resources. They exchange their products, which are resources for the other side. If the markets for final products and primary resources are presented as a single market, then ultimately, it turns out that primary resources and final products are exchanged with each other.[53] But in a money economy, the exchange of commodities is mediated by exchanging commodities for money.

[50] In the economic literature, not the *services* of the Land (as production factor) are often indicated as primary economic resources, but non-renewable natural resources that are reproduced by nature and not by man (oil, gas, ore, standing wood, etc.). However, oil or ore, while they are in the ground, or trees in the forest, cannot directly serve as resources for the production process. In order to be able to use them as resources, they must first be removed from the earth's bowels, cut down in the forest, etc. But in this case, they already become products, i.e., *intermediate* resources rather than *primary* resources. As mentioned earlier, the difference between them is that primary resources are reproduced in the consumption sector and consumed in the production sector, while intermediate resources (products) are produced and consumed in the production sector itself. Thus, before withdrawal, non-renewable natural resources are not economic resources suitable for production at all, and after withdrawal they become intermediate resources (products). But in order to extract ore from the earth or cut down trees in the forest, it is necessary to have the right to do so. Although Nature provides an agent with the opportunity to use its benefits and thereby provides him with services, in the legal environment in which the institution of private property exists, it is also necessary to have the right to use these services. In other words, in order to be able to use the opportunities provided by Nature, the entrepreneur also needs the opportunities provided by society, which is the right to use the services of production factors. It is these *rights to use* that the entrepreneur buys from the owners of the production factors, including from the owners of the Land.

[51] As already noted, all economic entities simultaneously consume and produce goods. Therefore, they are both producers and consumers at the same time. However, to avoid confusion of terms, we will call the subjects of the production sector (entrepreneurs) *Producers*, and the subjects of the consumption sector - *Consumers*. (Moreover, entrepreneurs who are Producers in the production sector are also Consumers in the consumption sector.).

[52] In this sense, the products of the production sector are resources for the consumption sector, and the products of the consumption sector are the resources for the production sector.

[53] In this whole process, we do not consider intermediate products and intermediate production separately because, ultimately, the value of all final products can be reduced to the value of primary resources. For, the total value of final products is equal to the total value of primary resources.

And instead of a single barter market, we have two separate markets interconnected by money flows.

In modern conditions, the production sector is represented by firms that produce products, and the consumption sector is represented by households that reproduce primary resources. Firms producing homogeneous products form branches of the production sector. The final products produced in this sector are consumer products and physical capital. And households that reproduce ownership of homogeneous production factors and sell their services form branches of the consumption sector. Primary resources and human capital are reproduced in this sector.

2. If each branch specializes in the production of one commodity and produces them for other branches, and for its own production consumes commodities produced by other branches, then the branches become organically connected with each other through market exchange. Altogether, they form the market economy as an operationally closed system of economic actions.

An emergent property of a market economy is such a relationship between its branches, in which *each branch produces commodities according to the needs of all other branches*. This systemic property acts as the organizing principle of economic processes, aimed at maintaining the integrity of the economic system and necessary for forming the optimal branch structure of the economy. The emergent property of a competitive economy naturally arises from the division of labor and specialization. Due to this property, the economy tends to a state of dynamic equilibrium in which the functioning occurs in an optimal mode.

3. It becomes possible to discover the emergent property of a market economy only after the economy is understood as a unified system of economic actions. This makes it possible to detect an *essential relation* in the economic system, and to present it as a *whole, consisting of parts*.[54] The essential relation serves as the basis for understanding how the feedback system, optimal market prices, and the mechanism of self-regulation are formed in a market economy.[55]

Thus, the connection between production and consumption "is realized in the form of that reflection through which the whole mediates its parts. Moreover, the mediation here has a complete character - a single production-consumption process has all the parts it assumes, is

[54] According to this understanding, "... the multitude is recognized as contained in the unity, i.e., it is recognized as its parts, and the unity is considered as a whole. The essential relation is thus in the form of the relation of the whole and the parts. This relationship is essential: neither side can be conceivable without the other, there is no whole without parts and no parts without the whole. Each side presupposes the other, the whole presupposes the parts, and vice versa." (Fischer, 1902, 523-524.)

[55] "In this sense, the whole (wholeness) is the unity of the necessary parts on the basis of the realization of their essential relationship. .... Each of them is defined through the other. .... The leading factors here are mutual conditioning, essential connection with each other, ... As a result, this reflection ensures the certainty and stability of both the whole and all its parts. Here reflection is embodied in a concrete essential relation. ... Obviously, the essential relation of the whole is system-forming. We emphasize that not every system is a whole, since its elements and parts are not always necessary, that is, not always optimal. Removing some part may not disturb anything." (Yatskevich, 1990, 66 – 67). "The classic example is a pile of sand; the relation $\mathbf{x} \in \mathbf{A}$ here is purely formal; it makes no sense to talk about any kind of optimality. The grains of sand are only indifferent to each other and are not connected by essential relationships." (Ibid., 67) "....All these provisions are in good agreement with the fact widely known in cybernetics - if there is no closure, then the dynamic process loses stability. The considered case is extreme, but it convincingly shows that the weakening of reflection reduces the efficiency of the entire production. If there is no closure, then there is no certainty, and therefore there is no optimality."

closed and, therefore, optimal in a broad sense. Within the framework of this abstract moment, ... the law of symmetry is fulfilled - that and only that is produced that is consumed, and only that which is produced is consumed." (Yaskiewicz, 1990, 83).[56] Theoretically, the emergent property of an economy based on the division of labor ensures the achievement of dynamic equilibrium and the mode of optimal functioning. But in practice, under conditions of decentralization, the emergent property is realized only as a tendency towards equilibrium. In fact, equilibrium is not achieved due to the spontaneous nature of market processes and the destabilizing effects of the external (natural and social) environment.[57]

4. In general, the economy appears as a system in which the "production of commodities by means of commodities" (P. Sraffa) takes place. It comprises many branches, each of which consumes commodities produced by other branches. "… in a state of equilibrium, an increase of production in any one branch is impossible without a reduction of production in some other branch. Any change leads to an imbalance of the system. In conditions when all branches produce goods for each other, the interaction between branches takes the form of commodity exchange. But the branch can sell only what it produces itself, and - buy only what other branches produce. In conditions of equilibrium, each branch produces goods exactly in the volume that fully satisfies the solvent needs of all other branches. And since the solvency of the needs of each branch is determined by the very volume of its production, it is clear that in conditions of equilibrium, with the given system of social needs, there is a single system of exchange ratios that provides a complete clearing of all markets. From this it follows naturally that in the presence of competition there is a unique equilibrium of system. Further, it will be shown that this equilibrium is stable, because its violation gives rise to economic forces that restore equilibrium. .... In the final analysis, it all comes down to the fact that each branch pays for consumed goods by produced goods. But supply and demand only contribute to matching the rhythms of production and consumption." (Leiashvily, 2021, 7-8.) [58] For, these rhythms do not coincide in time. For example, wheat is harvested once or twice a year, but bread is consumed daily in society. On the contrary, there are goods whose consumption is seasonal, or capital goods consumed over many years but

[56] "....All these provisions agree with the fact widely known in cybernetics - if there is no closure, then the dynamic process loses stability. The considered case is extreme, but it convincingly shows that the weakening of reflection reduces the efficiency of the entire production. If there is no closure, then there is no certainty, and therefore there is no optimality." (Ibid., 83-84)

[57] "Closedness and certainty (of a biological species, a production process, a specific language of communication) are essentially the same thing. The inconsistency of development lies in the fact that each of these systems each time redefines itself and its parts, but in this movement, it removes certainty since it reveals something that belongs to it only in perspective, but not yet related to the whole. Therefore, optimality is necessary. . . and determining factor. Any open system strives for it, but in this striving bypasses it, ensuring the unlimitedness of the evolutionary process." (Yatskevich, 1990, 85-86)

[58] "When goods are carried to market what is wanted is somebody to buy. But to buy, one must have wherewithal to pay. It is obviously therefore the collective means of payment which exist in the whole nation that constitute the entire market of the nation. But wherein consist the collective means of payment of the whole nation? Do they not consist in its annual produce, in the annual revenue of the general mass of its inhabitants? But if a nation's power of purchasing is exactly measured by its annual produce, as it undoubtedly is; the more you increase the annual produce, the more by that very act you extend the national market, the power of purchasing and the actual purchases of the nation. … Thus it appears that the demand of a nation is always equal to the produce of a nation. This indeed must be so; for what is the demand of a nation? The demand of a nation is exactly its power of purchasing. But what is its power of purchasing? The extent undoubtedly of its annual produce. The extent of its demand therefore and the extent of its supply are always exactly commensurate." (Mill, 2006. 8-9.)

produced throughout the year, and so on. With supply and demand, the market regulates the portions of the commodities offered for sale in line with the demand for them. But if we take a sufficiently long period, the supply and demand for that period is more or less comply with production and supply for the same period. And the discrepancy between them is precisely the causes of economic crises, which restore the broken correspondence. (See: Leiashvily, 2011, 2012, 2015.).

5. All subjects are functionally interconnected. But who exactly will perform the related function does not matter. It is for this reason that chaos arises at the micro-level. For, the action of each subject is integrated into this system of economic interactions by the possibility that a vast number of potential counterparties can perform a related function. It depends on the chance of who exactly will become a counterparty in competitive conditions and the constant search for more favorable terms of the transaction. In a decentralized economy, this creates the illusion of chaos. However, this chaos is not chaos in the usual sense of the word. Expressed in terms of Chaos Theory, it is "deterministic chaos". In particular, in the economy, competition narrows the range of variation in the parameters of transactions made in the market. The parties to the transaction, having mutually opposing interests, seek and find more profitable for them partners. The result of this is the narrowing of the spread and the formation of average parameters, against which the deviations of individual parameters of similar transactions are concentrated.

6. All subjects appear to be independent and freely decide what commodities to produce and consume, from whom to buy, and to whom to sell. Nevertheless, to produce and consume any commodities, to sell to anyone, and to buy from someone - they must. That is, they are connected to each other by *"weak ties"*. These connections are chaotic and random. They can arise here and there and just as easily break as they appear. Here the necessity is manifested through chance. There is a necessity to *sell* in order to b*uy*, and vice versa, to buy in order to sell; to be able to *consume* and *produce* - to sell again, etc. ,etc. Thus, it is impossible to avoid moving in this "enchanted circle" of operational closure. For if one breaks out of this circular causality, in which one's needs can be satisfied only by satisfying the needs of others, then the satisfaction of needs becomes impossible. It is a necessity or a law of the market economy, which is conditioned by the very basic relations of the mode of production which prevail in such an economy.

7. As noted, in a competitive market, the subject is not bound by rigid ties to one or another counterparty. But the function that he performs is rigidly tied to another function that various subjects could potentially perform. In other words, he is functionally tied to all those who perform a complementary opposite function. Each function must be performed, and, therefore, the action that implements this function must be carried out. But who exactly, which particular subject will perform this action, does not matter as long as there is competition and until performing this function is not monopolized by one or another subject.

Thus, when someone sells his product, someone else must buy it. Also, when he buys, produces, consumes, invests or consumes in debt, borrows or grants a loan. In all these cases, there must be someone else in society who will fulfill the opposite complementary function. But who would exactly do that is not important. In the face of one or another specific counterparty, each actor interacts with the entire society. All his economic actions take on the

character of interaction between the individual and society at large. Society needs the function performed by the individual just as much as the individual himself. The market economy, as a social system, is born from the social actions of individuals, and the need and incentives for implementing these actions are born by the very form of organization of such an economic system.

8. Everyone began to depend on each other. But outwardly, in the market, it seems that all agents are completely independent. It seems to each agent that his actions depend only on him. But the fact that "each branch must produce in accordance with the solvent needs of all other branches" is hidden in the deep structures of the market system. For, a separate market agent does not know how many commodities are produced in his branch, he does not know how many commodities are required to satisfy the solvent needs of other branches, and he does not know the size of the market demand for his product. He produces blindly, "backdating".

9. Each branch exchanges its products with many other industries whose products are resources for it. Accordingly, each separate producer of one branch or another can exchange his commodities with representatives of any other branch or group of branches and exchange his product for the products of these branches. But since the exchange of commodities is mediated by money, all this is hidden behind a "money veil". Therefore, the subjects, although they know with whom personally they exchange commodities for money or money for commodities. But no one knows specifically between which commodities the exchange actually takes place.

Behind specific buyers who pay money, one can't see what industry they represent and what they will produce. Also, behind specific sellers who receive money, it is not visible what commodities they buy with that money. And even if it were visible, individual transactions are just scattered facts, from which it is impossible to find out the ratio of the masses of commodities exchanged between branches. But if sectoral proportions are violated, then deficits and excesses will arise, and consequently – deviations from equilibrium prices. Some make profits above the norm, others below the norm, and some others make direct losses. There will be incentives for redistribution. But these incentives arise only from a disturbance of equilibrium proportions of commodities exchanged between branches, about which no one is informed. And these proportions are formed spontaneously. Because no one asks anyone what branch to enter, or what branch to leave, and how much to produce commodities and how much to consume, respectively, what and how much to sell, buy, invest, consume in debt, etc. But the structure of branches, their proportions, the ratio of commodity and cash flows depend on what individuals produce, consume, sell and buy. That is, the structure of the economy, which is vital for its normal functioning, is formed spontaneously.

In the event of large disproportions between branches and commodity-money flows, an economic crisis arises, and a structural rearrangement of the economy begins. A new structure of branches and commodity-money flows is being formed, more in line with the new conditions of the external environment (natural and social). This occurs because individuals at the nano- and micro-levels have to change their actions drastically and adapt to new conditions of the natural and social environment; to restore ties broken during the crisis,

or to establish new ones; to commensurate new needs with new conditions and possibilities for their satisfaction, etc.

10. But when a deviation from equilibrium disturbs the integrity of the decentralized economy and its harmonious functioning because of the emergent feature, the hidden interdependence of economic agents becomes apparent.

> *"No one can sell unless someone else purchases. But no one directly needs to purchase because he has just sold. Circulation bursts through all the temporal, spatial and personal barriers imposed by the direct exchange of products, and it does this by splitting up the direct identity present in this case between the exchange of one's own product and the acquisition of someone else's into the two antithetical segments of sale and purchase. To say that these mutually independent and antithetical processes form an internal unity is to say also that their internal unity moves forward through external antitheses. These two processes lack internal independence because they complement each other. Hence, if the assertion of their external independence [iiusserliche Verselbstiindigung] proceeds to a certain critical point, their unity violently makes itself felt by producing – a crisis." (Marx, 1976, 209.)*

This law operates behind the backs of market agents as a blind necessity, as a spontaneously acting market law. "The owners of commodities therefore find out that the same division of labour which turns them into independent private producers also makes the social process of production and the relations of the individual producers to each other within that process independent of the producers themselves; they also find out that the independence of the individuals from each other has as its counterpart and supplement a system of all-round material dependence." (Marx, 1976, 202-203.) This "material dependence", about which Marx writes, is embedded in the branch structure and manifests the emergent feature of an economic system based on the division of labor.

3.3. Relative price system

1. The invisible "*inner structure or order of economic life*", (Heilbroner) externally appears in the market in the acts of commodity exchange. Accordingly, it is possible to "dig up" mentally to this "*inner structure of economic life*" only by analysing the commodity exchange. Therefore let's consider commodity exchange in a pure form, not covered by the "money veil".

In a market economy, every commodity has the potential to be exchanged for all other commodities. In the exchange act, the commodities being exchanged are in mirror opposite relations. Each of these commodities represents a payment for the purchased ones. Commodities purchased by one side are sold by the other. I. e.,each commodity is both sold and bought at the same time. Each commodity has its own purchasing power, or *exchangeability*, which is conditioned by the solvent needs of the buyers of this commodity,

and their willingness to sacrifice their commodities for the sake of its acquisition. The magnitude of *the need* for a particular commodity or its *utility* is measured by the magnitude of costs sacrificed by the buyer to acquire it. Therefore, the exchangeability or purchasing power of a commodity in the market is determined by its utility for buyers and is estimated by the quantity and utility of commodities exchanged for it.

Moreover, in each exchange act, the purchasing power of each commodity can be expressed through the corresponding quantity of another commodity. As an indicator of the exchange rate of commodities, this quantity is the public estimate of the commodities' purchasing power or their *relative prices* expressed in the opposite commodity. In Marx's terminology, if one of the exchanged commodities is in a *relative form* of value, the other will be in an *equivalent form* of value. In the exchange act xA = yB (where: x and y are the quantities of the respective commodities), the purchasing power of commodity A can be expressed through the quantity of commodity B, or conversely, the purchasing power of B can be expressed through the quantity of commodity A. These market prices will be in inverse relation to each other: A = y/x B; B = x / y A.

2. Under conditions of division of labor, all branches[59] of the economy produce products for each other. The products of each of them are resources for branches that consume these products. The volumes of their production and consumption come into line with each other through the exchange of products in the markets. In the process of this exchange, the same reflective relations arise as in the sphere of production and consumption. Each party in the exchange offers its own product instead of the purchased one. Demand is always solvent demand. If it is insolvent, then it is not valid. But the solvency of demand is ensured by supply. Each party in the exchange is both a buyer and a seller simultaneously. If we take the totality of all branches of the economy, then a complete correspondence between their production and consumption is possible only with such proportions of the exchange of products in which the supply of products of each branch corresponds to the total demand for its product from all other branches. This reflection between production and consumption, product and resource, supply and demand, purchase and sale, is whatmakes all branches become necessary parts of a single whole. As has been noted, the essential relationship is the relationship between branches, in which each branch produces commodities under the needs of all branches. It is this essential relationship that is the organizing principle of economic processes, which determines the integrity of the economy, the formation of an optimal branch structure, and a system of optimal relative prices.[60]

3. If all branches produce commodities for each other and exchange them for the commodities they consume, then the relationship between branches will take the form: xA =

[59] Not only are branches of the production sector implied, but also branches of the consumption sector that reproduce primary resources (i.e., the *rights to use* the services of production factors).

[60] "The problem determining the heuristic possibilities of the integrity principle is the problem of substantiating wholeness in each particular case. This principle significantly complements the systematic approach, since it is aimed at finding an essential relationship, essence, absolute. It is noted that the same object can have a different set of models, but the most adequate of them will be the one that reflects the basis of the wholeness of the phenomenon under consideration as a leading moment. The concept of "whole" is directly related to the problem of optimal choice. Let the set A be a concrete whole, then the set of its constituent parts and the structure of their relations, are also concrete. ... In this sense, choosing the optimal means providing, creating, constructing the wholeness, fulfilling the creative function." (Yatskevich, 1990, 67)

yB.[61] Since all branches, and hence all commodities, exchange among themselves in certain proportions, the price of each can be expressed in units of the other commodity. So in the case of xA = yB, as was shown, the relative price A = y/xB, and the relative price B = x/yA. That is, in competitive conditions of competition, the system of equilibrium relative prices is formed at the inter-branch level, [62] and each commodity has relative prices expressed in all other commodities. Moreover, if each branch produces commodities in strict accordance with the solvent needs of all other branches, then demand equals supply for each commodity, as well as aggregate demand equals aggregate supply. Such a branch structure corresponds to a single system of relative prices. This is a state of general equilibrium. For these prices directly result from the exchange ratios between branches if the markets are completely cleared. "Any violation of equilibrium proportions will cause a deviation from equilibrium prices; .... The integrity of the economy will be violated, for the reflection between the whole and its parts will disappear. Iterations between relative prices and interbranch structure occur until a new equilibrium is established between production and consumption." (Leiashvily. 2021, 6)

4. The exchange ratios of a given commodity with many other commodities generate numerous different indicators, i.e., a series of relative prices. This series is a qualitative characteristic of this commodity. The exchange ratios of any other commodity with the same set of commodities give rise to another series of indicators. For example, two commodities that are indifferent to each other and are compared with each other have different series of indicators of the exchange ratios that they form with the same set of other commodities that oppose them. These series are series in which the relative prices of the two mentioned commodities are expressed through the same set of commodities exchanged for them. Since these series consist of different indicators, it seems that the two commodities themselves being compared, which with the help of these series, express their qualitative certainty, have nothing in common. In order to compare these two commodities, some common for-itself unit is required. Although it seems that such a common unit does not exist, in reality such a common "unit" or a constant for their comparison, is in these series themselves. Although both series differ from each other in the *composition* of their indicators, the *ratios* between the indicators themselves within each of these series are the same. For, the same set of commodities served to express the relative prices of the two commodities being compared. Exactly these ratios of indicators within the series are the common constant for comparison. Now it becomes possible to compare these two commodities by comparing the series of relative prices expressing them.

[61] Of course, typical barter problems can arise when branch A needs the products of branch B, but branch B does not need products A, but needs the products of a third branch C, which, in turn, does not need the products of branch B, but needs products of branch A, etc. But this problem is easily resolvable and comes down to the fact that branch A pays for the goods received from branch B with its goods supplied to branch C. For the goods received from branch C, branch B pays for its goods supplied to branch A. Similarly – branch C. Many branches can be involved in such an asymmetric scheme of barter relations. It doesn't change the essence of the matter. Therefore, the relationship between them in all cases can be reduced to the form **xA = yB**.

[62] Since the branches of both the production and consumption sectors (reproducing primary resources) together form a single system of branches, the prices of all products and resources (including Wages, Rent, and Profit) are interconnected and also represent a single system of prices.

5. What is true for two commodities is also true for many commodities. Instead of the two commodities from the previous example, as commodities indifferent to each other and compared with each other, we can take all primary resources (a, b, c ....). But as a set of commodities opposing them, through the exchange ratios to which their series of indicators (a′, b′, c′...) are formed, we can take the set of final products (α, β, γ ....). Following the previous logic, although these series (a′, в′, c′...) differ from each other by the *composition* of their indicators, the *ratios* between the indicators themselves within these series are the same. For, the same set of final products (α, β, γ ....) served to express the relative prices of various primary resources (a, b, c ....). It is these ratios between indicators within the series that are the common basis, the constant for comparing primary resources with each other.

6. But further, all products from that set of final products (α, β, γ ....), through which the primary resources (a, c, c ....) compared with each other expressed their qualitative certainty, are themselves independent commodities. And they are also opposed by primary resources (a, b, c ....), through which they themselves can express their qualitative certainty and be compared with each other. That is, a series of primary resources and a series of final products are in mirror-symmetric relations to each other.

So, *two series* of commodities are opposed - a series of primary resources and a series of final products. Each of the primary resources expresses its purchasing power through a *series of indicators* of exchange ratios with a series of final products. And since within these *series of indicators,* the ratios between indicators are constant, then the primary resources become comparable with each other and, therefore, are themselves in certain exchange ratios. The same can be said about final products. Each final products expresses its purchasing power through a *series of indicators* of exchange ratios with a series of primary resources. And by the same logic, final products are in certain exchange ratios with each other.[63]

Thus, between primary resources (within a series of primary resources), and between final products (within a series of final products), and, therefore, between all primary resources and all final products, there are certain exchange ratios that express their ability to exchange for each other, that is, their purchasing power. These exchange ratios among all commodities, or their *relative prices*, are expressed by *indicators*, simple *numbers*, or *coefficients* of exchange.

7. At the same time, it is not necessary to confine ourselves by consideration of exchange ratios only between primary resources and final products. The same regularities remain valid for all commodities, including intermediates. And since they all are commodities, it ultimately turns out that each commodity has its own series of indicators of exchange ratios with all other commodities. All these series differ from each other only in the *composition* of their indicators but not in the *ratios between* these indicators.

However, these constant *ratios between* indicators are themselves nothing but a *series of indicators* that shows the *ratios between the purchasing powers* of all commodities, but shows them already in a unified form. In other words, this series of indicators shows each

[63] "In this way, both sides are a series in which, *first*, each number is simply a unit with respect to the opposite series in which it has its specifically determined being as a series of exponents; *second*, each number is itself one of the exponents for each member of the opposite series; and, *third*, it is a comparative number for the rest of the numbers of its series and, as such an amount which belongs to it also as an exponent, it has its unit, determined for itself, in the opposite series." (Hegel, 2010, 307.)

commodity's exchangeability for all other commodities. This unified form of ratios between the purchasing powers of different commodities is hidden behind a multitude of exchange ratios between commodities, i.e. hidden behind the multiplicity of their relative prices. However, in the future, because of the development of market relations, the emergence of money reveals this hidden series of relationships and unambiguously expresses it in monetary form, as a series of money prices. This series of absolute prices, or the unified monetary form of expressing the relative prices of all commodities, thus brings to light the relative purchasing power of these commodities from the veil and seeming chaos of barter prices.

Questions naturally arise: Why are commodities exchanged precisely in such proportions and not in others? In other words, what does the purchasing power of commodities, their relative prices, depend on? The very fact that all commodities are exchanged among themselves according to well-defined proportions suggests that there is a certain *homogeneous substance* that is contained in all commodities, but in *different quantities*. One may assumed that the exchange proportions of commodities are formed by equating this homogeneous substance contained in them. The thought arises that this substance may be the market value of commodities, which is hidden behind their relative prices, just as the subjective values of goods were hidden behind their subjective valuations in the subsistence economy. But the subjective values of various market agents are not comparable with each other. Therefore, the relative prices of commodities exchanged in the market between different agents cannot be based on their subjective values. But what, then, is this "mystical" substance? Why is it found in different commodities in different quantities?

3.4. Money

1. Of the whole variety of commodities, one of them (usually gold or silver) is withdrawn from the sphere of consumption and begins to circulate as an intermediary in exchange relations, performing the function of money as a medium of exchange. That it was gold or silver that performed the function of a monetary unit is due to their physical properties and random circumstances.[64] Theoretically, any of the commodities can perform the monetary commodity function. Its purchasing power will be conditionally taken as the unit of measurement for the purchasing power of all other commodities. Depending on the chosen monetary commodity, the prices of all commodities will be expressed by different indicators, but the ratios between them will remain unchanged.

[64] In general, the choice of a unit of measurement for something, whether it be the length, weight, volume, or something else, is due to random circumstances that are insignificant for the unit of measurement itself. "A measure, in the usual sense of a standard, is a quantum which is arbitrarily assumed as the unit *determinate in itself* as against an external amount. Of course, such a unit can in fact also be determinate in itself, like a foot or some such other original measure; to the extent, however, that it is used as the measuring standard for other things, it is with respect to them only an external measure, not their original measure. – Thus the diameter of the earth or the length of a pendulum may be taken as a specific quantum on their own account. But the choice of a fraction of the earth's diameter or of the pendulum's length, and this last under which degree of latitude, for use as a standard of measure is arbitrary. And for other things such a standard is something even more external." (Hegel, 2010, 289.)

2. All commodities begin to be exchanged for gold, a certain amount of which is conventionally accepted as a unit of purchasing power. Thus, all commodities express their *relative prices* in a certain number of monetary units. But expressed in money, they already become *absolute (nominal)* prices. In this form, all commodities, although they are qualitatively different from each other, become quantitatively commensurable through their absolute prices, which are simple numbers, and indicators of the exchange ratios between commodities and money. And since all relative prices are interconnected, the absolute prices of all commodities depend on one another and represent a single system.

Prices are system magnitudes. Each price is a function of all other prices. In mathematical terms, prices are a *mathematical group*. A change in the price of any one commodity affects the prices of other commodities. Evaluating commodities in such a unified form greatly facilitates the adoption of economic decisions and accelerates economic processes. Instead of a vast series of relative prices, each commodity receives a single monetary price. Accordingly, instead of a multitude of a series of relative prices, the price system is represented by a single series of money prices.

3. If all commodities were exchanged for each other in earlier times, now they are exchanged only for money. And the economic process externally manifests itself not as a system of counter flows of commodities, but as a system of counter flows of commodities and money.[65] It is no longer visible what commodities are exchanged for what, in what proportion, and in what volume. Neither barter relative prices nor the emergent property of the system, on which the logic of market optimization is based, can be seen behind absolute prices.[66] Outwardly, we can observe only the exchange of commodities for money. This does not change the essence of the self-regulation mechanism, however, there is a gap in time between the sale of some commodities and the purchase of others, which gives rise to the possibility of crises.

4. As noted, the economy is in equilibrium when each branch produces according to the solvent needs of other branches. In a barter economy, the equality of aggregate demand and aggregate supply means that the above equilibrium condition is met. But with the advent of money, the equality of aggregate demand and aggregate supply is a necessary but not sufficient condition for equilibrium. It does not guarantee that each branch will produce commodities in accordance with the solvent needs of other branches. For, in a money economy, the solvent needs of branches are no longer expressed in the commodities they produce, but in money.

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[65] "That this one-sided form of motion of the money arises out of the two-sided form of motion of the commodity is a circumstance which is hidden from view. The very nature of the circulation of commodities produces a semblance of the opposite. … Hence although the movement of money is merely the expression of the Circulation of commodities, the situation appears to be the reverse of this, namely the circulation of commodities seems to be the result of the movement of money." (Marx, 1976, 211-212.)

[66] The emergent property of a market economy (according to which each branch produces in accordance with the solvent needs of all other branches) provides a tendency towards an equilibrium state of the system and underlies the mechanism of its self-regulation. Looking ahead, we note that this property of the market system and its tendency to equilibrium is born by the operation of the *law of value*, in which agents of a competitive market are forced to exchange goods on an equivalent basis. The law of value is the regulator of the economy, the "invisible hand" about which A. Smith wrote.

With the advent of money, the economy's financial sector appears, where money can flow out of the real sector, or, conversely, flow from there into the real sector. In such an economy, veiled by monetary processes, the entire market process is presented in a mystified form. For behind the veil of money, it isn't easy to *see* the emergent property of the economy, which forms it as a whole. In other words, we do not see that essential relationship between the whole and its parts, thanks to which the economy appears as a harmonious interaction of its constituent branches. A. Smith's metaphor about the "invisible hand" is filled with concrete meaning.

5. Depending on which commodity is accepted as a unit of market value, absolute prices will vary, but relative prices remain unchanged until the branch structure changes. For the normal functioning of the system, from a theoretical point of view, it does not matter which commodity performs the functions of a money commodity, *what amount* of money commodity is in circulation, nor even whether the commodity, paper knotes, or digits in computer memory are money at all.

Fiat or credit money has value in the same way as commodity money due to the very fact of its scarcity and universal acceptance as a medium of exchange. This is so since the value is merely a subject-object *relation* to limited goods, and not any *property* of the goods themselves, due to which such a relation to them arises.

In order for money to perform its function correctly, it is only important to ensure the *stability* of the amount of money in circulation.

6. Under barter conditions, commodities were bought by commodities, and each commodity embodied purchasing power as the ability to buy other commodities. Now, this ability to buy other commodities is delegated to only one monetary commodity, which falls out of consumption and circulates. The process carried out in the form — $Т_0$ - $Т_1$ - $Т_2$ -$Т_3$ - $Т_4$ – ... was transformed into a process – $Т_0$ - $Д_0$ - $Т_1$ - $Д_1$ - $Т_2$ - $Д_2$ – .... . Now the purchasing power of money is the ability to buy *any* commodities, and the purchasing power of commodities is the ability to buy *only* money.

Since commodities are no longer exchanged for each other but only for money, money has become a *universal* commodity. Money can buy any commodities. Because of this, they have an abstract utility that can be transformed into the specific utility of any particular commodity. Since money is the ability to buy *any* commodities, and consequently, is a *universal* purchasing power, it gains a special power in the world of commodities and becomes a *universal need*.

7. Everything that can perform monetary functions is money. Therefore, in essence, money is not so much a material carrier of monetary functions, but the totality of these functions itself. The fact that in its day gold emerged from the world of commodities as money became possible because, like other commodities, it itself had a value. And gold had purchasing power because it had value. But as money, gold, on the contrary, has value because it has purchasing power. And the source of this power is the *universal need* for those functions that money performs (medium of exchange, means of payment, and measure of value). Gold, as money, acquires value because, by virtue of its functions, it has power over all commodities and, thanks to this, provides economic freedom to its owners. The very power vested in the money has a value, be it gold, silver or symbolic money. But the power of money depends on its purchasing power, or on its *exchangeability*, which in turn depends

on the *relative scarcity* of money in the world of commodities. Otherwise, it depends on the quantitative ratio of money and commodities. As a result, the value of gold *as a commodity* begins to diverge from the value of gold *as money*. Over time, it becomes possible to replace commodity money with paper money, and later with credit money, simple entries in ledgers or in computer memory.

8. The world of commodities, split into two opposites, in which gold played the role of commodity money, subsequently unites again. Gold returns to the world of commodities (as a privileged commodity), but in its place leaves its symbol - paper money.[67] Banknotes or other monetary symbols are of negligible value compared to the value of the power and freedom they confer to their owner.

Depending on the distribution of money, some subjects have more economic power, others less. The power of money extends over all subjects as everyone needs them.[68] Since money becomes a universal need, then, unlike the need for specific commodities, the need for money has no limits. *Everyone* needs money, *always* and *everywhere*, without limitations, while the need for commodities is limited. Everyone needs them only until the saturation of one or another specific solvent needs.

9. Under barter conditions, all subjects exchanged produced commodities for consumed ones (T_1 - T_2). But with the advent of money, a single act of exchanging of commodities is torn into two parts - selling (T_1 - D), and buying (D - T_2), and the whole process takes the form: D_0 - T_1 - D_1 - T_2 - D_2 -T_3 - D_3 - .... etc.. "From here, as Aristotle concluded and Marx put at the centre of his definition of capital, two kinds of exchanges emerged: buying for selling (hopefully at a profit) or buying for consuming, having sold to acquire the needed money to buy that which is needed to try to satisfy a felt need.[69] In the latter, money is just a means for exchange, placed between two different use-values, while in the former it becomes an end in itself, being used for its secondary purpose and aimed at an increase in exchange-values. By introducing money as an intermediate link between two different commodities (C_1– M – C_2) facilitating an exchange between two different use-values, you also open the doors for putting a commodity as an intermediate link between two exchange-values, the aim being to increase your capital (M_1 – C – M_2 aiming to get $M_2 > M_1$)." (Stahel, 2020, 4.)

[67] "Hence in this process which continually makes money pass from hand to hand, it only needs to lead a symbolic existence. Its functional existence so to speak absorbs its material existence. Since it is a transiently objectified reflection of the prices of commodities, it serves only as a symbol of itself, and can therefore be replaced by another symbol." (Marx, 1976, 226.)

[68] Under such conditions, those with a lot of money gain power over those with little or no money. The greater the economic inequality, the greater the power of some people over others. As a result: "Things which in and for themselves are not commodities, things such as conscience, honour, etc., can be offered for sale by their holders, and thus acquire the form of commodities through their price." (Marx, 1976, 197.)

[69] "Formally Marx portrayed the first one as M1 – C – M2 aiming to get M2 > M1 (money here being used to buy a commodity which is later to be resold at a profit), while in the latter we have C1 – M – C2 (here a commodity is sold in order to earn the money needed to acquire another, different commodity with it). In the first case, the aim is quantitative, the intervening quality of the commodity not being of the essence, being just a mean-to-an-end, while in the second case it is the qualitative difference between the commodity possessed at the beginning of the circuit with respect to the one acquired at the end which is of the essence. Exchanging something you need less in order to acquire something you desire more. In both cases, the intermediating link is just a means-to-an-end." (Stahel, 2020, 4)

10. With the emergence of the opportunities for profit, in the money economy have appeared *entrepreneurial* individuals, whose primary goal was money and enrichment.[70] Everyone needs money, but some need it mainly as a goal, while others need it to buy commodities.

Since money provides the opportunity to profit by "producing commodities by means of commodities" or by buying and selling commodities, the right to use the services of money itself becomes the most demanded commodity. Money becomes capital, yielding interest. The owner of money capital sells the right of temporary use of the services of money exactly like the owners of the Labor force, Land, or Physical Capital sell the right of temporary use of the services of these production factors. The interest rate is the price for the right to use the services of money temporarily, just as Wages or Rent (for Land and Physical Capital) is the price for the right to use the services of these production factors.

11. In such conditions, it is possible to make a profit not only through the *production* of commodities or the *purchase* and *sale* of commodities. But the services of money itself can also become an object of buying and selling. Since money provides an opportunity to profit in the sphere of production or trade, the services of money become a demanded commodity. First, there appear usurers – owners of money capital who sell the *right* to *use* the services of money temporarily and charge interest as payment for it. Somewhat later, bankers as financial intermediaries appear. They buy these *rights* at a low price from those who have surplus money, and sell them at a high price to those who temporarily need them. In other words, they borrow money at low interest and lend at high interest. The difference between the interest received and paid is their profit.

12. Since gold, with its value, returns to the commodity world, and leaves in its place simulacra, endowed with an equivalent value, the total value of the commodity world has doubled. It appears as two counter, equal in magnitude and opposite in sign value flows of commodities and money. Since money is a universal commodity and has universal *exchangeability* (liquidity), all commodities go where money goes, and money goes where there are commodities demanded by the owners of money. One way or another, money becomes the driving force of economic processes.

13. The purchase and sale of commodities turn into the sale and purchase of money, which serves as a way of fixing society's debt to the owner of the money. For, the fact that the subject has money testifies that its owner has transferred a socially valuable commodity to society, but, in return, has not yet received another commodity of equivalent value from it. He has only received money, indicating his contribution to producing valuable commodities for society. By buying commodities with this money, society repays its debt in the form of commodities he needs of equivalent value.[71]

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[70] In general, production, trade, finance, and business, are set in motion by the efforts of entrepreneurs, for whom the main motive for economic activity is profit and enrichment. "The increase in wealth is to a large extent an end in itself as well as a means to the increase of income. … in business generally, produce wealth to be used in producing more wealth with no view to any use beyond the increase of wealth itself. … We can hardly over-emphasize the fact that the dynamic urge back of modem economic life is the desire to increase wealth, rather than a desire to consume goods,…" (Knight, 1921, 319 -320.).

[71] There is no basis for scientific disputes over whether they have a commodity or credit origin. In different economies, both are possible. These are just different ways of the emergence of commodity-money relations. Commodity money in itself is a form of manifestation of credit relations. "Shortly, the Credit Theory

3.5. Birth of macro-order from micro-chaos

1. Separate acts of commodity-money exchange, *chaotically* arising at the micro-economic level, takes the form of an ordered system of counter flows of commodity and money on the macroeconomic level. How does order arise from the chaos of uncontrolled actions in a decentralized economy? After all, various subjects proceed from their own interests and are guided by subjective values and, accordingly, by subjective valuations.

Although the subjective assessments of different individuals are incommensurable with each other, but if the exchanging parties made a decision and the exchange act took place, then this could happen only according to this or that exchange ratio. During a certain period of time, a vast number of exchange acts occur on the market between two similar commodities. These transactions involve many subjects with different subjective values. Accordingly, in each of these transactions, different exchange ratios, or, what is the same, different *individual prices*, are formed.[72] But the *market prices* of these commodities are weighted averages of the entire set of individual prices at which transactions were made during the specified period.[73] Market prices serve as a benchmark for each agent to decide whether to continue looking for better deals. Besides market prices, each transaction takes into account macro-economic conditions common to all (inflation, unemployment, optimism or pessimism, etc.), to which each agent reacts differently. It also considers conditions unique to each subject (its production capabilities, consumer preferences, rational expectations,

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is this: that a sale and purchase is the exchange of a commodity for a credit. From this main theory springs the sub-theory that the value of credit or money does not depend on the value of any metal or metals, but on the right which the creditor acquires to 'payment,' that is to say, to satisfaction for the credit, and on the obligation of the debtor to 'pay' his debt, and conversely on the right of the debtor to release himself from his debt by the tender of an equivalent debt owed by the creditor, and the obligation of the creditor to accept this tender in satisfaction of his credit. Such is the fundamental theory, but in practice it is not necessary for a debtor to acquire credits on the same persons to whom he is debtor. We are all both buyers and sellers, so that we are all at the same time both debtors and creditors of each other, and by the wonderfully efficient machinery of the banks to which we sell our credits, and which thus become the clearing houses of commerce, the debts and credits of the whole community are centralised and set off against each other. In practice, therefore, any good credit will pay any debt. Again in theory we create a debt every time we buy and acquire a credit every time we sell, but in practice this theory is also modified, at least in advanced commercial communities. When we are successful in business, we accumulate credits on a banker and we can then buy without creating new debts, by merely transferring to our sellers a part of our accumulated credits. Or again, if we have no accumulated credits at the moment when we wish to make a purchase, we can, instead of becoming the debtors of the person from whom we buy, arrange with our banker to 'borrow' a credit on his books, and can transfer this borrowed credit to our seller, on undertaking to hand over to the banker the same amount of credit (and something over) which we acquire when we, in our turn, become sellers. Then again, the government, the greatest buyer of commodities and services in the land, issues in payment of its purchases3 vast quantities of small tokens which are called coins or notes, and which are redeemable by the mechanism of taxation, and these credits on the government we can use in the payment of small purchases in preference to giving credits on ourselves or transferring those on our bankers. (Innes, 2004, 51-52.)

[72] "The possibility, therefore, of a quantitative incongruity between price and magnitude . of value, i.e. the possibility that the price may qiverge from the magnitude of value, is inherent in the price-form itself. This is not a defect, but, on the.contrary, it makes this form the adequate one for a mode of production whose laws can only assert themselves as blindly operating averages between constant irregularities." (Marx, 1976, 196.)

[73] We are talking about actual current market prices and not about equilibrium prices. Equilibrium prices are ideal market prices in the case of an optimal branch structure, in which everything that is produced is consumed, and everything that is consumed is produced. But the actual prices and the actual branch structure always strive towards the optimal but never reach them due to the incessant changes in technology, needs, natural and social conditions, and other destabilizing influences of the external environment.

comparative advantages, etc.). The result of this is that in each individual transaction, the individual prices of commodities deviate to some extent from market prices. "Accordingly, the set of individual prices, which will be formed as a result of individual deviations from existing market prices, will in general fully reflect all changes in the needs and production capacities of society. There is an inverse relationship between individual and market prices. ... Therefore, the set of individual prices, which is formed by deviating from current market prices, serves as the basis for the formation of new market prices, which, in turn, will become new reference points for the formation of a new set of individual prices, etc. without end. Individual and market prices are formed in an endless process of circular causality. They infinitely change each other. ... In this case, individual deviations from market prices occur consciously, but the formation of market prices, as average magnitudes, occurs spontaneously. For, although the deviation of individual prices from market prices in each transaction occurs consciously, but the very ***set*** of individual prices (the ***number*** of transactions and the ***bigness*** of individual prices in each of them), on the basis of which average market prices are formed, is formed spontaneously." (Leiashvily, 2021,11-12.).

2. Just as individual and market prices are formed based on feedback between them, micro- and macroeconomic parameters are formed similarly. When market prices change, subjects change the individual parameters of their production and consumption, supply and demand, the number and volume of exchange transactions, individual prices, etc. But the aggregated results of these changes are new macroeconomic parameters of production and consumption, aggregate demand and supply, sectoral structure, dynamics of economic processes, public moods of optimism and pessimism, and so on. In other words, those macro-economic conditions are changing, based on which individual decisions were made at the micro-level and individual parameters of economic activity of subjects were formed. Self-regulation of the market economy occurs due to this feedback between micro- and macro-economic processes.

> *"One of the earliest insights of economics—it certainly goes back to Smith—is that these aggregate patterns form from individual behavior, and individual behavior in turn responds to these aggregate patterns: there is a recursive loop. It is this recursive loop that connects with complexity. Complexity is not a theory but a movement in the sciences that studies how the interacting elements in a system create overall patterns, and how these overall patterns in turn cause the interacting elements to change or adapt. ... Complexity is about formation—the formation of structures—and how this formation affects the objects causing it. To look at the economy,... from a complexity viewpoint then would mean asking how it evolves, and this means examining in detail how individual agents' behaviors together form some outcome and how this might in turn alter their behavior as a result. Complexity, in other words, asks how individual behaviors might react to the pattern they together create, and how that pattern would alter itself as a result." (Brian, 2015, 3.)*[74]

[74] "What until now seemed mysterious, inexplicable or even paradoxical, suddenly becomes completely clear. We find that the collective behavior of many separate individuals (be they atoms, molecules, cells, animals or people) and, ultimately, their own destiny is determined by themselves in the course of their interaction with each other: through competition, on the one hand, and cooperation on the other. . . . . In this sense, synergetics can be viewed as the science of collective behavior, organized and self-organized, and this behavior is subject to general laws. When a science declares the universality of its laws, this immediately produces very important consequences. Synergetics draws on very different disciplines, including not only

As in the case of individual prices, all individual parameters of the economic activity of subjects are formed based on their conscious decisions. But since no single center coordinates the subjects' actions, the formation of market prices and macroeconomic parameters, which are based on these individual parameters, occurs *spontaneously*. "For, in the absence of external regulation, from the chaos of uncoordinated actions of a multiplicity of independent agents, the very ***set*** of different individual parameters are spontaneously formed, from which, in turn, the system's uniform parameters are formed. This is an essential factor determining the elements of spontaneity and uncertainty in a self-regulating decentralized economy, in which the macroeconomic order is born out of microeconomic chaos." (Leiashvily. 2021, 12.)

3. Pricing doesn't happen at the micro-level. It occurs in the entire system as a whole, simultaneously at the micro and macro levels. Without a clear understanding of how this happens, it is impossible to bridge the existing gap between micro- and macro-economics.

3.6. Market value

1. Economic science has studied market value from the very beginning of its inception. But in economic theory, the problem of value turned out to be so difficult that the neoclassicists stopped studying it altogether and practically replaced it with the problem of price. As a result, both problems - the problem of value and the problem of price remained unclear. "*The general problematic of value, …, is the effort to tie the surface phenomena of economic life to some inner structure or order*. … Empirical investigation into the provisioning process is an essential, indeed a constitutive, part of economic inquiry, but it is not the only such part. Equally necessary for the existence of what we call economic thought is a level of abstract inquiry—an inquiry directed not at the "facts" of economic life but at some structure or principle "behind" the facts. … Economics now becomes an inquiry into the systemic properties, the structural attributes, the tendencies and sometimes even the *telos* of the provisioning process. Thus behind empirical investigations into allocation problems we have theoretical premises as to the "workings" of the price mechanism; behind the functional equations of econometric models there are assumptions as to the "laws" of behavior of individuals, or perhaps even the "laws of motion" of the capitalist system; behind input output matrices are "production functions," equally abstract representations of the idealized behavior of the industries in question." (Heilbroner, 1988, 106 - 107) [75]

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physics, chemistry and biology, but also sociology and economics…" (Haken, 2003, 24-25) "When we henceforth speak of collective behavior, we will mean by this behavior in which people act as if they had colluded among themselves." (Ibid., 165) "Here again we encounter a peculiar relationship between separate individuals and an ordered structure. Structure subjugates individuals; however, the reverse is also true: it is individuals who maintain the existence of the structure. (Ibid., 189)

[75] "Every economist knows that Smith, despite his beaver and deer parable, felt impelled to explain prices on a basis different from pure labor inputs. This was because he recognized that, in all social stages beyond that of "rude" society, capital and land were undeniably involved in the pricing process, and that a theory of value that ignored them could not serve as a foundation for explaining the basis of exchange. Thus Smith took his well-known recourse to the description of exchange value as composed of the "natural" prices of the three constituent cost-elements in commodities – the wages of labor, the rent of land, and the profits of capital. Every

To make sense of the problem of market value, it is necessary to understand how subjective economic values and valuations form it.

2. In each exchange act, when comparing the values of exchanged commodities, both parties are guided by their subjective evaluations and opposing interests. With a barter exchange, the parties evaluate the subjective value of sold commodities in terms of the individual costs of their production and sale, and the subjective value of the purchased commodities is evaluated in terms of the subjective utility acquired through these costs. Each party in the exchange compares the value of the sold commodity with the value of the purchased commodity only on its own subjective scale of values. The decision to exchange is made only if, for each party, the utility of the purchased commodity is greater than the costs of production and selling the sold commodity; in other words, if the subjective value of the purchased commodity is greater than the subjective value of the sold one. If there is no increase in value, the transaction loses economic sense for them.

The opportunity that both parties receive surplus value stems from the fact that, first, the parties have different value systems, and, secondly, they have a mirror-opposite attitude towards the exchanged commodities. A commodity, which for one party is the embodiment of costs, for the other party is the embodiment of utility. However, the range of exchange proportions acceptable to both parties has its limits. Outside this range, the transaction cannot be mutually beneficial since, in this case, the gain of one party becomes possible only at the expense of the other parties losses.

But even within the specified range, each party seeks to maximize its benefits - to get maximum utility with minimal costs. This manifests itself in the desire of each party to exchange a smaller quantity of its commodities for the largest possible quantity of purchasable commodities. Therefore, although the transaction remains mutually beneficial, it may be *more* beneficial for one party, and *less* beneficial - for the other. The actual exchange proportions, within a mutually acceptable range, depend on the parties' bargaining power. But if the exchange occurred, it occurred according to a certain proportion and, consequently, each commodity received its individual price, expressed in the quantity of the opposite commodity exchanged for it.

3. Agents cannot directly perceive the market value of commodities, i.e. their social economic value. This requires market prices, i.e. their public valuations. As was shown, social valuations are formed based on individual prices in individual exchange acts, and individual prices are formed based on individual valuations i.e. subjective valuations. That is, in the final analysis, social valuations result from the aggregation of individual valuations. But since the individual valuations themselves are formed based on individual values,[76] the

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economist also knows that on two counts this is an unsatisfactory basis for resolving the value issue. First, it ignores tha fact that wages, rents, and profits are themselves prices whose relation to some ordering principle must be explained rather than passed over. Second, it is mute in the face of query, "What is the *substance*or , if you will, the *nature* of the 'value' that enters into all three elements?" With respect to labor, as we have seen, the classical economists overlooked the problem of defining a common unit of effort. But even assuming that one could constitute such a unit from labor's "toil and trouble", no counterpart in terms of basic unit of input was ever adduces for land and capital. (Heilbroner, 1988,116-117.)

[76] Individual (subjective) evaluations are formed as a result of the *commensuration* of various subjective values. The subject always has to do this when he decides and chooses between the values of various goods. Over time, as a result of multiple repetitions, certain goods are assigned certain values in his mind (until a reevaluation of values occurs). Thus, a system of a person's subjective evaluations is formed.

very logic of the formation of social valuations suggests that along with their formation on the basis of individual valuations, in the same process, the formation of social values based on individual values takes place. And this means that social valuations reflect social values in the same way that individual valuations reflect individual values. In other terms, the market value of commodities appears externally in market prices.[77] Thus, the market value of commodities is also formed based on subjective values, as well as market prices - based on subjective valuations.

But this is only one side of the formation process of market values and market prices. The other side of this process is the inverse effect of market values and market prices on subjective values and subjective valuations, which occurs with the help of the feedbacks between micro- and macro-economic processes described above.

4. The exchange of commodities between two economic agents is an elementary exchange act xA = yB, from which a market economy is born. Behind the outward simplicity of this act is hidden the problem that Aristotle had already discovered. "Money, then, acting as a measure, makes goods commensurate and equates them; for neither would there have been association if there were not exchange, nor exchange if there were not equality, nor equality if there were not commensurability. Now in truth it is impossible that things differing so much should become commensurate, but with reference to need (hence, also utility - P.L.) they may become so sufficiently." (Aristotle, 2009, 90.) By pointing to the need (and thus to utility) as a *sufficient basis* for commensuration, Aristotle gives the correct reference point for further analysis, although he himself does not delve into this problem. [78]

Only quantities of the same quality can be commensurable. As empirical objects, exchanged commodities differ qualitatively from one another; their properties are incommensurable. Some commodities may have some common properties, but such a common quality that absolutely all commodities without exception possess, and *based on which they can be commensurate*, according to the above, can only be their ability to satisfy a need in general, i.e., the abstract need. Since the inverse side of an abstract need is abstract utility, it follows that the general quality of commodities is abstract utility. And assuming that commodities are produced by the consumption of commodities, in the process of which their utility is converted into costs, it is easy to conclude logically that the common quality of all commodities, besides abstract utility, is also abstract costs and, consequently, economic value, as a unity of abstract utility and abstract costs.

5. However, another problem arises. It turns out that the exchanged commodities must be both equal and unequal at the same time. They should be equal as social values (market values) and not equal as individual values (subjective values). Each subject decides to exchange only if the subjective value of the purchased commodities is greater than the

[77] "The general problematic of value, …, is the effort to tie surface phenomena of economic life to some inner structure or order." (Heilbroner, 1988, 105)

[78] But an objection arises if the distinction between concrete and abstract needs (and their corresponding utilities) is not pointed out. For, specific needs (utilities) are 'so different' and 'cannot become commensurable', as are the 'things' about which Aristotle writes. Commenting on the quoted thought of Aristotle, Marx writes: "'There can be no exchange,' he says, 'without equality, and no. equality without commensurability' …; Here, however, he falters, and abandons the further analysis of the form of value." (Marx, 1976, 151.)

subjective value of the sold commodities.[79] This is possible only because the subjective values of counterparties differ from each other. Otherwise, the transaction cannot be profitable for both subjects at the same time. But as social values, the exchanged commodities are equal.

The fact is that each party in the exchange is an equal member of society, and each of them represents a part of the public demand for the purchased commodity and a part of the public supply of the commodity sold. If this single transaction has been completed, then in their person society has recognized the social utility of each of the exchanged commodities, and, accordingly, has recognized the utility of the social costs for the production of each of them. Therefore, considering the exchange of goods (xA = yB) between two subjects, in their person, society compares the social utility of the purchased commodities with the social costs of producing the commodities sold. If the exchange act took place, then this confirms the mutual recognition by the subjects, as representatives of society, of the social values of both goods.

Thus, this single transaction confirms that, in the given exchange proportion, the exchanged commodities represent equal social values, but different subjective values.[80] The costs and utilities of the exchanged commodities, which are incommensurable in the subjective valuations of the parties, become commensurable in a single system of market prices, in which the social costs and social utilities of all commodities are expressed.

6. Speaking of *subjective* values, it usually refers to individual values, which are as unique as the individuals themselves. But social value usually means *objective* value. However, social value, which is formed based on the interaction of individual values, is objective only in relation to individuals. For, although the social values of commodities, are formed based on the subjective values of interacting individuals, they do not depend on the values of any of them separately. However, by their nature, social economic values are also subjective values in the sense that they represent the values of society as a collective subject. They exist only in the intersubjective space of social consciousness. Social economic values are society's attitude to certain economic goods as *socially useful* goods that can satisfy its

[79] The 18th-century French economist Candillac wrote: "It is not true that in an exchange "of commodities we give value for value. On the contrary, each of the two contracting parties in every case gives a less for a greater value ... If we really exchanged equal values, neither party could make a profit. And yet they both gain, or ought to gain. Why? The value of a thing consists solely in its relation to our needs. What is more to the one is less to the other, and *vice versa* ... It is not to be assumed that we offer for sale articles essential for our own consumption ... We wish to part with a useless thing, in order to get one that we need; we want to give less for more … It was natural to think that, in an exchange, one value was given for another equal to it whenever each of the articles exchanged was of equal value with the same quantity of gold .... But there is another point to be considered in our calculation. The question is,whether we both exchange something superfluous for something necessary." (Quoted from: Marx, 1976, 261.) (Obviously, by "values" here are meant subjective values.)

[80] At the same time, it should be taken into account that the individual parameters of production, consumption, and exchange differ significantly for different individuals. But all of them can be expressed both in subjective evaluations that are incommensurable for different individuals and in common for all social evaluations, i.e., at market prices. Based on individual parameters, average social parameters are formed by aggregation and averaging. It should also be noted that the individual prices of an exchange transaction are formed on the basis of subjective evaluations of the parties. Individual prices are only the exchange proportions in a single market transaction formed as a result of an agreement between the parties. Different individuals' subjective values and evaluations are unique; they are not commensurate and therefore cannot be directly aggregated. However, the formation of market prices based on individual prices automatically means that the formation of social values occurs on the basis of subjective values.

needs. And after satisfaction of its needs, the *social utility* of these goods is perceived as a *social cost*.

7. By analogy with individual values, social values represent the unity of utility and costs. But the utility and costs of society as a collective subject are implied. In other words, market value is the unity of *use value* and *production value*. Here, use value is understood as the value seen from the side of *social utility*,[81] in contrast to the production value, which reflects the value from the side of *social costs*. At that, the production value consists of two components - 1) the sum of utilities of the sacrificed social resources and 2) the spiritual efforts of the society related to the adoption of economic decisions.[82]

8. Utility is only an *assumption* about the ability of a good to satisfy a need. The truth or falsity of this assumption will become clear only when the utility turns into costs or losses, that is, when utility itself no longer exists. And costs are only a *memory* of the utility of a good that has already satisfied a need. That is, the memory of what was, and not the knowledge of what is. In other words, neither utility nor cost is something directly existing. They are either an assumption or a memory of the subject's specifically human, teleological attitude to this or that good. This means that value, as a unity of utility and costs, is something that does not exist in determinate beings, but only in individual and collective consciousness in the form of mental acts of assumption and recollection. That is, these are purely mental processes. However, it is on their basis that a choice is made between alternatives, economic decisions are made, individual and market prices arise, which coordinate the actions of independent agents, regulate economic processes and form a macroeconomic order out of microeconomic chaos.

3.7. Law of Value

1. As we see, despite the apparent independence of economic agents, in reality, they all depend on each other. But their connections, which are based on the exchange of equal values, are hidden in deep economic structures. "The value problematic concerns the nature of this 'deep structure' within economic life and the manner in which it influences the surface phenomena of production and distribution. It mast therefore be apparent why the search for such a structure, the explanation of its connection with the world of appearances is a perennial question of elemental importance. ….. Prices link the world of action and that of order. Value 'theory' is therefore indispensable for understanding how the capitalist system, largely guided by price stimuli, tends toward some kind of determinate outcome." (Heilbroner, 1988. 106 – 107.) "… the mechanisms only serve as the means by which the

[81] Use value is understood here as an abstract utility, not a concrete utility, as it is presented in Marx's *Capital*.

[82] As will become clear from further analysis, the source of surplus value is the spiritual and strong-willed efforts of society as a collective subject, associated with entrepreneurship. "According to Hegel, definitions of value cannot be obtained in the way Marx obtained them. A Hegelian adept would say about the first sections of *Capital* that definitions of one particular form of value are there taken to be universal definitions of value, that they are not universal definitions at all. He would recommend deducing universal definitions of value from definitions of rational will (the way Hegel deduces them in *The Philosophy of Right*)." (Ilyenkov, 1960, 57.)

empirical world is guided toward a certain configuration. The search for value is an inquiry into the rationale and characteristics of that configuration. As Adolph Lowe puts it: 'Suppose that a universal amnesia were to wipe out the knowledge of all present prices, would there be a rule for reestablishing them?'." (Ibid., 107 – 108.).

As has been shown, such "a rule for reestablishing all present prices" will be exchange ratios between branches that produce commodities for each other and exchange them in accordance with the solvent needs of their agents. And exchange ratios between certain branches are formed spontaneously, based on averaging the set of exchange ratios in individual exchange acts between counterparties exchanging commodities of these branches. Accordingly, market prices are formed as weighted averages of the entire set of individual prices in individual exchange acts. Under such conditions, when the solvency of each branch is conditioned by its production, each branch, in equilibrium, produces under the solvent needs of all other branches. However, the processes of formation of *individual prices* themselves (in separate exchange acts) and of *market prices* (as exchange relations between branches), which are conditioned by individual and social values, are hidden in "deep structures of economic life" (Heilbroner). But how does it happen?

2. To understand what caused the exchange ratios between commodities in the market, it is necessary to look beyond the market processes. After all, behind the market processes are production and consumption. In the market, there is only an exchange of products on an equivalent basis. (This process is mediated by their exchange for money, but in this context it does not matter). Because of market exchange, these products are transferred from producers to consumers' power, who consume them as resources to produce their products. But these consumers are also producers, with the difference that after the exchange acts, instead of the former products, they already own the resources. For the products that they have gained from each other through exchange have become resources for them, which they will consume to reproduce the same products again. These newly produced products will again be brought to the market and exchanged for all those resources that are necessary for the further production of the same products, etc. (The circle is closed). All these processes in dynamics take on the character of a closed system of intricately intertwined counter commodity flows that have a network pattern. But they are hidden. Behind the counter flows of commodities and money, there are the counter commodity flows themselves. Commodities are brought to the markets for exchange as products of production, and after the exchange they become resources for the reproduction of the same products.

The production of products by consuming resources is nothing other than the destruction of some goods for the sake of creating others, and, in a certain sense, is an "exchange" of resources for products. In the conditions of commodity production, this is the exchange of *consumed* commodities for *produced ones*. And since all subjects sell the commodities they produce and buy the commodities they consume, it ultimately turns out that in the process of consumption/production, all subjects "exchange" the *consumed* commodities for *produced* ones, and at the market, on the contrary, exchange the *produced* commodities for *consumed* ones. And this, in turn, means that if the market exchange occurs on an equivalent basis, then the "exchange" of resources for products in the process of production/consumption must also occur on an equivalent basis.

3. Each commodity is a product produced from other commodities, which are resources in relation to the produced product. Quantitative ratios between consumed resources and produced products are expressed by the *production function*. The product itself is also one of the resources in the production functions of other products, and so on. Thus, a *network pattern* of economic relationships between produced and consumed commodities is manifested in a closed system of interrelated production functions.

4. The production function of any commodity is a kind of function of "exchange ratios" between produced and consumed commodities. The production function of a commodity shows how many different other commodities must be sacrificed for a unit of the commodity produced. With the help of *expenditure coefficients*, the production function shows how many different commodities are "exchanged" for a unit of produced commodities in the production and consumer sectors. [83]

5. Ultimately, the production of products from resources is the same exchange of commodities as market exchange, with the only difference being that in the first case, the subject receives the desired product by *destroying* the consumed commodities, and in the second case, by *alienating* the sold commodities. In other words, *market prices* are the coefficients of exchange of commodities between different subjects, and *expenditure coefficients* are the coefficients of exchange between different commodities belonging to the same subject. It is as if he "exchanges" his resources for his own products. At the same time, if market prices are coefficients that regulate and balance processes within the economic system and ensure its operational closure, then expenditure coefficients regulate the interaction between the economic system and its environment, thereby maintaining the causal openness of the system. Market prices and expenditure coefficients are interconnected subsystems of a single system of *exchange coefficients*.[84] This is because the choice of technologies and consumer schemes depends on the price system similarly, as the prices themselves depend on the applied technologies and consumer schemes. Both subsystems of coefficients together provide self-regulation of the market economy, its desire for dynamic equilibrium within the system through coordinated reactions to destabilizing effects of the environment. That is, the whole logic of the self-organization of a market economy is based on a single system of commodity exchange coefficients.

6. In the process of production, the exchange of resources for products occurs in accordance with the *expenditure coefficients*. And in the market, if we ignore the "money veil", the product is exchanged for the resources necessary for its production according to *relative prices*. Ultimately, we are talking about mutually opposite processes of exchanging resources for products and products for resources. After all, it is clear that if certain amounts of different resources are consumed to produce a certain amount of a given product, then, to

[83] We remind that according to this concept, households play the same role in the consumption sector as firms in the production sector. They are not only consumers but also producers. As owners of production factors, they reproduce primary resources in the form of temporary *rights to use* of services of production factors. Therefore, in this study, the production function involves not only the production of (final and intermediate) products in the production sector, but also the reproduction of primary resources in the consumption sector. Accordingly, instead of *production coefficients*, *norms of consumption* of final products, or consumer norms, are assumed here. For brevity, it is therefore more convenient, to use the term "expenditure coefficients" as a general term that includes both production and consumption coefficients.

[84] This is due to the fact that the choice of technologies and consumer schemes depends on the price system as well as the prices themselves depend on the applied technologies and consumer schemes.

continue the production process, it is necessary to exchange this produced product on the market for the same resources that are necessary for its reproduction. Therefore, there is a certain interdependence between the coefficients of exchange of resources for products and products for resources.[85] Due to the interdependence between expenditure coefficients and relative prices, the homeostasis of the economic system is ensured, which ensures that the economy constantly strives for dynamic equilibrium despite changes in the external environment.

7. Market supply depends on production, and demand depends on consumption, but consumption itself is production on which supply depends. And this circular causality between production, supply, demand, and consumption exists not only at the macroeconomic level but for each individual subject and each branch (i.e. the economy has a fractal structure). And all these processes are intertwined in a complex network of relationships in such a way that as a result, the economy tends to balance as its optimal state. In this state, the economy produces only what is consumed and consumes only what is produced. Accordingly, market demand is equal to market supply, production is equal to consumption, and solvent needs are equal to production possibilities, because the solvency of needs is due to production possibilities.

8. From the very logic of the functioning of a market economy, it follows that as a result of the clash of interests of various sellers and buyers in the market, a competitive equilibrium is established between supply and demand, which, in turn, is transformed into an equilibrium between production and consumption. And vice versa, in the optimal mode, the equilibrium between production and consumption is the condition for the equilibrium between supply and demand. And the whole economy appears as a single system of collective actions, because of which there is a constant transformation of some goods into others in accordance with the needs of society.

9. Thus, since market exchange at relative prices is an equivalent exchange, then the exchange of consumed commodities for those produced based on expenditure coefficients must also occur on an equivalent basis. Therefore, under conditions of equilibrium, the value of commodities consumed and produced, as well as the value of commodities sold and bought, must be equal. This is the *law of value*.

[85] So if we trace the relationship between the expenditure coefficients of the production sector and the consumption sector, we will see that there is an inverse relationship between them - a decrease in one is associated with an increase in others; the same inverse relationship exists between the prices of primary resources and final products. For example, if, as a result of technological progress, technological norms in the production sector are reduced, then, firstly, the prices of final products decrease relative to the prices of primary resources, and, secondly, consumer norms in the consumption sector increase.

3.8. Profit and Savings

a) Difference between income and expenditure

1. Entrepreneurs are the owners of the Entrepreneurial production factor. The services of this factor are embodied in the products sold, and the payment for them is the profit that enters into their price. But since the prices of products are changeable and depend on market conditions, the profit is the residual value after deducting the costs of production from the income received. Market prices provide only the opportunity to receive both profit and loss. The implementation of this possibility is associated with the risk of losing the spent resources. This risk is especially great in a market economy, where the receipt of income depends on the decisions not only of the producer himself but also of other subjects. Producers are therefore required to make a strong-willed effort to provide entrepreneurial services and consumers are required to pay for these services.

Abstinence is a service that the owners of the factors of production render to society. In so doing, they accumulate the necessary resources for insurance and investment. The result of abstinence is *savings*, which are part of the income. But, in a market economy, the consumers' incomes (as sellers of primary resources) also depend not only on their decisions but also on the decisions of other subjects (producers as buyers of primary resources). They have no guarantee that in the future they will receive income sufficient to meet their future needs. Therefore, they must make savings as insurance against future expenditures. This also requires strong-willed efforts from consumers, the result of which is also excess income over expenditures, i.e. savings. The consumers' efforts must also be paid for by the producers (when buying primary inputs), just as the consumers pay for the producers' efforts (when buying final products). Therefore, it turns out that not only do consumers pay for producers' *profits* but also producers pay for consumers' savings.

2. *Profits* and *savings* represent the net income of economic subjects, the difference between the income and expenditures that they receive through entrepreneurship and abstinence. Profit is the difference between income and expenditure of producers, and savings is the difference between income and expenditure of consumers.[86] "Alternation of incomes and expenses takes place both in production sector and in consumption sector. Incomes and expenses are the same reflective concepts as production and consumption, products and resources, utility and costs. Incomes of producers are expenses of consumers, and expenses of producers are incomes of consumers. Accordingly the difference between incomes and expenses accepts mirror opposite forms for them - profit and saving. Just for this reason profit and saving are inherently interconnected. So far as incomes of one are expenses of others and vice versa, then profit and saving cannot be independent amounts." (Leiashvily, 2012, 68) That is why gross profit and gross savings are interrelated. Changes in the exchange proportions (i.e., relative prices) between final products and primary resources have the opposite effect on profits and savings. Naturally, gross profit and gross savings should be equal under equilibrium prices.

[86] At the same time, entrepreneurs, being the subjects of the production sector, are also the owners of their Entrepreneurial abilities as a production factor.

3. As a *producer*, the subject must carry out expenditures in such a way that, they result in income exceeding its expenditures, i.e., receives profit. It requires *entrepreneurial effort*. But as a *consumer*, the subject must spend out of his income in such a way that, as a result, there remains a certain surplus of income, i.e. savings. This requires *abstinence* and *thriftiness*.

Both society as a whole and each individual subject are both producers and consumers. Therefore, in both capacities they simultaneously perform the functions of both entrepreneur and saver. The producer is not only an entrepreneur, but also a "saver" since he does not spend the income from production entirely on continuing production, but saves part of the income. Precisely these "savings" is the withdrawn profit. And when deciding on expenditures, the producer takes into account not only profits expected from future income but also what "savings" will remain from previous income.

Consumers are also not only savers, but, in a sense, also "entrepreneurs", because consumption is also risky. Thus, when making decisions about expenditures and savings, it is necessary to take into account the risks associated with the uncertainty of the future and the possible decline in future incomes. Therefore, savings are needed to insure the risks of a possible forced decline of consumption standards in the future. Investing in savings also requires them to take the entrepreneurial risk.

Therefore, all economic subjects make every decision regarding expenditures, taking into account both the received and expected incomes. The decision is therefore taken from the perspective of both the saver and the entrepreneur.

4. I*n the usual sense*, producers make profits, consumers make savings, and there seems to be nothing in common between them. But in a more profound sense, there is both identity and difference between profit and savings, as well as between other dialectically interconnected categories - production and consumption, income and expenditures , products and resources, utility and costs, etc. Profit and savings are *identical* in that both are an excess of income over expenditures but *differ* depending on whether expenditure generate income, or are generated by income.

In general, the excess of expected income over current expenditure is their profit, and the excess of already earned income over current expenditure is savings. And in the alternation of income and expenditure, it depends on the subject’s position whether the difference between income and expenditure is perceived by them as profit, or as savings. Consequently, it depends on the subject how he relates to his activity - as to production, or as to consumption. It depends on whether he correlates income with the expenses that preceded them and *generated them*, or, conversely, with the expenses that followed them and were *caused by them*. Accordingly, the profit and savings of the same subject (as the difference between his income and expenditures) can be equal or different in value. Profit can be both more and less than savings. It depends on the decisions made by the subject and the results of his actions.

b) Statement of the problem

1. In a market economy, commodities are produced by consuming commodities, and therefore, some values are created by destroying others. These are recursive processes. Therefore, in conditions of equilibrium, during a given period of time, what is produced is consumed, and what is consumed is produced. Accordingly, the same value of goods is created, which is destroyed. And since all subjects produce goods for each other and then buy them from each other, then, first, the incomes of some subjects must be equal to the expenditures of others, and second, the incomes of the subjects themselves must be equal to their expenditures. But with such an understanding of economic processes, there is no room for profit and savings, which implies that during the considered period of time, the income of all economic agents should be higher than their expenditures.

2. Also at the macro level, we get a closed system since final products are produced from primary resources, and primary resources from final products. And as has been shown, the total value created in the production sector and that created in the consumption sector are equal. However, the existence of profit implies that in the production sector, the value of goods produced is greater than the value of goods consumed,[87] and saving implies that, in the consumption sector, the value of goods consumed is less than the value of goods produced. It turns out that in both sectors, in conditions of equilibrium, surpluses of value strangely – more is produced than is consumed (or less is consumed than is produced). And since the commodities produced are sold, and the commodities consumed are bought, it turns out that the value of commodities sold is greater than the value of commodities bought in both sectors. Is this possible?

3. Ultimately, it turns out that, according to the equilibrium conditions, in the same period, production is equal to consumption, demand is equal to supply, sales are equal to purchases, incomes are equal to expenditures, and yet everyone receives more income than they spend and receive a surplus. This is clearly a logical contradiction. At the same time, this surplus of income over expenditures is obtained by the ordinary sale of commodities in the market. This implies that each subject must sell some surplus of commodities, over the amount whose income covers the cost of producing the entire volume of commodities sold. All this leads to arguments by analogy with the logic of Marx's *theories of surplus value and surplus product*.[88]

[87] To avoid double counting, we do not consider the production and consumption of intermediate products separately, because the cost of final products already takes into account the cost of intermediate products, which is decomposed into the cost of the same primary resources.

[88] Marx, according to his theory of surplus value, used the terms: necessary and surplus value, necessary and surplus product, necessary and surplus labor, necessary and surplus labor time. "… Sraffa's work … provided a basis for a definitive demonstration that the theoretical analysis of wages, profits, and prices, within a surplus approach, was entirely independent of any 'labour theory of value' and, indeed, that any labour theory is necessarily a barrier to the development of a surplus-based theory." (Steadman, 1981, 12-13). "… a surplus approach to profits and prices has absolutely no need of any 'labour theory of value'" (Ibid,16.)

c) Surplus products and saved resources

1. First of all, let's try to look beyond the “mone veil” and consider the processes in terms of the barter economy. The fact is that these surpluses of value are embodied in the products produced by different sectors. The products of each sector are resources for the other. And since final products are produced by the consumption of primary resources, and primary resources by the consumption of final products, then the excess value embodied in surplus products and saved resources is destroyed and created along with the consumption and production of these products and resources. Therefore, the appearance of these surpluses of value simultaneously in both sectors of the economy is not only impossible, but, on the contrary, is a necessary condition for maintaining its integrity.

The exchange ratios (relative prices) in the market are set so that producers exchange only *part* of the final product for the primary resources needed to produce the *entire* final product. That is, the value of the primary resources spent by producers in the production sector is equal to the value of only one part of the final product produced by these resources. That part of produced product, which is exchanged for resources necessary for reproduction of whole product, is a *necessary product*. The value of the rest part of created product is *surplus product*.

Similarly, only a part of primary resources is exchanged for final products required for reproduction of these resources (that is, to satisfy the owners' current living needs). This is the *necessary resource*. The rest part of resources is the *surplus* or *saved resource*, the sale of which generates owners' saving and which is the reward for his abstention and frugality. The more the owners' abstention is the more resources are saved from their current consumption. That‘s why the total amount of reproduced resources depends only on the amount of production factors, which are in owners' possession, but not on the volume of their consumption.[89]

2. In a money economy, the exchange between primary resources and final products occurs not in the form of barter, but through acts of sale and purchase in two different markets - the market for primary resources and the market for final products. These markets are interconnected by money flows. Therefore, the exchange between primary resources and final products takes the following form in a money economy. Income from the sale of the *necessary product* pays for the primary resources necessary for the production of all products. And the income from the sale of the surplus product is Profit, which pays for entrepreneurial services. Thus, from the profit created by entrepreneurs (as producers) in the production sector, their income (as consumers) in the consumption sector is formed.

3. Incomes from the sale of the *necessary* primary resources are paid for the final products for the current consumption of the owners of production factors and, therefore, are necessary for the reproduction of primary resources. Incomes from the sale of *saved* primary

[89] At the same time, surplus products are *surplus* only from the point of view of the entrepreneurs themselves, who, with their own efforts, produce more products than are necessary to pay for the resources consumed. But from the point of view of the whole economy, surplus products are just as *necessary* as necessary products. Similarly, saved resources are *saved* only from the point of view of consumers who, through abstinence, have saved them from current consumption. But from the point of view of the entire economy, they are as *necessary* as necessary resources.

resources form monetary savings. Thus, profit and savings, as the excess of income over expenses, are the monetary expression of the value of the surplus product and saved resources.

4. Both profit and savings are residual values that appear at the end of the period under consideration. Profit is the part of the income from the sale of the produced product, which remains after deducting the expenditures for their production. And savings, accordingly, is the part of the income from the sale of primary resources that remains after deducting expenditures for consumption. Since profits and savings are formed at the end of the period under consideration, naturally, as monetary resources, they cannot be used in the same period in which they were received as residual values. Their use is possible only in subsequent periods. Similarly, the surplus products and the saved resources, the income from the sale of which are profits and savings, are produced in one period and consumed in another. However, it is impossible in the markets to distinguish necessary products from surplus products, or necessary resources from those saved. The surplus products are sold at the same prices as the necessary products, just as the saved resources are sold at the same prices as the necessary resources.

5. After all the above, the above definitions of profit, savings, surplus product and saved resource must be supplemented with the following provisions:

1) It is necessary to distinguish the received profit from the withdrawn profit. The *received profit* is equal to the difference between the income from production and the those expenditures due to which this income is received. This profit is the net income of the entrepreneur as a producer and represents the payment for the entrepreneurial services he renders to society. And the *withdrawn profit* is that part of the profit received, which he withdraws from the sector of production and uses for personal consumption in the consumption sector. The difference between the received and withdrawn profits is used in the production sector to pay income taxes, interest payments, depreciation,[90] and other purposes necessary to continue the production process.

The profit withdrawn is the personal income of the entrepreneur *as a consumer*. Like the income of other consumers, it consists of consumption and savings. At that, the entrepreneur's personal consumption, as will be shown below, is his investment in his human capital. As for his personal savings, the source of their formation, as usual, is the entrepreneur's abstention from personal consumption. By analogy with profit, part of the entrepreneur's personal savings is withdrawn from the consumption sector. After the transformation into credit resources, the withdrawn part of the personal savings of entrepreneurs, together with the savings of other owners in the consumption sector, is invested in the production of physical capital in the production sector.

2) The surplus product from the necessary product, as well as the saved resource from the necessary resource, differ in that they are bought not with current income but with previously received ones. Simplifying somewhat,[91] we can say that the surplus product is invested mainly in *human capital*, and the surplus resource is mainly invested in *physical*

[90] Further clarifications regarding depreciation charges will be made below.

[91] At this stage, simplification is done for the convenience of reading the text. It will be shown below that part of the surplus product (profit) is also invested in physical capital, and part of the saved resource (savings) is invested in human capital.

capital. Considering the above, the commodity and money flow diagrams below will make the above easier to understand.

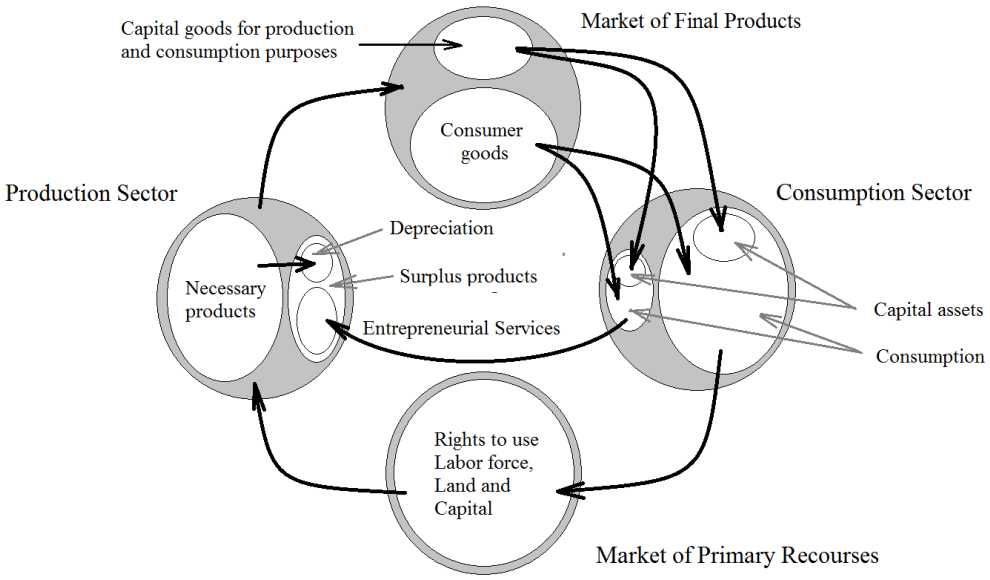

Fig. 1. Commodity flows

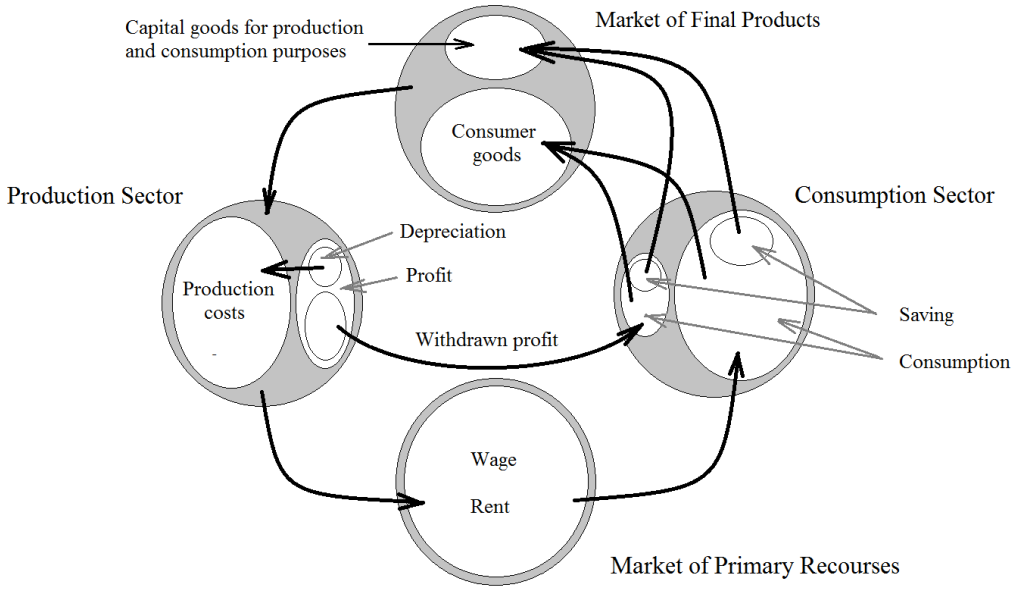

Fig. 2. Money flows

3.9. Capital and current goods

a) Conditionality of classification

1. Different goods require different times for production and consumption. In order to avoid deficits and surpluses in the economy, the rates of production and consumption of various goods must be synchronized. All goods can be conditionally divided into capital and current goods depending on the time required for their production and consumption.

Goods that are produced and consumed within one year can conditionally be classified as current goods, and those that require more time for this – as capital or investment goods. Moreover, both capital and current goods can have both production and consumer purposes. Capital goods and current goods are relative concepts. The division of the commodity world into those and others depends on the time interval conventionally taken as a unit of reference. With an increase in this time interval, many goods that were previously considered investment goods would in the category of current goods. Still, if this time interval is shortened, on the contrary, a number of current goods will end up in the category of investment goods.

2. The production of capital goods takes a long time. To be able to produce capital goods, it is necessary to save resources from current consumption and invest them in the production of capital goods.[92] According to the *logic of barter relations*, during the entire period, when capital goods are produced, the resources invested in their production are consumed in debt. There are credit-debt relations. Therefore, until the completion of production and the sale of capital goods, their producers do not have to pay for these resources. Payment for these resources will occur after the sale of the produced capital goods.

But according to the *logic of commodity-money relations*, both the resources for producing capital goods, and the capital goods themselves are bought on the market for money, just like all other commodities. At the same time, credit and debt relations are transferred from the sphere of pure commodity relations to the sphere of purely monetary relations. *Commodity credit* is replaced by *money credit*. Accordingly, resources for the production of capital goods are generally bought by money credits, which must be repaid from future income expected from the sale of these capital goods.

3. If during the period under consideration, the good is not consumed completely and does not disappear along with consumption, then we can only talk about its *wearout* and its *services*. As they wearout, capital goods need to be restored. The consumption of capital goods themselves and the consumption of its services are not the same. The *services* of

[92] "Thus, investments are carried out due to saved resources and surplus products. The first are invested into the physical capital, the second - into the human capital." (Leiashvily, 2012, 60) As a result of investments, the creation of investment goods and the restoration and growth of physical and human capital is carried out. And over time, natural capital will also have to be restored, so more and more investments have to be made in order to preserve it. "Investment into the physical and human capital is a process being beyond circulation of necessary product and necessary resource. Investment assumes other form of relationships between consumer and producer, rather than current production and consumption73. Instead of exchange (buying and selling), credit relations … are here implied. … If someone one invests, it means that someone another consumes on debt. One is impossible without another. They represent two aspects of the same redistributions in time of production and consumption possibilities." (Ibid.)

capital disappear completely in the very process of consumption. But *capital* itself in the consumption process wears out gradually over a long period, covering a number of conditionally accepted units of time. Once capital is completely worn out, it must be restored. To restore it, a certain part of the produced capital goods must be used to replace depreciated capital, and the other part, for a net increase in capital. It follows, too, that the investment of resources in the *recovery* of capital must be distinguished from their investment in *pure growth* of capital. Accordingly, gross investment consists of the *depreciation* and *net investment*.

b) Final and intermediate capital goods

1. As noted, unlike final products and primary resources, intermediate products are consumed in the same sector in which they are produced.[93] Like final products, intermediate products can be both capital and current goods. Both capital and current intermediate goods are produced and consumed in the same sector. But the difference between them is that intermediate current goods are consumed in the *same* period in which they are produced, while intermediate capital goods are produced and consumed in *different* periods of time. So, both capital and current intermediate goods can be both for production and consumer purposes. According to this understanding, capital produced in a sector of production to replace depreciated capital in the same sector is an intermediate product, and its depreciation is intermediate consumption.

2. When purchasing Capital for production purposes, the owners invest their money savings in order to receive *Rent* as factor income from the sale of rights to use the services of Capital. Entrepreneurs buy these rights and consume these services as the primary resources. But the consumption of these services is impossible without the consumption of capital itself, which wears out in this process. However, entrepreneurs pay nothing to the owners of capital for this wearout. They pay the Rent only for the rights to use. It turns out that the capital itself, they *consume in debt*. But ultimately, the entrepreneur must at his own expense compensate the owner for this wearout and replace the wornout capital with a new one.[94] To this end, in parallel with the wearing out of capital, entrepreneurs make money savings (depreciation deductions) from the income received in order to replace capital after it wears out. Thus, it turns out that, in contrast to pure investments, which are carried out by the *savings* of capital owners, depreciation is carried out from the entrepreneurs' *profits*.

[93] In addition to circulating goods, final products include capital goods produced for a net increase in capital (but not to replace worn-out capital). Moreover, capital goods can be used both for production and consumption purposes. Therefore, it turns out that, as part of the final products, capital goods for production purposes are produced in the production sector but are bought and used by the owners of capital in the consumption sector. It is understood that the owners who bought these capital goods use them as an income-generating factor of production. They sell the right to use of their services to entrepreneurs as a primary resource. In other words, it is about using capital in the economic sense to generate factor income.

[94] This refers to the relationship between the entrepreneur's and the owner's *functions*. However, in reality, the entrepreneur himself may also be the owner of capital. In this case, the logic of the relationship of the functions performed by him remains in force. If the entrepreneur himself is the owner, then he must compensate for this depreciation to himself. Otherwise, his property will decrease.

3. It should be emphasized that depreciation is part of the profit and not part of the production cost, which is included in small increments in the cost of products for a long time. Depreciation deductions are purely financial procedures. It has very little to do with the actual loss of value of capital as it wears out. The choice of norms and methods for depreciation deductions does not depend on the actual wearing of capital. It depends on the economic policy of the state.[95] The depreciation fund is the saved part of the production income of entrepreneurs, which they spend not for current production expenditures, but for the future replacement of wornout physical capital. Therefore, depreciation deductions should not be understood as an extended write-off of previously incurred expenses. In other words, they are not production costs. According to this interpretation, the depreciation deduction is the saved part of the profit received, which is not taxed and is not withdrawn to the consumption sector for the personal expenses of entrepreneurs.

Something similar happens when the owners of production factors, as consumers, save part of their income to replace worn-out physical consumer capital or invest in human capital, which also wears out and also needs to be restored.[96]

4. The capital goods needed to replace depreciated capital are intermediate products. Therefore, depreciation should not be included in the GDP. Such a division of the produced product into Gross and Net Product results from a misunderstanding of depreciation. The indicator that the System of National Accounts refers to Net Product is, in essence, Gross Product. And the Gross Product indicator, in the form it is considered in the SNA, is a false indicator obtained due to an incorrect interpretation of economic processes.

In the process of producing depreciation goods, factor incomes are created, to which, ultimately, their price is reduced. But these factor incomes are already taken into account in those factor incomes on which are decomposed the prices of final products in the production of which these depreciation goods took part. Therefore, introducing depreciation into the Gross Product is equivalent to introducing intermediate products along with final products. This creates a double count and inflates the real volume of the product produced.

5. *Food for thought:* "According to Smith the value of each individual product is equal to the sum of incomes consisting of wage, profit and rent. He has not acknowledged the capital expenditures as the fourth component of price because they match the value of previously created products of labor, which in turn is divided into the same three elements as the final product is. Smith's position is quite reasonable: the inclusion of capital expenditures into the price of all goods would lead to the fact that one and the same product would enter the yearly product of society repeatedly. By this approach, Smith avoids double counting in a measurement of annual product. But Smith argues that if the value of each individual

[95] There has always been controversy in understanding depreciation. There are two meaningful characteristics of depreciation - (1) the depreciation of property and (2) the formation of a fund for its restoration. The uniform distribution of depreciation over periods does not correspond to real depreciation processes, because the older the capital, the faster it wears out. But it is impossible to determine the correspondence of real depreciation to depreciation rates. In addition, any depreciation rate assumes the possibility of operating the object after its full normative wear. By setting the depreciation rate or useful life, the procedure for calculating and using depreciation charges, the state regulates the pace and nature of the reproduction process in branches.

[96] This refers to the upbringing, health, and training of a new generation, which should replace disabled ("worn out") human capital, leaving the labor force due to age or illness.

commodity falls into incomes, this should apply to the whole mass of commodities, composing the annual product of each country. Therefore, the value of national product should also be equal to the sum of incomes consisting of wage, profit and rent. But the core of the problem is that the part of annual product produced in the country is the capital goods required to replace depreciated capital. For the society their value is the costs required for production of annual product. It turns out that the cost of each product individually consists only of incomes, but the value of entire national product, which consists of these products, in addition to incomes, includes also the value of depreciated capital. But after all within the prices of individual products the value of depreciated capital has already been decomposed into incomes. Why does it occur again in the national product? This enigma remains enigma and generates a number of problems. The value of final product turns out to be greater than the amount of incomes. It turns out that the aggregate supply is greater than the aggregate demand; that the entire product cannot be sold inside the country. But economic reproduction is possible only under the condition that all goods will be sold, all the means of production and consumption goods - recovered. Consequently, the crises are inevitable, etc. A. Smith cuts down this "Gordian knot" and just gets rid of the problem by introduction of concepts of "gross" and "net" products. But from a purely theoretical standpoint - this is incorrect. Here clearly exists ambiguity, which remains so up to this day." (Leiashvily, 2015, 89-90.)

This problem has not only purely theoretical but also practical significance. Here is what is stated in the System of National Accounts (SNA 2008):

> *2.141. In principle, the concept of value added should exclude the allowance for consumption of fixed capital. The latter, in effect, is not newly created value, but a reduction in the value of previously created fixed assets when they are used up in the production process. Thus, theoretically, value added is a net concept. This conclusion applies to domestic product as well; theoretically, domestic product should be a net concept. Net domestic product (NDP) is obtained by deducting the consumption of fixed capital from GDP.*
>
> *2.142. However, gross measures of product and income are commonly used for various reasons. The depreciation of fixed assets as calculated in business accounting does not generally meet the requirements of the SNA. … So GDP is broadly used even if it is, on a conceptual basis, economically inferior to NDP.*
>
> *2.144. By deducting the consumption of fixed capital from GNI, net national income (NNI) is obtained. The remarks above about the conceptual relevance of the net concept in case of product apply even more strongly to national income. (SNA 2008, 2009, 34.)*

Since the depreciation of capital in production sector is paid by depreciation deductions from profit, then the income of producers of depreciation capital is already taken into account in gross profit (hence, in the NNI indicator). Therefore, the GNI indicator is a false indicator that overestimates the national income indicator due to double counting of income. "So, division of national product and national income into "gross" and "net" cannot be considered as a solution. On the contrary, such division essentially hides the real problem, creates illusion of its solution and thus conserves the problem. Smith deviates from solving of the problem and leaves this enigma unsolved. Since the days of Smith a large number of

economic works is devoted to this problem, but it still remains unsolved … . And it cannot be solved as long as economic theory reaches a clear understanding of how the economic reproduction is performed." (Leiashvily, 2015, 90.)

c) Investment in human capital

1. Production of a product requires not only physical but also human capital. These are knowledge, experience, qualifications, health, social connections, etc., which are necessary for a person to be able to carry out economic activity. Entrepreneurial ability is also related to human capital. For human capital, the usual depreciation approach applies. Forming of this capital requires investment in improving the level and quality of human life. For the functioning of human capital, the consumption of final products is necessary. For knowledge and ability exist only in a living person. But over time, this capital "wears out", knowledge and experience become obsolete, a person loses his ability to work because of illness and leaves the labor force upon reaching retirement age. Accordingly, it is necessary to renew the knowledge and experience, to restore health, raise and educate the younger generation, etc. All this requires the economic costs and implies consumption of final products by above the necessary costs for current consumption of owners of human capital.17 It is necessary to accumulate funds for education, sickness, to create the insurance and pension funds, etc. This means - to make saving from incomes and, therefore, to limit the current consumption.

2. Personal consumption of entrepreneurs is "consumption in debt to himself." In this regard, the remark of K. Marx in a letter to F. Engels (dated June 23, 1868) is interesting. Marx quotes A. Smith: "'His profit, *besides, is his revenue* the proper fund of his subsistence. As, while he is preparing and bringing the goods to market, he advances to his workmen their wages, or their subsistence, *so he advances to himself*, in the same manner, his own subsistence, which is generally suitable to the *profit* which he may reasonably expect from the sale of his goods. Unless they yield him this profit, therefore, they do not repay him what they may very properly be said to have cost him'." Further, Marx writes: "This second manner of pressing the profit into the **prime cost** — because already consumed — is really fine." (Marx, 1988, 46)

The profit of the current period is the residual value. Its receipt is associated with risk and is possible only at the end of this period. Therefore, in the current period, the entrepreneur, as a consumer, can pay for personal consumption expenses only from previously received profits (withdrawn from the production sector) as his personal income. In other words, he invests his monetary resources in the reproduction of his life and capacity as an entrepreneur, i.e., he invests in the reproduction of his human capital. Without such investments in his consumption, he cannot fulfill the entrepreneurial function.

3. The surplus product is invested also in education, science, culture, healthcare, security, law and order, etc. These investments into the human capital create conditions for normal functioning of not only economy but also a society as a whole. Investments in human

capital are financed both by individual subjects from their savings and by the state from the budget formed by taxation as a kind of "mandatory savings".[97]

3.10. Optimality and its criteria

1. During a given period of time, society has a certain set of actual needs and a certain amount of primary resources needed to satisfy them (by producing final products). Society must somehow allocate resources to meet its needs. Since resources are limited relative to existing needs, if some needs are met more, then others will have to be met less. Satisfaction of various needs depends on each other.

2. As already mentioned, *costs* are an *extensive* magnitude and are subject to the law of additivity, while *utility*, as an *intensive* magnitude, is not subject to this law. This circumstance determines the difference in the nature of the dependence of utility and cost on the quantity of goods. For example, the cost per unit of a commodity does not depend on the quantity of the commodity produced. [98] Therefore, along with the quantity of output produced, costs increase or decrease proportionally. That is, between quantity and costs, there is, firstly, a *direct* and, secondly, a *linear* relationship. Unlike costs, the utility of not only the *entire output* but also *each unit* of the commodity changes with the change in the quantity of a commodity produced. In addition, the relationship between quantity and utility is, firstly, *inverse* (the greater the quantity, the less the utility of a unit of commodity, and vice versa) and, secondly, *non-linear*. Accordingly, when the branch's output changes output costs and utility change in opposite directions. Costs increase or decrease extensively with quantity, while utility changes intensively in the opposite direction. At the same time, the *cost* of each unit of the commodity does *not change*, but its *utility changes*.

3. But the even-utility of costs is only a *global criterion* of optimality, which contributes to the optimal *allocation* of available resources between branches. However, their optimal allocation is not enough for the optimal use of resources. After all, the even-utility of costs does not rule out the possibility of equally low cost-effectiveness in all branches. Therefore, it is also necessary that efficient technologies be used and that resources be *used* economically. For, obtaining the maximum of the total utility of the products with the available resources implies that this utility is obtained at the minimum cost. One is impossible without the other. Therefore, when making concrete economic decisions, the subjects are guided by a *local* optimality criterion, which implies not the equal utility of costs, but, on the contrary, *maximum utility* with a *minimum of costs*. In accordance with the local optimality criterion, the subject not only seeks to get the *maximum utility per unit of cost* and, thus, produce the most deficit products with the available resources. He also strives

[97] The fact that taxes are paid out of income, which consists only of consumption and saving, means that taxes, by definition, are already paid out of saving as the non-consumable part of income. As it was shown, both profit and savings are the difference between income and expenses; therefore, there is a non-consumable part of the incomeof both producers and consumers. It follows that only the savings of consumers and the profits of producers can be the source of tax payments.

[98] We do not take into account the *Economies of Scale*, because it begins to manifest only at significant changes in the volume of production, so it cannot participate in the «fine-tuning» of the economy to optimize it.

to realize the *minimum cost per unit of utility* and, consequently, to use efficient technologies in producing these products, save resources and eliminate losses.

All subjects strive to maximize incomes and minimize expenditures according to *intra-branch* competition, guided by the *local* optimality criterion. To this end, they strive to produce the most useful products for society with the minimum consumption of socially useful resources. But, thanks to *inter-branch* competition, they tend to redistribute their resources, withdraw them from less profitable branches, and invest in more profitable ones. Thus, the tendency of the economy to achieve even-utility of costs is realized in accordance with the *global* criterion of optimality.

4. At the *microeconomic level*, according to the local optimality criterion, subjects strive to maximize utility and minimize costs. But this is manifested not only in monetary form, not only in the fact that producers strive to maximize profits, and consumers - to maximize savings. But this is manifested also in the fact that the former seek to get maximum profit by minimal effort and risk, while the latter seek to get maximum savings with minimal abstinence (that is, with the maximum possible satisfaction of needs).[99] According to the global optimality criterion, there is an inter-branch redistribution of resources in search of more profitable branches at the *macroeconomic level*. This gives rise to a tendency to equalize the profit rate between branches, to equalize production and consumption, and equalize supply and demand.

Accordingly, in the first case, optimization is reduced to finding an *extremum,* the maximum or minimum value of the extremizable function.[100] And in the second case, optimization comes down to finding an *essential relationship* between the necessary parts of the whole and the formation of the *integrity* of the economy as a negative unity of branches.[101]

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[99] According to the *local criterion* of optimality, entrepreneurs seek to invest resources in those branches in which production is associated with low risk and high profitability and goods are in high demand. And this causes 1) an inter-branch redistribution of resources and a reduction in the production of excess goods and an expansion in the production of scarce goods; 2) equalization of profit rates between industries, 3) achievement of even-utility of costs, and even-scarcity of goods produced in the economy as a whole. All this leads to optimizing the production of products in the economy per the *global* criterion of optimality.

And consumers, as owners of production factors, according to the *local criterion*, strive to maximize savings with minimal abstention. But this means they abstain from satisfying the least significant needs and meeting all the necessary ones. As a result, maximum savings are achieved by minimum abstinence while maximizing the satisfaction of needs. But in order to increase income, the owners will seek to possess the most scarce production factors and sell their services to those producers who need them most and will buy at the highest prices. All this leads to optimizing of resource consumption in the economy per the *global criterion* of optimality.

[100] "... the very concept of "optimal" is divided into two: "optimal in the narrow sense" and "optimal in the broad sense". (Yatskevich, 1990, 27) "Optimal in the narrow sense implies an extremum and movement towards it. ... Optimality in a broad sense means the necessary belonging (inalienability) of some element to the system. Without it, the latter cannot be wholeness. Each of its elements assumes all the others, and each element is assumed by all others. Therefore, optimization in a broad sense is the search for not just some element-solution, but the search for wholeness .... Such optimization is essentially based on the totality of system-forming relations. The presence of any extremum here is of secondary importance and does not determine anything by itself." (Ibid., 30)

[101] "The problem that determines the heuristic possibilities of the principle of integrity is the problem of substantiating wholeness in each particular case. This principle significantly complements the systematic approach, since it aims to find an essential relationship, the essence, the absolute. It is noted that one and the same object can have a different set of models, but the most adequate of them will be the one that reflects the basis of the wholeness of the phenomenon under consideration as the leading moment. The concept of "whole"

5. As already noted, the incomes of producers (entrepreneurs in the production sector) are the expenditures of consumers (owners in the consumption sector), and vice versa, the expenditures of the former are the incomes of the latter, and the difference between incomes and expenditures, in one case takes the form of profit and, in the other, the form of savings. In the exchange of their commodities, subjects pay each other either profit or savings, depending on whether they buy final products or primary resources. For, profit and savings are price components, respectively, of the final product and the primary resource. Therefore, although, in the process of production and consumption of commodities, subjects create profits (in the production sector) and savings (in the consumption sector), but in the process of exchanging commodities they pay each other for their profits and savings. Ultimately, in equilibrium, the profits of some pay for the savings of others, and vice versa. Therefore, as a result of the exchange, gross profit and gross saving mutually balance each other.

6. If the economy is monopolized and inter-branch redistribution of resources is suppressed, it means that the *global* criterion of optimality is ignored. In such a case, the dominance of the local criterion inevitably generates a tendency toward increase *inequality*. Large corporations thrive by suppressing small and medium-sized businesses. The rich become richer, and the poor get poorer.[102] If the *local* optimality criterion is ignored, the economy will gradually *decline* due to the low efficiency of resource use in the entire system.

7. Local and global optimality criteria only in unity form a general optimality criterion, which is the Pareto criterion that provides the maximum total utility with a minimum of total costs already at the level of the entire system. Moreover, such a state of the economy is achieved only under conditions of equality of total utility and total costs, which, as has been shown, logically follows from the interaction between the production and the consumption sectors. And only in this case, all branches begin to produce commodities in accordance with the solvent needs of all other branches. As a result, such an optimal system of exchange ratios or equilibrium relative prices is formed, in which neither deficits nor excesses arise in the market.

3.11. Total cost

1. Primary resources and final products are different commodities and are sold in different markets. However, their total values are not *different parts* of the *single* total value of all commodities. The total value of all commodities should be understood not as a whole consisting of these two parts, but as a unity of opposites – of the total value of primary

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is directly related to the optimal choice problem. Let set A be a concrete whole, then the set of its constituent parts and the structure of their relations are also concrete. ... In this sense, choosing the optimal means providing, creating, constructing the wholeness, fulfilling the creative function."(Yatskevich, 1990, 67) "The whole has all the features of the absolute - it is absolutely whole, since it contains all that and only that which is necessary, and by this exhaustively determines itself." (Ibid., 66-67).

[102] We proceed from the fact that, in contrast to the concept of *welfare*, the concepts of *wealth* and *poverty* are *relative concepts*. Welfare is measured by the level of consumption and satisfaction of needs. While regardless of the level of well-being, the rich are rich only *relative* to the poor, and the poor are poor only *relative* to the rich.

resources and of final products.[103] Their total values do not have a specific magnitude in the usual sense. They cannot change in different phases of the economic cycle and at different levels of economic development. Each of them is always associated not with a certain magnitude but with wholeness as with 100% or 1. As such, they do not *limit* each other, but infinitely *interact* with each other.

2. Since each of these total values is reproduced by destroying the other side, they are, firstly, mutually exclusive of each other, and, secondly, for the same reason, they mutually *presuppose* each other. They cannot finally *unite*, since the creation of each of them is impossible without the destruction of the opposite side. But also, they cannot be finally *separated* since for the creation of each side is impossible without the opposite side. They are a unity of mutually exclusive opposites. For ,each side both supposes and denies the other side, at the same time, relates to the other side both positively and negatively, that is, contradicts itself. This is the dialectical contradiction that drives the economy.

3. Since final products are created from primary resources and primary resources from final products, in the process of which they are sacrificed to each other, the total value of neither of them can be neither more nor less than the total value of the other side. At the same time, both of these totalities are qualitatively homogeneous substances, structured and differentiated within themselves only by the magnitude of their constituent components. Each of them consists of many different and variable in size, but qualitatively homogeneous parts - the values of individual commodities (respectively, primary resources and final products). However, as a result of incessant changes in the relative magnitudes of values of individual commodities, only the *states* of each of them change, but do not affect them as wholenesses. The whole always remains whole, no matter how its parts change. For the whole is not the *sum* of its parts but their *unity*, and as such, from the point of view of quantitative certainty, the whole is always associated with a *unit* or *100%*, and its parts with *parts of units or percentages*. The total value of both primary resources and final products is the *negative unity (Hegel)* of the values of individual commodities. It means that within these totalities, an increase in the value of some commodities is possible only at the expense of a decrease in the value of other commodities.

4. To be *definite*, a magnitude must be limited. The limitation of a magnitude is revealed only as a result of comparison with other magnitudes. It must be related and commensurate with them. But although the subject (individual or society) can commensurate the value of particular goods belonging to him, he cannot commensurate the total value of all his goods with anything. Value is the "force of attraction" of an object to a subject conditioned by his needs for the objects that he possesses. This force can be more or less intense. Accordingly, the value attitude towards some goods can be more intense than towards others. Thanks to commensuration, the magnitudes of the values of various goods acquire certainty *relative to each other*, because, correlating with each other, they *limit* each other. But all together they form a unified whole as a total value, which is not limited by anything from the outside and cannot be limited because it is a system of mutual correlations closed in itself. It is a subjective world from which it is impossible to go outside, and into

[103] The values of intermediate products and resources are not taken into account separately because they themselves consist of the values of primary resources and final products.

which it is impossible to penetrate from the outside. This world is unique and, in Hegel's terms represents a *Being-for-itself* and as such is *true infinity*. For a better understanding of the general context in which the idea of total value should be adequately interpreted, below is a quote from Hegel, in which he characterizes consciousness with the help of the category of "Being-for-itself".

> *"In **representing** to itself an intended object which it feels, or intuits, and so forth, consciousness already contains in itself as consciousness the determination of being-for-itself; that is, it has **in it** the content of that object, which is thus an **idealization**; even as it intuits, or in general becomes involved in the negative of itself, in the other, it **abides with itself**. Being-for-itself is the polemical, negative relating to the limiting other and, through this negation of the other, is being-reflected-within-itself – even though, **side by side** with this immanent turning back of consciousness and the ideality of its object, the **reality** of this object is **also** retained, for the object is **at the same time** known as an external existence. Consciousness is thus **phenomenal**, or it is this dualism: on the one side, it knows an external object which is other than it; on the other side, it is for-itself, has this intended object in it as idealized,…"(Hegel, 2010, 127) "The object is my idea: I am aware of the object as mine; and thus in it I am aware of me. The formula of self-consciousness is I = I : — abstract freedom, pure 'ideality.' In so far it lacks 'reality': for as it is its own object, there is strictly speaking no object, because there is no distinction between it and the object." (Hegel, 1894, 53) "We have the most obvious example of being-for-itself in the* I. *To begin with, qua existing we know ourselves to be distinct from other existents and related to them. Furthermore, we know this expanse of existence to be at the same time sharpened, so to speak, into the simple form of being-for-itself. Saying 'I' is the expression of an infinite and at the same time a negative relation to oneself. It can be said that human beings distinguish themselves from animals and hence, from nature generally by knowing themselves [in each case] as an I." (Hegel, 2010a, 152-153)*

Consciousness always moves only within itself, passing from one concept to another, from one representation to another, etc. Its ideas and representations are the referents of external reality. They are only signs and symbols denoting particular objects and processes of objective reality. With any attempt of consciousness to go beyond its boundaries, it again finds itself in itself. It therefore follows that a value relation can exist only between the *"Ego"* of the subject and his own representations of the objects of the external world.[104] Only the subject himself is aware of his values, can commensurate them, sacrifice some value to others, and so on. But, since this is the case, the total value, as a set of subjective relations, is not externally limited by any other values and, therefore, cannot have a certain value.

5. The subject cannot see the boundaries of his world of values because he cannot go beyond the limits of his consciousness.[105] For him, the totality of all values is something infinite and unlimited, since there is a subjective relation of his "Ego" to the world of his own

[104] On the basis of those values, he makes all the decisions. But as the master of his body, as of real object, he forces his body to interact with other objects in the real world. As a result of this interaction, the reality is changed and adjusted to his goals. Thus, his ideas are implemented into reality.

[105] Being on one side of the border, it is impossible to detect it without crossing it.

representations. This world is unique for each subject (both individual and collective). Moreover, since the creation of some values is associated with the destruction of others, they can interact. Still, it is impossible to sum mutually exclusive values to determine the magnitude of the total value.

6. The values of various commodities or flows of commodities can be commensurate with each other, the proportions between them can be determined, and so on. But it is impossible to talk about the sum of the values of all commodities in the system, just as it is impossible to talk about the sum of the magnitudes of subject's all needs. In the context of the above, the opinion of J. Schumpeter regarding the "exchange value of all things taken together", which follows from his interpretation of Say's law, is of interest. He wrote: "Strictly speaking, there is no more sense in speaking of an economic system's total or aggregate demand …. than there is in speaking of the exchange value of all vendible things taken together or of the weight of the solar system taken as a whole…. Finally, the law, at least by implication, amounts to a recognition of the general interdependence of economic quantities and of the equilibrating mechanism by which they determine one another, …" (Schumpeter, 2006, 587)

7. As noted, the values of individual commodities only acquire quantitative certainty in relation to each other, as *relative magnitudes*, only as a result of commensuration with each other in the market process itself. They remain basically *relative* magnitudes even when they are measured by money as a unit of measurement. In this case, only the mode of commensuration of their values changes. They are measured first with a unit of value, expressed in a general form for all - in the number of monetary units. Only after that can they be commensurate among themselves as different quantities of monetary units to which they are equated. That is to say, the *direct* commensuration of values is replaced by an *indirect* commensuration, through the value of money unit. Thanks to this, *commensuration* becomes a *measurement*. Thus, *relative* prices are converted to *absolute* prices. But the system of *absolute* prices is derived from the system of *relative* prices, in which the price of one of the commodities is conditionally taken as a unit. Consequently, market prices themselves are relative magnitudes in the sense that they are indicators of the exchange ratio between the value of the money commodity and the values of ordinary commodities. However, this commodity money itself, taken as a unit of measurement, was not introduced from the outside. This is one of the commodities of the same commodity world. Therefore, it turns out that the system of *absolute prices* itself is only a more developed monetary form of manifestation of the same system of *relative prices* from which it originated.

8. Since the relative price shows only how much of some commodity is exchanged for a unit of this commodity, then the indicator of the total value of all commodities, expressed in their relative prices, loses its rational meaning. It is clear that this indicator is always equal to zero.[106] Nothing will change if we take absolute prices instead of relative prices because absolute prices themselves are only a monetary form of expression of relative prices. In this case, the relative price of a commodity is expressed in terms of the quantity of monetary

[106] For example, if commodities A and B are exchanged in the proportion 3A = 5B, then their relative prices are directly opposite and equal, respectively: Pa = 5/3 B and Pb = 3/5 A. Their total cost is 3 x 5/3B = 5 x 3/5A; 5B = 3A; 5B - 3A = 0.

units, and the relative price of a *monetary unit* is expressed in terms of the quantity of commodities purchased. This is a huge range of indicators that are inverse to market prices.[107] Thus, in the case of the *monetary form* of commensuration of values, the indicator of the aggregate monetary value of all exchanged commodities is also equal to zero, as in the case of *direct* commensuration.

The monetary value of all commodities produced does not show their total value, but only that their total value is equal to the total value of the commodity money paid for them. But the total value of all commodities itself remains unidentified. Moreover, nothing will change if commodity money is replaced by a simulacrum - fiat or credit money.[108] We can determine the sum of the monetary cost of various sets of commodities, compare them with each other, etc., but all these indicators cannot show the magnitude of the economic value of these sets of commodities. They still show only that the value of a given set of commodities is equal to the value of commodity money received in exchange.

The total value of all commodities produced over a certain period of time cannot be identified because it is not any definite magnitude in the ordinary sense of the word. Expressed in terms of Hegelian logic, it is *"true infinity"*. Like true infinity, which does not oppose the finite, but contains everything finite in itself, the total value contains the values of all commodities.

9. The value of commodities is created with their production and destroyed with their consumption, while the value of money is neither created nor destroyed their circulation process. It only circulates with money. It moves in a circle, passing from hand to hand, and covers all commodity transactions, ensuring the interconnection of all processes and demonstrating the integrity of the economic organism. This circular movement manifests the true infinity of the total value of commodities as a self-referential system that exists only in the consciousness of the collective subject (society).

The number of both commodities and money in the system can change in various combinations. The structure of value flows within the system may change. Accordingly, the distribution of income and expenses and the relative and absolute prices system will change. But since the total value is a true infinity, it can neither increase nor decrease.[109] The circular movement of counter value flows (of commodities and money) reveals the *true infinity* of the total value of the commodity world, and the creation of values through their destruction

[107] If the money price of a commodity is P_A = \$7, then the price of a monetary unit is $P_\$ = 1/7$ A.

[108] It has value in the same way that commodity money does, due to the very fact of its scarcity and universal acceptance as a medium of exchange. Since value is only a subject-object relation to limited goods, and not any property of the goods themselves, due to which such an attitude towards them arises.

[109] According to I. Kant: "According to common understanding, a magnitude is infinite if none greater than it (that is, greater than the *multiple* of a given unit contained in it) is possible. Now no multiple is the greatest, because one or more units can always be added to it. [. . .] The infinite whole does not represent *how great* it is, hence this concept is not the concept of a *maximum* (or minimum); rather, it thinks only of the *relation* to an arbitrarily assumed *unit*, in respect of which it is greater than any number. Depending on whether the unit is assumed to be greater or smaller, the infinity would be greater or smaller; yet infinity, since it consists merely in the *relation* to the given unit, would always remain the same, even though in this way the absolute magnitude of the whole would obviously not be cognized at all." (Cited in: Hegel, 2010, 206 - 207)

reveals its internal *contradiction*, which determines the *self-referential* and *procedural* nature of its existence.[110]

10. The value of a commodity or a set of commodities (of primary resources or final products) is only a certain *fraction* of the total value, respectively, of primary resources or final products. Otherwise, it is some *part of the whole*. Therefore, the values of commodities can be commensurable among themselves only as relative values, as a greater or lesser share of the total value of primary resources or final products.

As a result of a change in productivity, the *total number* of commodities in which the total values of primary resources and final products are embodied changes. The structure of produced final products and primary resources is also changing. That is, the structure of branches in which the corresponding parts of the total value are created is changing. But as a result, only the *state* of the total value changes. At the same time, the magnitude of the total value of neither primary resources, final products, nor all commodities in general, does not change.

11. Although the system of market prices reflects the correlations between the values of *commodities*, it exists only in parallel with the system of values and nowhere directly intersects with it. That is, the price system and the value system are in *the structural coupling*, which implies that they are a source of mutual changes for each other, and, at the same time, maintain the consistency of structural changes.[111] This implies that each price is a function of all other prices and that all exchange ratios of commodities are functionally interconnected within a single closed system of prices.

3.12. Self-regulation of value flows

1. Usually, economic science assumes that the more commodities are produced, the more their value is produced. And this is indeed true when it comes to individual sets of commodities or outputs of branches. But this is not the case when it comes to the *totality* of primary resources or final products. Even if in the sector of production or the sector of consumption, the output of commodities increases in all branches, in some more, in others less, then only the *shares* of the total value produced in these branches will change as a result. But the total value itself, produced in the sector will not increase or decrease. This means that it is not the *magnitude* that will change, but only the *state* (i.e., system of relative structural indicators) of the total value produced in the relevant sector.

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[110] "The image of the progression in infinity is the straight *line*;….As true infinite, bent back upon itself, its image becomes the *circle*, the line that has reached itself, closed and wholly present, without *beginning* and *end*." Hegel, 2010, 119) "It is just *because* infinity is a contradiction that it is an infinite process, unrolling endlessly in time and in space. The removal of the contradiction would be the end of infinity." (Marx, …, 1961, 51)

[111] Since the price system depends on the value system, the composition of produced (consumed) commodities depends on the price system, and again the value system depends on the composition of commodities, they all adapt to each other in the process of recursive interactions, change "towards each other", while remaining operationally closed.

Since each of the total values is produced by the consumption of the opposite side, the *state* of each of them, both *determined* and *self-determines* the state of the opposite side. There is feedback between changes in their states. But these changes depend on the decisions of economic actors based on the "calculation" of produced and consumed values. At the external level, this manifests itself in the fact that the decisions of producers about what resources to consume and what products to produce, and the decisions of consumers about what products to consume and what resources to reproduce, are mutually conditioned by each other. Thanks to this, the production, consumption and needs structures are brought into line with each other.

2. As noted, together with the transformation of totalities of primary resources and final products into each other, their total values are also transformed into each other, which are *equal* as wholes, but *opposite* in sign. But since these transformations of two totalities are mediated by commodity-money exchange, they occur in two different markets - in the market of final products and the market of primary resources. A single monetary circulation interconnects these two markets. In the resource market, money flow is exchanged for the totality of resources from which the totality of products is produced. And in the product market, the same money flow is exchanged for the totality of products as a result of the consumption of which the totality of resources is reproduced.

3. In this circular movement of money flow, what matters is the *allocation* of money between the various branches within each of both sectors of the real economy, and not the mass or velocity of money in the real economy, [112] which varies depending on economic activity. For, the prices in these markets arise as a result of the allocation of a single money flow when buying final products in the product market and when buying primary resources in the resource market. These prices, formed in two different markets, are interconnected by feedback and represent a single system. Moreover, in equilibrium, [113] the monetary value of *all* final products is equal to the monetary value of *all* primary resources. For, in both the product and resource markets, prices are formed by the same amount of money circulating in the real sector of economy. Depending on the supply and demand for certain products and resources in these markets, money is only allocated differently. This equality of the monetary value of all final products and all primary resources determines the equality of national product and national income indicators.

4. These prices tell entrepreneurs what products to produce and what resources to use for their production. And prices tell owners what products to consume and what resources to reproduce. Ultimately, it is the allocation of money flow in the product and resource markets (and the price system formed in this process) that determines how the totality of primary resources for the production of final products and the totality of final products for the reproduction of primary resources will be allocated. [114]

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[112] For money is sometimes withdrawn from the real sector to the financial sector, then put back in.

[113] There is a view of the equality of the inflow and outflow of money in the real sector of the economy.

[114] Since credits provide the same purchasing power as money, it should be taken into account that the allocation of credits is of great importance when setting prices. Of course, if the ratio between production and consumer credits, as well as between issued and repaid credits as a whole, fluctuates sharply in the course of the functioning of the economy, then the feedback between the prices of primary resources and final products will be broken. But if the balance between them is not disturbed, the allocation of the total purchasing power of

5. The self-regulation mechanism of the market economy is based on the tendency for equality of two counter value flows - commodity and money. Ideally (if there is no inflow or outflow of money from the real to the financial sector or vice versa), they should be equal. Therefore, supply and demand must be equal in both the product and resource markets. By buying primary resources for producing final products, producers create the owners' income with which they will buy these products. Likewise, by buying final products, consumers create the income for producers by which primary recourses are bought.

6. Some difficulty in understanding the above equality of counter commodity and cash flows result from the fact that investments in a given period are financed by savings of previous periods, and the savings of the given period finance investments of subsequent periods. But in the case of dynamic equilibrium, the process comes down to the fact that the counter value flows of money and the commodity are equal to each other. The total monetary cost of the final products produced by entrepreneurs in a certain time interval is equal to the sum of the owners' incomes (Wage, Rent, and *withdrawn* Profit) received during the same time interval. And the money expenditures of owners for the consumption of final products create those money incomes of entrepreneurs, by which primary resources are bought. In other words, the very process of producing commodities creates that purchasing power by which these commodities can be bought.

7. However, the accordance between the purchasing power and the monetary value of the commodities produced is only the possibility of equality between supply and demand. The actual equality of supply and demand and the clearing of markets already depend on how much the structure of commodities produced corresponds to the structure of solvent needs for them.

In the general case, the social need for a particular commodity, respectively, the social utility of the commodity is reflected in the demand price, and the social costs of its production - in the supply price. If supply and demand prices are equal in all markets, this indicates that social costs are equal to the social utility for all commodities. This means that in the economic system there is an even-utility of costs, all needs are satisfied evenly, the system is in equilibrium and operates in an optimal mode.

8. The discrepancy between supply and demand prices in the markets shows the mismatch between production and solvent needs; not what society needs with a given income distribution is produced. If the supply price is greater than the demand price, then there is an *overproduction* of commodities compared to the solvent needs for them. Otherwise, it is *underproduction*. Accordingly, the rate of profit will be below the average in the first case and above - in the second case. In such cases, resources flow from unprofitable branches to profitable ones. Due to the redistribution of resources between branches, there is a tendency to bring the social costs of producing commodities into line with their social utility. That means the existence of a trend towards the even-utility of costs and the establishment of a correspondence between the structure of production and the structure of solvent needs of society.

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society will lead to the formation of a system of equilibrium prices that provide effective feedback between social production and social consumption.

Similar processes occur in the case of a discrepancy between the demand and supply prices in the market of primary resources. Changes in the prices of primary resources affect the processes of redistribution of production factors, which is associated not only with purely economic, but also with several other factors (political, legal, social, etc.). Nevertheless, the economic forces directed at their redistribution and the struggle to possess the most deficient production factors are generated by the same feedbacks between the market prices of final products and primary resources.

9. The mechanism of market self-regulation is based on the fact that the allocation of a single money flow between a) the final products in the market of final products, and b) the primary resources in the market of primary resources are mutually conditioned due to feedback arising from the circular organization of economic processes. Approaching or moving away from the state of equilibrium (even-utility of costs) depends on the specified allocation. At the same time, the *economic equilibrium* is formed based on the value indicators of production, consumption, supply and demand, formed by feedback *within the system*. But in *what specific* commodities, and in *what quantities* of each of them, these values are embodied - it depends on the external environment with which the system is connected by causal links. Expenditure coefficients just reflect the external environment's impact (technological knowledge, consumer preferences, natural and social processes, etc.).

3.13. General equilibrium model

a) "Symmetric model"

1. The "symmetric model" is represented as a sectioned square matrix of order (m+n). It reflects a system of relationships not between economic subjects but between those economic actions, functions, commodity and money flows that ensure the integrity of the economic system. This is a model of a closed decentralized economic system in which final products (m types) are produced by consuming primary resources (n types) and primary resources are reproduced by consuming final products.[115] For the sake of simplicity, the model does not consider the production and consumption of intermediate products. Since both products and resources are commodities, the market economy is presented as a system in which the "production of commodities by means of commodities" (P. Sraffa) takes place. The division of commodities into products and resources is conditional. Therefore, all goods are products for their producers and resources for their consumers. The first sector produces products that are resources for the fourth sector. As a result of the consumption of these resources, the fourth sector produces products that are resources for the first sector. The commodities exchange occurs in the markets (sectors 2 and 3). All commodities are

[115] This model can be refined to an arbitrarily large degree by increasing the number of rows and columns. You can count the labor force by profession, physical capital by type of equipment, land by fertility zones, final products by detailed product groups, and so on. This makes it possible to use this approach to create applied models, with the number of rows and columns adapted to the computing power.

produced by some, consumed by others, sold by some, bought by others. Therefore, all agents are simultaneously producers and consumers, sellers and buyers. Each of them receives income and makes expenses, and uses the difference between income and expenses to invest in physical and human capital.[116]

The formation of income and expenses is carried out based on prices. Since the buyers' expenses are sellers' incomes, on the one hand, prices reflect the *costs* of production and, accordingly, are formed based on the prices of consumed commodities in production; on the other hand, prices reflect the *utility* of the commodities. Since utility is the ability to satisfy solvent needs, prices determine the amount of those expenses that consumers sacrifice from their income to acquire this utility. That is, the price of the purchased goods for the consumer represents a monetary expenditure. Therefore, incomes and prices paid from these incomes have opposite signs in this model. This reflects the fact that, as a result of the acquisition of commodities, prices also "neutralize" income, just as utility "neutralizes" (satisfies) needs as a result of its consumption. Therefore, the cells of the diagonal of the matrix simultaneously show both the *production value* of goods and their *use value*. Since the elements of the diagonal of the matrix are simultaneously elements of both rows and columns, they simultaneously reflect both costs and utility. The rows show the elements of the commodities' production costs, and the columns show the distribution and consumption of the same commodity in the production processes of various other commodities.

Clockwise in the matrix, resources are transformed into products, which, in turn, are consumed as resources to produce other products, etc. Counterclockwise, money income is transformed into money expenses, which in turn are themselves income and then again transformed into expenses, etc. Each diagonal element matches the rows and columns of the matrix. In value terms, the sum of the elements of each row of the first sector is equal to the sum of the elements of the corresponding columns of the fourth sector, and the sum of the elements of each row of the fourth sector is equal to the sum of the elements of the corresponding columns of the first sector. That is, in a closed economic system, only what is consumed is produced and only what is produced is consumed. In equilibrium, such a correspondence between production and consumption means that for each commodity (product and resource), supply and demand are fully correspond to each other.

[116] For the sake of simplicity, it is assumed that gross profits generated are fully withdrawn as personal income for entrepreneurs, and savings generated are fully withdrawn for investment in physical capital.

Matrix of the "Symmetric Model" of General Economic Equilibrium

Sector 1				Sector 2			
$-a_{11}x_1v_1$	$-a_{12}x_1v_2$	....	$-\alpha_1 A_1$				x_1p_1
$-a_{21}x_2v_1$	$-a_{22}x_2v_2$	....	$-\alpha_2 A_2$			x_2p_2	
....	....	....	....		....		
$-a_{m1}x_mv_1$	$-a_{m2}x_mv_2$	....	$-\alpha_m A_m$ $-P'$	x_mp_m $I = S$			
			$P = Q$ y_nv_n	$-S'$ $-\beta_n B_n$	....	$-b_{n2}p_2y_n$	$-b_{n1}p_1y_n$
		....	....	....	....	....	....
	y_2v_2			$-\beta_2 B_2$	....	$-b_{22}y_2p_2$	$-b_{21}y_2p_1$
y_1v_1				$-\beta_1 B_1$	....	$-b_{12}y_1p_2$	$-b_{11}y_1p_1$
Sector 3				Sector 4			

Tab. 1. Matrix of a closed system of economic actions

x_i - goods produced in sector 1 (consumed in sector 4), i = 1,2, ... , m;
p_i - value of goods x_i (equilibrium price), i = 1,2, … , m;
y_j - goods produced in sector 4 (consumed in the sector 1), j = 1,2, ..., n;
v_j - value of the goods y_j (equilibrium price), j = 1,2, ..., n;
a_{ij} - consumption of recourse j for production of unit of product i (technological coefficients);
b_{ji} - consumption of product i for reproduction of unit of recourse j;
α_i - the rate of surplus product (save resources) in the production of good i;
β_i - the rate of surplus product (save resources) in the production of good j;
P - gross surplus product (save resources) in the sector 1;
S - gross surplus product (save resources) in the sector 4;
Q - gross consumption in debt;
I - gross investment;
S' - saving from consumption in debt;
P' - surplus product (save resources) in the production of investment goods.

In the first sector, the difference between the monetary value of final products produced and the primary resources consumed takes the form of *profit* (P). The withdrawn profit is invested in human capital (reproduction of the entrepreneurial resource). With these funds, a *surplus product* (Q) is bought. In the fourth sector, this difference between the value of primary resources reproduced and final products consumed takes the form of *savings* (S), which, after being converted into credit resources, is invested in the production of physical capital (I), i.e., the *saved resources* are bought.[117] Agents are interested in increasing the surplus product and the saved resource. Producing surplus products requires entrepreneurial risk, while abstinence is necessary *for resource savings.*

Since each agent is both a producer who produces surplus product and a consumer who saves resources, they simultaneously perform both the function of an entrepreneur and the function of a saver.[118] Thus, in order for economic agents to gain an increase in value in the process of production and consumption of goods, both risk and abstinence are necessary. The monetary reward for risk and abstinence is precisely profit and savings.

2. **Description of the model:** Constants: a_{ij}, b_{ji}. Variables: x_i , y_j , p_i , v_j , α_i , β_j..

1) If all agents are represented as producers, then:

$$A_i = \sum a_{ij}\, x_i\, v_j \;; i = 1,2\ldots.m; j = 1,2\ldots.(n-1); \quad (1)$$

$$B_j = \sum b_{ji}\, y_j p_i \;; i = 1,2\ldots.(m-1);\ \ j = 1,2\ldots.n; \quad (2)$$

$$(1+\alpha_i)\sum a_{ij}\, v_j = p_i; \ i = 1,2\ldots.m; j = 1,2\ldots.(n-1); \quad (3)$$

$$(1+\beta_j)\sum b_{ji}\, p_i = v_j \ ; \ \ i = 1,2\ldots.(m-1); j = 1,2\ldots.n; \quad (4)$$

$$\sum a_{ij}\, x_i = y_j \ ; \ \ j = 1,2\ldots.(n-1); i = 1,2\ldots.m; \quad (5)$$

$$\sum b_{ji}\, y_j = x_i \;; i = 1,2\ldots.(m-1); \quad i = 1,2\ldots.m; \quad (6)$$

$$\alpha_0 = \frac{\sum_i \alpha_i A_i}{\sum_i A_i} i = 1,2\ldots.m; \quad (7)$$

$$\beta_0 = \frac{\sum_j \beta_j B_j}{\sum_j B_j} j = 1,2\ldots.n; \quad (8)$$

$$x_i \geq x_{min}; \quad i = 1,2\ldots.m; y_j \leq y_{max}\ ; \quad j = 1,2\ldots.n. \quad (9)$$

2) If all agents are represented as consumers, then:

$$A_i = x_i p_i \;; i = 1,2\ldots.m; \quad (10)$$

[117] It should be added that the primary resources saved in the fourth sector are those saved from their use for the needs of current consumption and not from consumption in general. They are used for investment and hence are consumed in the production of capital goods and inventories. For, primary resources (from a technological point of view) are services of production factors. But services cannot be saved except in the form of goods produced with their help (i.e., in a materialized form) or in the form of money from selling these goods.

[118] Since saving primary resources is possible only in the form of investments, saving is associated with investment risk.

$$B_j = y_j v_j;\ j = 1,2....n; \quad (11)$$

$$\sum a_{ij} v_j /(1-\alpha_i)=p_i;\ i = 1,2 ....m;j = 1,2....(n - 1); \quad (12)$$

$$\sum b_{ji}\ p_i /(1- \beta_j) = v_j\ ;\ i = 1,2 ....(m - 1);j = 1,2....n; \quad (13)$$

$$\sum a_{ij}\ x_i= y_j\ ;\quad j = 1,2 ....(n - 1);i = 1,2 ....m; \quad (14)$$

$$\sum b_{ji}\ y_j= x_i\ ;i = 1,2 ....(m - 1);\quad i = 1,2 ....m; \quad (15)$$

$$\alpha_0 =\frac{\sum_i \alpha_i x_i p_i}{\sum_i x_i p_i}\ ;i =1,2 .... m; \quad (16)$$

$$\beta_0 = \frac{\sum_j \beta_j y_j v_j}{\sum_j y_j v_j}\ ;\ j = 1,2 .... n; \quad (17)$$

$$x_i \geq x_{min};\ \ i = 1,2 ....m;y_j \leq y_{max}\ ;\ \ j = 1,2....n; \quad (18)$$

As we can see, according to these formulas in both cases, both equilibrium prices and equilibrium quantities of commodities are formed based on recursive processes. And the equilibrium condition is the equality: P = Q = I = S and, therefore, the equality of the average rate of profit α_0 and the average rate of savings β_0. Under conditions of competition, α_0 and β_0 tend toequality and, thereby, cause the tendency towards equality P = Q = I = S and, accordingly, towards the equilibrium of the entire system.

Technological coefficients are coefficients for the transformation of primary resources into final products, and consumer coefficients are coefficients for the transformation of – final products into primary resources. Prices are the coefficients of the exchange of money for commodities and, accordingly, the coefficients for the transformation of income into expenses and expenses into income.

3. In equilibrium, gross profit is equal to the gross investment in human capital (in the Entrepreneurial factor) and, therefore, is equal to consumption in debt of final products (P = Q). And gross saving is equal to the gross investment in physical capital, i.e., is equal to the consumption in debt of saved primary resources (S = I). In equilibrium, the leakage of funds from the income of producers in the form of withdrawn profit P must be compensated by the inflow of funds in the form of credits for productive investment I. And the leakage of funds from consumer income in the form of savings S must be compensated by the inflow of funds to finance consumption in debt Q. That is, in the resource market, the condition for maintaining demand at the required level is the equality P = I, and in the product market, such a condition is the equality S = Q. Otherwise, the equilibrium between supply and demand (at existing prices) will be disturbed both in the resource and product markets. But what flows out of the fourth sector in the form of savings S must, under equilibrium conditions, be equal to what, through the money market, flows into the first sector in the form of productive investment I. And what in the form of withdrawn profits P flows out of the first sector must be equal to what flows into the fourth sector in the form of consumption in debt Q (i.e., investment in the entrepreneurial factor). This is reflected in the model, according to which

productive investment (investment in physical capital) I and gross saving S correspond to the same element of the diagonal in the second sector. Therefore, in equilibrium I = S. Similarly, consumption in debt Q (i.e., investment in entrepreneurial factor, investment in human capital) and gross profit P correspond to the same element of the diagonal in the third sector. Therefore, P = Q.

The equilibrium condition is the equality P = S = I = Q. Therefore, the equality $\alpha_0 = \beta_0 = r_0$ must hold, where α_0, β_0, and r_0, respectively, represent the average rates of profit, savings, and interest rate. At the same time, it must be considered that, unlike all other commodity-money flows, the transformation of P into Q, and the transformation of S into I occur not on the basis of an equivalent exchange of commodities, but on the basis of credit relations, in which the interest rate r_0 performs a balancing function.

The violation of the equilibrium conditions in the system violates the equality between the sum of the elements of the rows and the sum of the elements of their corresponding columns. This leads to a bifurcation of the elements of the diagonal. A discrepancy arises between production and consumption, supply and demand, costs and utility, and production and consumer values. There arise scarce and surplus goods. Unsold goods or unused money will appear in the markets of various goods. Some get additional profit at the expense of other people's losses or lost profits. This generates incentives aimed at restoring equilibrium in the markets. At the same time, an imbalance between any one pair of rows and columns inevitably generates an imbalance between other pairs of rows and columns. General economic equilibrium will not be reached until the equality P = S = I = Q is reached, which means that $\alpha_0 = \beta_0 = r_0$. The equilibrium states will be formed depending on the magnitude of interest rates, and the corresponding various gross indicators – profits, savings, investments and consumption in debt.[119]

b) Fluctuations in economic activity

1. Based on the "Symmetric Model", fluctuations in economic activity, somewhat simplified, can be interpreted as follows. (See Fig.3). In equilibrium, the money flows flowing through the reservoirs (resource market and product market) and the pressures in them are equal since the outflows of money P and S balance each other in the same way as the inflows of money I and D. Under such conditions, resources and products have optimal prices. At such prices, entrepreneurs earn a normal profit, which they consider an adequate reward for the burden of entrepreneurial risk. (See Fig.4). Under such conditions, resources and products have optimal prices. So, entrepreneurs earn a normal profit, which they consider

[119] This model holds true also for a centralized economy in which all factors of production other than the labor force are public property. In this case, the final products market will be represented only by the market of consumer products, and the resource market will be represented only by the labor force market (up to full automation and robotization of production). On the basis of supply and demand, market prices will be formed only in these markets, and the prices of all other products and resources will be presented in the form of dual prices in economic-mathematical models, based on which the allocation of resources and the regulation of the economy will take place. These market prices for services of the labor force and consumer products will serve as the input for "fine-tuning" these models.

an adequate reward for the burden of entrepreneurial risk. The owners of production factors make normal savings that satisfy them as the price of abstinence.

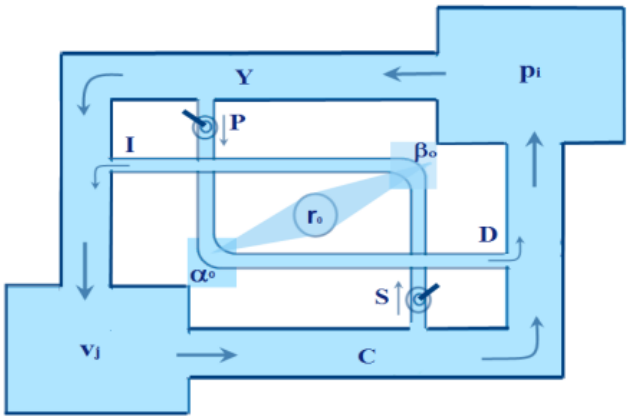

Fig. 3. Circulation of financial flows according to the “Symmetric model”.

2. In the phase of economic expansion in the economy, flows of income and expenditure increase. At the same time, as a result of the psychological law of Keynes, the marginal propensity of consumers to save increases, respectively the marginal propensity to consume decreases. As a consequence, against the general background of an increase in all money (and commodity) flows, in the sphere of consumption, the share of S increases, and the share of C decreases. On the other hand, as a result of the formation of optimistic moods, the marginal propensity of producers to take risks increases. As a consequence, opposite processes take place in the sphere of production. The marginal propensity to expand production (to reinvestment and entrepreneurial risk) increases, and the marginal propensity to withdraw profits decreases. Accordingly, in the total money flow, the share of P decreases, while the share of Y increases.

3. Because of this redistribution of flows, “money pressure” decreases in the upper reservoir (product market) and increases in the lower one (resources market). Accordingly, the relative prices of products begin to decline while the relative prices of resources begin to increase. But such changes in the price system provoke a change in the phase of the economic cycle. The recession is starting. The rate of profit received decreases, which leads to a decrease in the propensity to take risks. As a result, production is reduced; consumers' incomes and their propensity to save decrease, etc.. That is, opposite trends arise – the shares of S and Y are decreasing, while the shares of P and C are increasing. This leads to a redistribution of flows. The ratio of “monetary pressure” in the markets of products and resources is reversed. The relative prices of products again begin to increase, and resources - decline. The recovery begins.

4. Because of fluctuations in economic activity, the money supply required to service transactions also fluctuates. In the expansion phase, monetary resources are introduced into circulation from the financial sector, and in the recession phase, they are withdrawn. At the same time, it should be borne in mind that although the rates of profit received and

withdrawn by producers are different, just as the rates of savings made and withdrawn by consumers are different, but changes in the ratios of these rates in the process of expansion and recession determine only a redistribution of economic flows but not a change in the money supply in the economic system. The input and output of monetary resources occurs at the expense of the monetary assets of economic agents. And all these processes of input and output of money from the financial sector to the real sector of the economy, or the redistribution of money flows, directly depend on the level of the interest rate r_0, that is, on the price for the right to use monetary resources. For, the level r_0 affects economic decisions, and thus - on P, S, I, D, α_0 and β_0. Demand and supply in the money market form the interest rate, with the help of which the economy seeks to restore the "golden ratio" $\alpha_0 = \beta_0 = r_0$ [120] and, accordingly, the equilibrium and optimal ratios of prices for resources and products.

5. In a money economy, business cycle fluctuations are the only mechanism that brings P, S, I, and D into line (respectively, α_0, β_0, and r_0). This is a built-in mechanism for correcting imbalances in the system. However, it does not ensure the equality of these flows, which is necessary for the general equilibrium. It only keeps their discrepancies within certain limits. A decentralized economy is a "feedback" system, i.e., cause-and-effect relationships are closed in a circle and transformed into a functional relationship, due to which any deviation excites forces for its self-elimination, proportional to the strength of this deviation. The spontaneous laws of the market are "blindly" acting laws. And "blindness" is manifested because the uncontrolled self-excitation and self-inhibition of the economy continue until the critical turning points are reached - the maximum production possibilities and the minimum consumer opportunities. Therefore, without state regulation of the economy, it is impossible in principle to eliminate cyclical fluctuations.

[120] Just as Wage is the price for the right to temporarily use the services of the Labor force, Rent - the services of the Land and Physical Capital, so Interest is the price for the right to temporary use the services of money. And like all other prices, it depends on all other prices, just as they all depend on it. But just as money has a special role in the commodity world, the interest rate plays a central role in the functioning of a money economy. Interest is paid from income and savings. The owner of money can invest money in the production of goods and make a *profit* or issue a loan and receive *interest*. If the profit rate is higher than the interest rate, then the demand for money increases. This has an upward effect on the interest rate. If the profit rate is lower, the demand for money and the interest rate decrease. Under perfect competition, the interest and the profit rates tend to be equal. But if the profit and the interest rates increase, then the money supply and the savings rate increase. This has a downward effect on the interest rate. The interest rate balances the profit rate and the savings rate and thus - entrepreneurial risk, abstinence, and risk insurance. And since in equilibrium conditions, the profit rate (α_0) and the savings rate (β_0) are equal, then all three parameters strive to achieve equality ($\alpha_0 = \beta_0 = r_0$). The functioning of the economy depends on the interest rate in the same way that the interest rate depends on the functioning of the economy as a whole. Interest is a backbone indicator, which is formed depending on the supply and demand of monetary resources in the money market. But, both the demand and the supply of monetary resources themselves depend on the results of the functioning of the entire economy. In this regard, the remark of V. Pareto is interesting that "There are infinitely many extremely varied circumstances which cause gross interest rates to vary." (Pareto, 2014, 223). And no less interesting are the comments of J. Schumpeter regarding this judgment of Pareto: "Another opinion of Pareto's deserves comment. He thought that to search for the 'cause' of interest was in itself a mistake. The interest rate, being one of the many elements of the general system of equilibrium, was, of course, simultaneously determined with all of them so that there was no point at all in looking for any particular element that 'caused' interest." (Schumpeter, 2006, 892.)

c) Nonlinear properties of the "Symmetric Model"

1. "Symmetric model" is a model of an economic system in which recursive processes take place. It demonstrates the unique properties of self-referential dynamic systems, such as a decentralized economy. It is easy to see that this model is inspired by the ideas of L. Walras, but, unlike his model, in the "Symmetric Model" the role of the mystical auctioneer and "tatonnement" is performed by recursive processes, which makes it more realistic.[121] Recursive processes show which economic processes lead the system to equilibrium.[122] Feedbacks play the role of built-in stabilizers of the system, which ensure its stability. Although this model is theoretical, and shows not a real, but only a mathematically achievable equilibrium, but this model shows that in case of deviation from this equilibrium, there will be discrepancies between demand prices and supply prices (the The prices of primary resources and final products are «split» in sectors 2 and 3.). Here, the model logically assumes the emergence of such economic forces and recursive processes that "work" to restore equilibrium.

The model assumes only the pure logic of economic processes and not the real state of the economy, which can be achieved in historical times. Of course, real states result from a sequence of real events and reactions to them and they are far from ideal equilibrium, which is theoretically assumed by the system of equations in the mathematical model. The model can only show the *logic of the interaction* of economic forces in the real economy, ensuring its ability to achieve homeostasis.

2. This model reflects the state in which the decisions of all actors are fully coordinated so that they have no incentives to change their choice. That is, the economy is in a state of

[121] This model shows the universal interrelationship between economic phenomena. This relationship, first discovered by L. Walras, was of great importance for economic theory. However, to ensure the "operability" of his model, he had to artificially introduce into his model an *auctioneer* that does not exist in the real economy. "It was but slowly that the fact began to dawn upon analysts that there is a pervading interdependence between all economic phenomena, that they all hang together somehow.… But they never bothered to investigate *how* things hang together. … They were very far from realizing that this all-pervading interdependence is the fundamental fact, … and that the most fundamental of all specifically scientific questions is the question whether analysis of that interdependence will yield relations sufficient to determine—if possible, uniquely—all the prices and quantities of products and productive services that constitute the economic 'system.' …. Isnard, A.Smith, J.B.Say, Ricardo, and others all struggled or rather fumbled for it, every one of them in his own way. But the discovery was not fully made until Walras, whose system of equations, defining (static) equilibrium in a system of interdependent quantities, is the Magna Carta of economic theory …. The history of economic analysis or, at any rate, of its 'pure' kernel, from Child to Walras might be written in terms of this conception's gradual emergence into the light of consciousness." (Schumpeter, 2006, 232-233.)

[122] M. Blaug writes about the theory of general equilibrium (GE) of Walras: "In one sense, GE theory makes no predictions: it attempts to establish the logical possibility of GE without showing how it will come about and even without claiming that it will actually come about as a result of spontaneous forces. To be sure, Walras himself believed that he had provided an explanation of how real-world competitive markets would reach equilibrium via the process of *tdtonnement* or "groping." But there are serious deficiencies in the Walrasian notion of *tdtonnement* …. , and to this day it is not possible to show that a final equilibrium in the economy as a whole is independent of the path taken towards equilibrium or that, of all the possible paths chosen, the one that is actually adopted will and must converge on equilibrium. All modern work on GE theory of the Arrow-Debreu variety has been confined to "existence theorems" - theorems that state the conditions under which a GE system has an unique solution - and to questions of the stability of equilibrium once equilibrium is attained. In other words, we are almost as far away as Walras was from discovering the real-world counterpart of the equilibrating forces invoked by GE theory." (Blaug, 2006,162)

Nash equilibrium. No one will increase the price of his goods above the equilibrium price because he will not be able to sell them, and no one will decrease the price below the equilibrium price because he will not receive a normal profit.

3. All macroeconomic processes are derived from microeconomic foundations. The main commodity and money flows at the macro level are formed based on the economic actions of actors at the micro-level. The dynamics of the interaction of these flows give rise to cyclic fluctuations, which are characteristic of nonlinear dynamic systems.

4. The model implies that the slightest changes in a particular price, quantity, production or consumer coefficients, because of recursive processes, give rise to significant changes in the entire system. In other words, the "Butterfly Effect" appears, which is also inherent in nonlinear systems. For clarity, the process of the birth of this effect in the "Symmetric Model" is shown below.

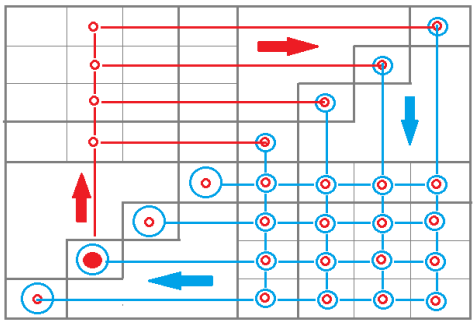

Fig. 4. A slight change in the price of one of the primary resources in the third sector leads to significant changes in *prices* and *quantities* of commodities, and *expenditure coefficients* in the entire system. (The arrows indicate the direction in which, step by step, the prices of commodities change.)

5. The model assumes operational closure and causal openness of the economic system. This is manifested in the fact that expenditure coefficients (production and consumer norms) are set from the outside and depend on changes in the external environment (technology, science, natural factors, social and political processes, culture, traditions, consumer preferences, etc.). On the other hand, prices, quantities, rates of profit, rates of savings, and interest rates - are variables, depending on internal system processes, are in a functional relationship with each other, and respond to any changes in expenditure coefficients in such a way that intra-system equilibrium is maintained. With the help of recursive processes, they ensure the self-regulation of the system and its constant striving for equilibrium as its *attractor*.[123] In the case of ideal equilibrium, each action of each actor is complemented by

[123] "On the graph, the attractor looks like a convergence of trajectories to one point or a closed loop, within which the system's state fluctuates regularly. The convergence point does not depend on which place on the graph the trajectory is drawn from, that is, on the initial conditions of motion. In synergetics, they speak of the cone of attraction of the attractor, which, as it were, draws into itself the set of possible trajectories of the system, determined by different initial conditions. The funnel of attraction pulls together the disparate initial lines of trajectories into a common, ever narrower beam. The paradox of the attractor's action lies in the fact that it carries out, as it were, determination by the future, more precisely, by the upcoming state of the system. The state has not yet been reached, it does not exist, but in some mysterious way, it stretches tentacles from the future to the present. This is where the philosophical problem of the possibility of goal-setting in inorganic nature arises. Can an attractor be regarded as a kind of target of the system's motion? In synergetics, the answer

the corresponding action of some other actor in the same system. Together, the actions of all actors, like puzzles of a single picture, leaving no gaps, form a closed, completely balanced system of economic actions. But such an ideal state is only an "attractor" of a real economy based on the division of labor.

Expenditure coefficients are a kind of link between the system and those changes in the external environment that are important for the system. They change under the influence of the environment. However, the system's response to these changes leads to a system's feedback on the environment. This is manifested in the fact that the technologies used, consumer preferences, etc., are changing, which, in turn, changes the consumption coefficients themselves, transmitting these changes in the external environment to the system itself. The system responds to these environmental changes by changing the structure with the help of prices and quantities of commodities in order to maintain its integrity. The system remains indifferent to all those environmental changes that are not reflected in the expenditure coefficients.

6. Due to operational closure, the system keeps its autonomy. In the model, this is reflected in the fact that the sum of the elements of each row, as well as the sum of the elements of each column, is equal to zero. However, the autonomy of the system does not mean its isolation. For, as was shown above, although the system is influenced by the environment but, in accordance with its interests, it selectively responds only to those changes that are vital to maintaining its integrity and viability.

This model assumes the autonomy of the economic system also in another sense. The national economy is a subsystem of the world economy. But in a competitive environment, the national economy retains autonomy when interacting with the world economy. This is possible because the system can maintain an internal balance. Its trade balance, expressed in *national prices*, is completely balanced. But in terms of *world prices*, it may run a trade deficit or surplus. This does not violate its autonomy. Below is a diagram that allows you to visualize the aforesaid.

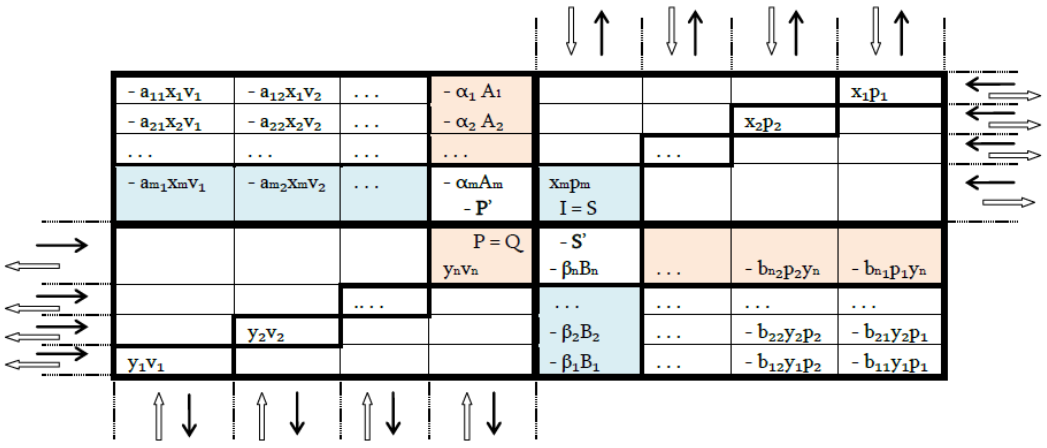

Fig. 5. Exports and imports of goods and services balance each other when expressed in national prices, but there may be a trade deficit or surplus when expressed in world prices.

is that it is unlikely in the ontological sense. But in a methodological sense, looking at an attractor by analogy with a goal, as if it were a goal chosen by the system, often turns out to be effective." (Knyazeva, ..., 2000, 169.)

(Black arrows show exports and imports in the case of a negative trade balance, and white arrows in the case of a positive trade balance.)

7. Considering the production of intermediate products and the service sector, the model will take on a more complex form. However, the functional closure of the system and the very essence of the ongoing processes remain unchanged. (See Fig. 6 and 7.).

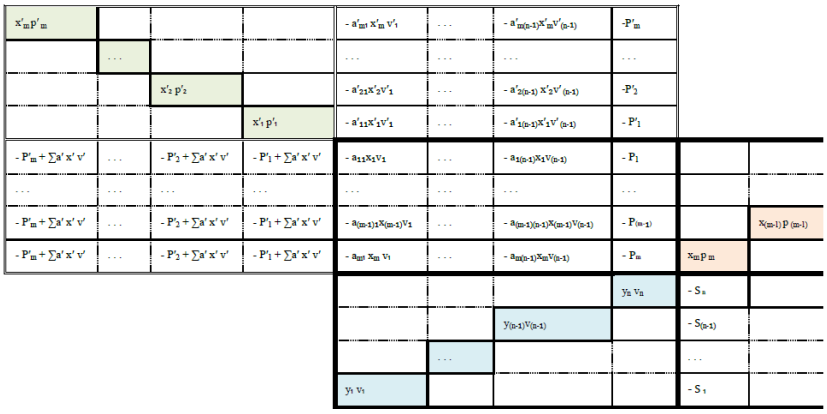

Fig. 6. Matrix of the "Symmetric model", considering the production and consumption of intermediate products.

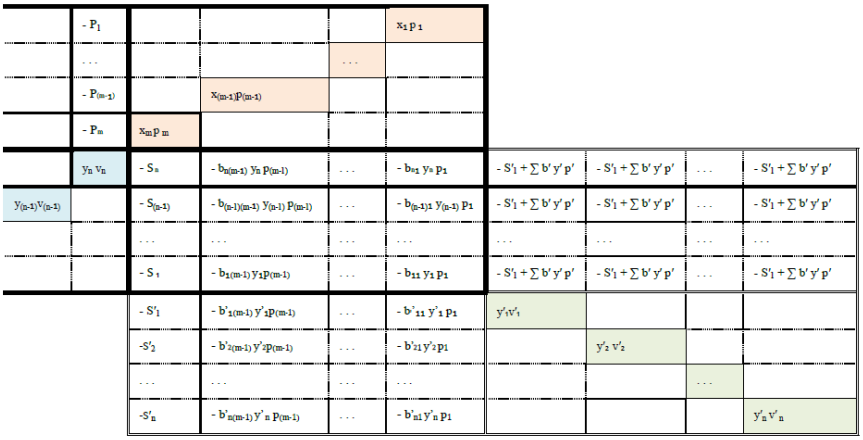

Fig. 7. Matrix of the "Symmetric Model", considering production and consumption in the service sector.

The prices of primary resources also include the prices of services produced in the fourth sector, just as the prices of final products include the prices of intermediate products produced in the first sector.

3.14. Business cycles

a) Causes of occurrence

1. A fundamental property of the behavior of nonlinear systems is the periodic alternation of acceleration and deceleration of processes, integration and disintegration.[124] These properties are "embedded" in the very nonlinearity of the processes. All these features are characteristic of economic systems.

The fluctuations of the economic system and its evolution are a spontaneous result of the interaction of millions of independent agents, each of which purposefully acts in their own interests. And since the economic relations of the subjects are based on voluntary principles and no one is forcing anyone to enter into relations with other subjects, the ties between them easily arise and are easily broken. This circumstance gives rise to both the possibility and the necessity for self-regulation of the market economy as a complex nonlinear system. Under such conditions, the economic order is born out of the chaos of randomly emerging and broken economic ties between the economic actions of independent subjects.

2. Economic cycles in a competitive environment are endogenous. Although external factors have repeatedly caused economic crises, both before and after the birth of a market economy (the most recent examples, the Coronavirus pandemic and war in Ukraine), they were not recurring, cyclical crises. Moreover, exogenous factors can contribute to or hinder the change in the phases of the economic cycle, accelerate or slow down expansion or recession. But since they themselves do not have a periodic nature, they cannot be the cause of an economic cycle having periodic nature. The internal causes and logic of the emergence of economic cycles are because of the economic system's nonlinear properties and its homeostasis. These properties allow the economic system to maintain a state of dynamic equilibrium with the help of coordinated reactions, thereby ensuring the preservation of the vital parameters of the system within acceptable limits and, thereby, within certain limits, ensuring the independence of the system from the influences of a changing environment.

3. The existence of an overall interconnection between the actions of market agents, in itself, causes a coordinated growth and decline in their economic activity, general waves of acceleration and deceleration of economic processes in the system as a whole. The integrity of the economy, as a system of economic activities, is conditioned by the fact that all subjects produce goods for each other and exchange them among themselves. This is possible only

[124] "Stability and instability, replacing each other, give rise to an oscillatory regime. ... Open, nonlinear systems constantly balance between chaos and order in a state of dynamic equilibrium .... Such an oscillatory process prevents the collapse of a complex structure due to its instability near the moment of escalation, harmonizing the development pace of various fragments of a complex structure. .... There are some universal, inherent to both living and non-living, laws of rhythm, cyclic change of states: rise - fall - rise, etc. Only by following the "rhythms of life", the oscillatory regimes, can systems maintain their wholeness and develop dynamically." "Chaos and order are two sides of a single dialectical principle of nature." (Metelev, 2011, 38-39). The existence of economic cycles is necessary for the self-regulation of a decentralized economic system. Without such cycles, the economic system cannot exist. Inadequate methods of conducting a countercyclical policy cause a breakdown in the market mechanism of self-regulation. In such cases, there is an accumulation of intrasystem deformations, which later manifest themselves in the form of deep and prolonged crises (an example of this is the 2008 crisis).

because of the mutual coordination of their actions and the establishment of a certain order in the functioning of the system as a whole. But this order is established spontaneously and periodically violated. The alternation of order and chaos in the system of collective action takes the form of an economic cycle.

4. The actual dynamics of the economy, as a complex system, is the result of the combined action of internal and external factors. Therefore, the randomness of external factors, together with the randomness of endogenous fluctuations, causes a complex trajectory of economic development in the form of periodic waves. But the problem is also complicated because the waves of economic activity at different levels, generated by short-, medium- and long-term cycles, overlap each other, as a result of which the development of the economy acquires extremely complex dynamics. Therefore, without studying the nature of complex systems, it is difficult to identify any regularity within it.

5. Fluctuations in economic activity are the acceleration and deceleration of economic processes.[125] What do they depend on? As a social action, economic action involves not only the transformation of one commodity into another but also a *transaction*. Accordingly, economic action itself implies *transaction costs*.[126] It is clear that if, because of the rupture of economic links, transaction costs of time increase, then economic processes will slow down.

In times of crisis, economic ties are easily broken, but are difficult to establish. As a result, although the subjects have resources, they cannot use them and cannot carry out economic actions. They cannot buy because they cannot sell, and therefore they cannot consume or produce, and so on. But no one can understand - why? After all, nobody wants that, right? On the contrary, everyone wants to consume, produce, buy and sell. Some "invisible hand", against their will, dominates them.

There are producers, consumers, resources, and products in society. There are no only necessary *links* between the subjects, without which they cannot carry out coordinated economic actions. *Links* are severed. But the links are exactly what Chaos Theory or Synergetics studies. That is, the reason is not in the lack of resources, but in systemic capabilities, in the laws of functioning of complex nonlinear systems. Subjects have no ability to *transact* and, as a result, cannot *transform* one commodity into another.

But why are links being severed? Because not the products consumers need are produced. Therefore, they are not bought. And if products are not bought, they cease to be produced, and consequently, primary resources cease to be bought. Therefore, consumers (owners) have no income. And this means that there are no expenses and products are not bought, etc. And why is produced what is unneeded and not produced what is needed? Because in a market economy, products are first produced, and then they find out on the market whether buyers need them. This is the reason for entrepreneurial risk, which requires its payment in the form of profit.

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[125] As a rule, fluctuations in economic activity are expressed in terms of changes in GDP, i.e., using fluctuations of the final product created per time unit in terms of value. But these fluctuations can also be expressed in terms of fluctuations in the length of time required to produce the value of the annual product in the starting year. Economic processes either accelerate then decelerate.

[126] Transaction costs imply costs (time, money, labor, etc.) associated with participation in market processes. These are the costs associated with the collection and processing of information, negotiation, the conclusion of contracts, decision-making, control over compliance and legal protection of the terms of contracts. Concerning to these costs, time costs are particularly sensitive.

6. It is important to note that the economic cycle, as such, is conditioned by monetary relations. In a barter economy, crises can be born by external factors, but endogenous crises of overproduction and economic cycles cannot occur there.

"..... On what basis can a general commodity overproduction arise if the demand for commodities is determined by the same commodities, and the supply of each new commodity is a new demand that has appeared in the market? ... Let us take, for example, bartering - the exchange of product for product without the mediation of money. Let, for example, cloth be directly exchanged for bread. Here, if bread is produced in excess in comparison with cloth, then its price in relation to cloth will fall, but the price of cloth in relation to bread will rise: an excess production of bread will be tantamount to an insufficient production of cloth, a decrease in the price of one product will be compensated by an increase in the price of another. Obviously, there cannot be a general overproduction of both products, because the price of both bread in relation to cloth and cloth in relation to bread cannot simultaneously fall. Overproduction, like the fall in prices, can in this case be only partial.

Let us now assume a money exchange. Let the price of bread and cloth be expressed in terms of the third commodity, money. Let us suppose that more bread is produced than the manufacturer of cloth needs; the money price of bread will then fall. This reduction can be so significant that the total amount of money earned by the producer of bread will decrease: for more bread, the producer will receive less money. Thus, the producer's purchasing means will decrease. And since the producer of bread buys cloth with these funds, it means that the money demand for cloth will also decrease, which will cause a decrease in the price of cloth. And cloth will fall in its money price following the fall in the money price of bread.

In other words, there will be a general excess of the supply of commodities in comparison with the monetary demand for them, a general decrease in prices; and the general fall in prices is felt by the market as an expression of a general overproduction of commodities.

But the basis of the general overproduction of commodities in this case is a partial overproduction, a disproportionate distribution of the people's labour. More than enough production of one commodity causes its money price to fall; and as there is a certain connection between the money prices of commodities, the fall in prices embraces other commodities as well. Thus, the general overproduction in this case is nothing but a peculiar expression, in the conditions of money exchange, partial overproduction, disproportionate distribution of social labor." (Tugan-Baranovsky, 2008, 313-314.)

7. As in all complex systems, the protection of the economic system from the destructive scope of fluctuations of its vital parameters occurs with the help of negative feedbacks. They ensure the preservation of the structure and integrity of the system, which is lost in case of an excessive deviation from the state of equilibrium. But if, under the influence of external factors, the deviation from equilibrium goes beyond the permissible values, then positive feedbacks begin to act. Processes begin to develop under a completely different scenario in the "escalation mode". In an economic system, this means that the equilibrium *structure* of the system breaks down, and a recession begins. After a recession, the system can no longer restore the former equilibrium and is moving towards a new state of equilibrium.

b) Self-regulation of economic activity

1. Economic cycles are evidence of the market's ability to self-regulate. In a competitive environment, the *deviation* of the system from the optimal state excites forces for its *self-elimination*, which are proportional to the magnitude of the deviation. The nature of the market's self-regulation is due to the very nature of the the market system's functioning. Theoretical analysis of the economic mechanism of self-regulation in its purest form implies the absence of a regulatory center in the economic system. No one allocates resources between different branches or between different subjects within branches. No one knows in advance what cumulative resources society has, what are the needs of society, and the parameters for the optimal functioning of the economy.

Business cycles are an integral part of the self-organization mechanism of the economic system. With them, it seeks to eliminate periodically accumulated branch disproportions and restore macroeconomic equilibrium. "The equilibrium of the system is maintained homeostatically, primarily through negative and sometimes positive feedbacks that shake the system, take it out of equilibrium, in order to return it again at a different level and with mutually transformed components. The transition to a different mode of functioning through the stage of greater or lesser chaos and desynchronization of processes is the way to extend the "life" of any complex organizations." (Князева, 2014, 19.) In the economy, it is manifested in the fact that after each crisis, the system tends not to the previous equilibrium but to a new equilibrium at a new level.

2. Economic agents independently make decisions based on market prices. And their actions are coordinated by the market itself based on a system of spontaneously formed prices. Under such conditions, the fluctuation of the economic activity of society cannot be carried out other than in the form of movement by inertia from one extreme state of the economy to another. The ups and downs of activity amplify themselves and continue until they reach the peak or bottom of the economic cycle. Briefly, we can say that the upper limit of economic activity is caused by the fact that society cannot produce more, and the lower limit by the fact that it does not want to consume less because it has reached the threshold of tolerance.

When the phase of the economic cycle changes, the processes continue according to the principle of self-excitation or self-inhibition until a new turning point is reached. The market cannot restore macroeconomic equilibrium except through fluctuations between extreme peaks and bottoms, driven by maximum production possibilities and minimum consumer needs.

3. The fluctuation of economic activity is due to the alternation of activation of positive and negative feedbacks between the value flows of commodities and money. *Positive* feedbacks are based on optimistic and pessimistic expectations, which cause self-excitation or self-inhibition of the economy. *Negative* feedbacks are based on Keynes' "psychological law" regarding the marginal propensity to consume and save, which determines a change in the phases of the economic cycle.

When overcoming the crisis, when the needs of society are far from being saturated, and consumer demand begins to revive, optimistic moods intensify. As a result, the demand for investment goods begins to grow. The more the production of consumer goods grows, the stronger the optimistic mood, and the faster the demand for investment goods grows. Employment and incomes of workers are increasing in investment sectors. This further increases consumer demand, followed again by an acceleration in demand for investment goods, and so on. The processes proceed in the self-excitation mode.

4. With the growth of production, incomes, and the saturation of necessary needs, another trend begins to dominate. Namely, according to Keynes' psychological law, with an increase in income, savings in their composition grow faster, and consumption - more slowly than the income itself. And when incomes fall, savings decline faster and consumption declines slower than incomes. That is, saving is the most variable part of income. Accordingly, with an economic recovery, the share of consumption in the composition of growing incomes decreases. After a certain critical point, consumer demand begins to lag behind the growing supply of consumer goods. With some delay in tim, the supply only begins to respond to the backlog of demand. Difficulties in the sale of consumer goods cause entrepreneurs to change their optimistic expectations to pessimistic ones, because of which the demand for investment goods is reduced.

As the peak of economic activity approaches, there is a mismatch between *savings*, whose share rises as part of rising incomes, and *investment demand*, which begins to decline because of growing difficulties in selling goods and the resulting pessimism. Such a gap between savings and investment demand causes a leakage of income from the real sector to the financial sector of the economy. (Securities are bought, savings are made, speculative transactions are financed, real estate is bought, etc.). Therefore, part of the income does not participate in the formation of aggregate demand. Aggregate demand, which until then more or less matched aggregate supply, begins to lag behind it, and the economy begins to fall. That is, there is a change in the phase of the economic cycle. The rise is replaced by a decline.

5. The more the production of consumer goods is reduced, the stronger the pessimistic expectations and the faster the demand for investment goods decreases. In investment branches, incomes decline, accelerating the decline in consumer demand, followed by an even greater decline in investment demand, and so on. The decline in production continues until the economy reaches the bottom of the cycle. Along with the fall in production, incomes are reduced, in which, according to Keynes, the reduction in consumption slows down relative to the reduction in incomes themselves. Accordingly, the decline in consumer demand relative to supply slows down and then stops.

When the majority in society reaches the threshold of tolerance and does not want to put up with a further drop in living standards, it begins to spend money savings and sell off assets. Therefore, in a crisis, asset prices fall sharply, and they are bought with great profit by the subjects who have accumulated money resources that have flown out of the real sector during the economic downturn because of weakening investment demand.[127] Thus, money

[127] At the same time, there is a concentration of wealth and a growing polarization of society into rich and poor.

from the financial sector returns to the real sector and increases consumer demand. Between the supply and demand of consumer goods, equilibrium begins to restore.

Thus, after the cumulative decline, having reached the lowest point of the cycle, the negative feedback turns on again, and the phase of the cycle changes again. Processes are developing in the opposite direction. Pessimistic moods are replaced by optimistic ones. Demand for investment goods begins to grow, needed to replace wornout capital and increase new capital. And this means that employment and incomes in investment branches are increasing, which leads to an acceleration in the growth of demand for consumer goods, etc. That is, positive feedback is switched on again.

6. In a crisis, resources remain unused, and needs remain unsatisfied. For resources are not owned by those subjects who can satisfy their needs with them. As long as there is no solvent demand for the products of a particular branch, the needs of this branch itself for the resources necessary for production also remain insolvent. Since production and consumption are uncoordinated, money circulation is also upset. As noted, economic subjects cannot buy because they cannot sell. And they cannot sell because they cannot buy. And therefore, also, they cannot consume and produce.

Economic recovery is possible only in the mode of dynamic equilibrium. For each branch must produce in accordance with the needs of all other branches. Therefore, the growth rates of each branch are formed in coordination with the growth rates of other branches. No branch can increase the production of products without increasing the consumption of resources. And no branch can increase its consumption of resources if its suppliers do not increase the production of products that are resources for branches that consume them, and so on. Therefore, the rise is gradual. But the economic downturn occurs spontaneously and does not require compliance with the proportionality of branches. Having reached the climax in the economic recovery process, imbalances between branches begin to spread in a chain reaction. A decline begins that cannot stop until it reaches the bottom. And everything repeats. A new branch structure is formed in the recovery process, which takes a long time. And during a recession, the branch structure is destroyed. This is a cumulative process and occurs quickly by chain reaction.

7. Although starting from the bottom of the crisis, free resources are gradually introduced into those branches that grow in harmony with other branches, but no one regulates this process. Order arises spontaneously. "Indeed, maintaining communication within the order requires that dispersed information be utilised by many different individuals, unknown to one another, in a way that allows the different knowledge of millions to form an exosomatic or material pattern. Every individual becomes a link in many chains of transmission through which he receives signals enabling him to adapt his plans to circumstances he does not know." (Hayek, 1991, 84.) All subjects separately make decisions, guided only by their own interests. The only coordinator of their actions are spontaneously formed market prices. In the conditions of such a spontaneous formation of order, although each branch produces in accordance with the needs of other branches, nevertheless, as the economy approaches the peak of the economic cycle, interbranch imbalances accumulate in it. The integrity of the economy is being disrupted.

One of the main reasons for this is that the production and supply of capital goods requires forecasting future demand, sometimes for many years ahead. Of course, making

accurate forecasts in a decentralized economy is impossible. Therefore, over time, as production expands, the discrepancy between the actual and the equilibrium branch proportions becomes increasingly vocal.

8. In a crisis, the balance is restored. But it is restored not by expanding deficit branches, but by reducing less deficit (relatively surplus) branches. Those branches that have not yet been reduced enough are shrinking. They come into line with those branches that can no longer shrink and have reached the "bottom". But why can they not shrink any further? Because society has reached the threshold of tolerance and does not want to tolerate a further reduction in the consumption of urgently needed products produced by these branches. Economic values are being reassessed. Accordingly, there is a redistribution of solvent demand from other branches. Therefore, the demand for the products of these branches ceases to fall at the expense of an acceleration of the fall in demand for the less needed products of other branches. Also, additional monetary resources from the financial sector are pouring into the real sector of the economy to sustain demand for urgently needed commodities. At the bottom of the economic cycle, the proportions and integrity of the economic organism are restored.[128] The rise in a state of dynamic equilibrium begins again.

c) "Natural selection" in economy

1. Because of the redistribution of assets mentioned above, structural changes are occurring in the economy. Along with the process of concentration and centralization of capital, there is a flow of capital between branches and a change in the branch structure of the economy. The *supply* begins to form according to the growing *demand* structure, and the *production* structure is brought into line with the newly formed structure of solvent *needs*.

2. The crisis is the removal from the system of everything obsolete and unviable. On the wave of expansion, in the process of moving from depression to a new peak, new functional links and structures are born in the economic system, new markets, new needs are born, new technologies are introduced, etc. However, some of them are viable, some are not, some are progressive and some are regressive. Everything that is random, non-viable, and regressive during a recession dies. And what is progressive, viable, and necessary is preserved. That is, the end result of such an undulatory movement of the system is that only progressive changes and innovations are preserved. Therefore, the general trend for the development of the system remains, and fluctuations occur relative to this long-term development trend.

However, this trend is only implied, and the actual trajectory of the development of the system has a zigzag shape, in which each next peak is higher than the previous one, and each next bottom is higher than the previous one. Depending on the scale and solidity of this "creative destruction" generated by the economic cycle, we get, respectively, small, medium

[128] "Cyclic crises are, respectively, phases of the cycle when there is a clear and significant equalization of the proportions of reproduction, primarily between capital-forming factors, on the one hand, and consumption, on the other. ... Crises form, as it were, the boundaries of cycles: each crisis clears the way for expanded reproduction, which then becomes impossible due to the development of contradictions, and the next crisis has to "settle" it." (Pokataev, 1978, 47.)

and large waves of this cycle, which overlap each other, forming a complex configuration of wave movement.

This process is analogous to Darwin's natural selection process. When introducing this or that innovation, no one knows in advance how viable and necessary it is. Only time will show this. The principle of "trial and error" is the only way of evolution when the system functions spontaneously and there is no regulation based on deliberately chosen goals. Such development is a spontaneous result of the interaction of millions of people, each actings only in their own interests.

3. Economic agents are interconnected by "weak ties" that are easily broken and easily created. To an external observer, the specific actions of particular agents seem to depend on random circumstances. And it seems to the agents themselves that they are independent in their actions. However, under the conditions of the division of labor, each agent can act only as an actor in one or another branch. But the interaction of these branches is subject to the "iron law" of the proportionality of branches. As it was pointed out, for the normal functioning of the economy, all branches must produce under the solvent needs of each other, and the corresponding branch structure must be maintained. In this sense, being part of the collective actions of various branches, the actions of all agents are subject to the invisible action of this law of proportionality of branches. Through the operation of this law, the actions of all agents are interconnected. As long as the economy functions normally and branch proportions are maintained, agents more or less freely make decisions and do not see this relationship. For the very optimal structure of branches is the invisible deep structure of the economic system, and belongs to the sphere of the essence of the economy, and not to the world of economic phenomena. The existence of this structure is only indirectly manifested in the fact that, during a crisis, due to the deformation of branch proportions, the normal functioning of the economy as a whole is disrupted.[129]

The integrity of the economy is violated when the branch structure is deformed because of the rupture of ties between the externally independent but internally interconnected actions of economic agents. This is manifested in the economic crisis. Below, we once again quote Marx, which reveals the essence of this process.

> *"No one can sell unless someone else purchases. But no one directly needs to purchase because he has just sold. Circulation bursts through all the temporal, spatial and personal barriers imposed by the direct exchange of products, and it does this by splitting up the direct identity present in this case between the exchange of one's own prpduct and the acquisition of someone else's into the two antithetical segments of sale and purchase. To say that these mutually independent and antithetical processes form an internal unity*

[129] "…necessary for the existence of what we call economic thought is a level of abstract inquiry – an inquiry directed not at the "facts" of economic life but at some structure or principle "behind" the facts. In this second of its tasks, economics deals with empirical data only as indications – necessarily incomplete and very often misleading – with respect to the object of its investigation. It looks beyond appearances for essences, as Marx would say; or beyond the data for covering laws, in the positivist vocabulary. Economics now becomes an inquiry into the systemic properties, the structural attributes, the tendencies and sometimes even the ***telos*** of the provisioning process. Thus behind empirical investigations into allocation problems we have theoretical premises as to the "workings" of the price mechanism; behind the functional equations of econometric models there are assumptions as to the "laws of motion" of the capitalist system; behind input-output matrices are "production functions", equally abstract representations of the idealized behavior of the industries in question." (Heilbroner, 1988, 106-107.)

is to say also that their internal unity moves forward through external antitheses. These two processes lack internal independence because they complement each other. Hence, if the assertion of their external independence [iiusserliche Verselbstiindigung] proceeds to a certain critical point, their unity violently makes itself felt by producing – a crisis." (Marx, 1976, 209.)

Such processes, which "form a certain internal unity", but are "externally independent" besides the sale and purchase about which Marx writes, are also production and consumption, supply and demand, investment and consumption in debt, lending and borrowing. And in a broader sense, "internal unity" and "external independence" are inherent in products and resources, utility and costs, profits and savings, and so on. All these processes and phenomena are internally interconnected at the level of essence. Here, commodities are produced by commodities; actions are functionally interconnected into a single system; branches mutually complement each other and form the economy as integrity, as an indissoluble unity of the processes of *production*, *consumption*, *distribution*, and *exchange*. They form a single operationally closed nonlinear system, the self-regulation of which is carried out due to positive and negative feedbacks. But since the actions of the actors are interconnected based on "weak ties" that easily arise and are easily broken, the formation of the necessary interbranch proportions occurs spontaneously. Because of this spontaneity, the uninterrupted functioning of the system is periodically hindered, the *mismatch of branches* increases, and "their unity violently makes itself felt by producing – a crisis." (Marx).

4. During crises and recessions, money is withdrawn from circulation in the real sector, and on the other hand, a certain part of the production factors remains idle, and therefore does not generate income. The presence of free money and unused production factors give rise to economic incentives to redistribute ownership of the means of production. As a result, structural changes occur in the economy during crises. The services of these production factors are redistributed to those branches for whose products the demand is growing. Thus, the gradual incorporation of free production factors into these branches allows them to develop faster than other branches. A new configuration of the branch structure is being formed, and the economy begins to emerge from the crisis while maintaining a dynamic balance.

To summarize, we note that during crises, when the mass of free money and free production capacity increases, the most large-scale redistribution and consolidation of property occurs. Regularly repeating ups and downs of economic activity, crises and booms are accompanied by an irreversible process of concentration and centralization of production. This creates the preconditions for the monopolization of the economy. The competition itself generates and strengthens monopolization and makes its own death inevitable.

Section 4.
Monopolized economy

4.1. Monopolization

1. Competition itself gives rise to monopoly.[130] Whereas under conditions of competition the quantity and prices of commodities were regulated by market forces, then under conditions of monopoly they are regulated by the monopoly itself. Using market power, monopolies reduce the quantity and increase the price of commodities compared to competitive ones. That is, they artificially create a deficit *by which* for each unit of cost, there is more utility of the commodities produced (or less cost per unit of utility) than in a competitive equilibrium. The principle of even-utility of costs, which is necessary for the optimal functioning of the economy, is violated. In this way, the monopolies earn profits above the average rate. In a competitive economy, local and global optimality criteria organically complement each other, which leads to the equalization of profit rates in various branches, and the general trend towards the even-utility of costs. But the market power of the monopolies enables them to keep high rates of profit from equalizing with the rate of profit of competitive branches. This leads to the dominance of the local optimality criterion over the global and, accordingly, private interests over public ones. This leads to deformations of the optimal branch structure, deviation from the principle of even-utility of costs, and fundamentally changes the conditions for the sale of commodities. Systemic problems emerge that lead to economic stagnation.

2. Unlike the equilibrium price, the monopoly price of a commodity does not reflect the equality between its social utility and social costs. By artificially creating deficit, monopolies get an *economic surplus*.[131] "Economic surplus" is not a surplus value, but a value that *exceeds* it. *All* entrepreneurs create surplus value, but *only* monopolists create an economic surplus. The economic surplus is a value of that part of a surplus product which the monopolies create in addition to the surplus product underlying normal profit. Surplus value

[130] Hereafter, unless otherwise stated, the term monopoly will mean both monopoly and oligopoly.

[131] By "economic surplus" we do not mean all surplus value, but that part of it that is created thanks to the producer's monopoly power and which exceeds the normal surplus value. An economic surplus is a value of that part of a surplus product that is created not by additional production costs and increased output. On the contrary, by reducing production (respectively, reducing costs) and artificially creating deficits, the share of a surplus product in the output increase, and the share of a necessary product decrease. The share of profit in the price of goods increases accordingly. All entrepreneurs create surplus value, but only monopolists create an economic surplus. Surplus value underlies money profit; profit is its monetary expression. And economic surplus underlies the increment of monopoly profit over normal profit.

underlies normal profit; profit is its monetary expression. But economic surplus underlies the increment of monopoly profit over normal profit. It represents the excess of use value over the production value of a commodity, that is, surplus of value resulting from the overestimation of the utility of commodities over the cost of its production.

3. The existence of monopoly incomes sharply increases economic inequality. The one with the most market power wins the competition. Accordingly, the rich get richer, the poor get poorer. The huge increase in the share of profits in the composition of national income, caused by monopolization, can occur only at the expense of a reduction in the share of other factor incomes. Accordingly, an increase in the share of the surplus product bought by entrepreneurs from each other can occur only at the expense of a decrease in the share of the necessary product bought by the recipients of Wage and Rent. In other words, an economic surplus arises from a decrease in the necessary product. And if we consider that the subjects performing entrepreneurial services often also combine the functions of owners of Land and Capital, then it turns out that the economic surplus is got mainly by reducing the share of the necessary product that is bought by the Wage. That is, the redistribution of the produced product occurs basically between Profit and Wage.

4. As inequality rises, more and more income is concentrated in the hands of a smaller group of oligarchs. Accordingly, the share of consumer spending in their total profits is getting smaller and smaller, and the share of an unconsumed *excess* of profits is increasing. At the same time, in comparison with a competitive economy, in the conditions of growing monopolization, the share of the monopoly profit itself in the national income sharply increases. As a result, the *excess* of profit increases so much that due to the over-saturation of their needs, the oligarchs' consumption is unable to commodify the huge purchasing power that is concentrated in their hands. Difficulties arise with the realization of the *excess* of the surplus product.

5. In a competitive economy, normal gross profit and its corresponding surplus product are used for 1) personal consumption of entrepreneurs, 2) government spending (through tax redistribution), and 3) investment. But in today's monopolized economy, monopoly profits are so much greater than normal profits that after spending on entrepreneurs' private consumption and paying taxes, there is still a huge excess.

This surplus cannot be fully used for investment either. Because of the difficulties in selling of commodities, there are problems with finding profitable investment projects. "It is an inescapable truth of the capitalist economy that the uneven, class-based distribution of income is a determining factor of consumption and investment. How much is spent on consumption commodities depends on the income of the working class. Workers necessarily spent all or almost all of their income on consumption. … In contrast, thise high up on the income pyramid – the capitalist class and their relatively well-to-do hangers-on – spend a much smaller percentage of their income on personal consumption. The ovwrwhelming proportion of the income of capitalists (which at this level has to be axtended to include unrealized capital gains) is devoted to investment. It follows that increasing inequality in income and wealth can be expected to create the age-old conundrum of capitalism: an accumulation (savings-and-investment) process that depends on keeping wages down while ultimately relying on wage-based consumption to support economic grouth and investment. ….. Under these circumstances, in wich consumption and ultimately investment are

dependent on the spending of those at the bottom of the income stream, one would naturally suppose that a stagnation or decline in real wages would generate crisis-tendencies for the economy by constraining overall consumption expenditures.".(Foster, ... 2009, 27-28.)

A reduction in the demand for investment commodities for branches that produce final products also reduces the demand for branches that produce investment commodities for the investment branches themselves, and so on. This further reduces employment in investment branches and, accordingly, further reduces wage-based aggregate demand. Positive feedback is triggered, the overall result of which is an accelerated fall in aggregate demand relative to aggregate supply and the stagnation of the economy.

6. The real incentive for entrepreneurs is money, and the production and sale of commodities are only a means for them. Therefore, the excess that is not consumed by either entrepreneurs or the state, and does not find areas for profitable investment in the real sector of the economy, is taken out of it and invested in the financial sector. Thus, part of the money or purchasing power that was created in the process of producing the final product and intended for the purchase of this product is leaking from the real sector of the economy.

Due to the leakage of the excess of the monopoly profit, the equivalent part of the surplus product created in the real sector of the economy remains without solvent demand. Because of this, the equality between the monetary value of the commodities produced, on the one hand, and, on the other hand, the incomes created in the process of their production and intended for their purchase, as required by the conditions of economic equilibrium, is violated. Therefore, it turns out that aggregate supply is greater than aggregate demand. The equilibrium is disturbed, and intra-system disproportions arise. The economic surplus generated by the monopolists does not find a profitable investment area and tends to stagnate. "In a series of articles in *Monthly Review* and in Monthly Review Press books during the 1970s and 1980s, Harry Magdoff and Paul Sweezy proposed that the general economic tendency of mature capitalism is toward stagnation. A shortage of profitable investment opportunities is the primary cause of this tendency. Less investment in the production economy (the "real economy") means lower future growth. Marx wrote about the possibility of this very phenomenon: "But if this new accumulation meets with difficulties in its employment, through a lack of spheres for investment, *i.e.*, due to a surplus in the branches of production and an over-supply of loan capital, this plethora of loanable money-capital merely shows the limitations of *capitalist* production. … obstacle is indeed immanent in its laws of expansion, *i.e.*, in the limits in which capital can realise itself as capital." (Marx-Engels Collected Works,Volume 37 - Marx: Capital III. Moscow. Progress Publishers 1998, p.505.) Stagnation. of course, does not mean that there is no growth whatsoever. Rather, the economy functions well below its potential – with appresiable unused productive capacity and significant unemployment and underemployment." (Foster, ... , 2009, 39.) [132]

7. As a result of the disproportions created by the monopolies, it is not the monopolies that suffer the most but the competitive branches. Because the monopolies sell deficit products, they "pull" the demand for themselves, reducing it for small and medium-sized

[132] "Alvin Hansen (1939) popularized the term "secular stagnation," and we are now, at the suggestion of Larry Summers (2014), considering the application of Hansen's term to the current US economy, because the pace of output recovery in the five years since the business cycle trough of 2009 has been so slow." (Gordon, 2015, 54.)

businesses, thereby depriving them of the opportunity to receive a normal profit. As a result, the average profit in competitive branches is lower than in the absence of monopolies. The decline in profits below normal profits leads to the stagnation of competitive branches.

8. Inequality caused by monopolization is one of the main reasons for the slowdown in economic growth both in developed countries and in the world economy. This is caused by an excessive concentration of purchasing power in the hands of a wealthy minority, which is unable to realize it and withdraws its excess from the real sector of the economy. Society does not have enough purchasing power to present demand for all the commodities produced. The market economy is the economy of mass production. It produces commodities for the whole of society, but under conditions of monopolization it is unable to provide the majority of society with the income necessary for the full realization of the commodities produced. Monopolization leads the market economy into a systemic crisis.

9. The *inequality* born of monopolization also leads to stagnation in the world economy. In the world economy, the capacities of developed countries are underutilized because of weak demand, while poor countries do not have enough funds to demand their commodities. And they do not have enough money because rich countries use their monopoly power to impose on poor countries high prices for their products and low prices for the resources they buy. This imbalance and the weakening of feedbacks between prices in the world markets for products and resources is one reason for the underutilization of developed countries' production capacities and poor countries' insufficient purchasing power.

At the same time, it should be noted that despite this imposition of monopoly world prices and injustice in mutual trade between rich and poor countries, this trade is still mutually *beneficial* for both. For, in terms of national economic values, both poor and rich countries receive certain benefits from such trade (some more, others less). But as unused potential, both those and others, and the world economy as a whole, suffer huge losses.

10. The monopolization of the economy, which began at the end of the 19th century, reached its climax by the 21st century and led the market economy to a systemic crisis. Monopolies are increasingly pushing competition out of the market economy. But a market economy without competition is nonsense. The very idea of a market economy implies spontaneous self-regulation, which is unthinkable without competition. From an economic point of view, competition is not just rivalry. Rivalry is also possible between monopolies. But in a strictly scientific sense, competition and monopoly are mutually exclusive opposites. The main sign of competition is the multitude of producers, none of which can impose their prices on others. Therefore, prices are spontaneously formed by the market itself. But prices are precisely the main factor in the distribution of income. Together with monopoly prices, the distribution of income in favor of monopolies is imposed on society. Hence, the contradiction arises - commodities are produced for the majority, and incomes are appropriated by the minority. A discrepancy arises between the production of commodities and the distribution of income, which slows down the economy.

The competition itself implies that someone wins and someone loses in a competitive struggle. Someone dominates the market, regulates prices in their own interests, and dictates them to the market. Prices are no longer regulated by the market but by monopolies. Monopolization kills the very essence of competition. Market self-regulation is replaced by monopolistic regulation. In turn, it becomes inevitable to supplement regulation by

monopolies (in the interests of individuals) with state regulation (in the interests of the whole society). Otherwise, the monopolized economy would be completely blocked. These became clear already during the Great Depression at the beginning of the 20th century. Thus, the trend of increasing the role of government regulation historically accompanies the trend of growing monopolization.

11. A competitive economy is a self-regulating system of economic actions that always strives for equilibrium, but never reaches it because of the variability of the external environment. A monopolized economy not only does not reach equilibrium but does not strive for it. On the contrary, it preserves a state of disequilibrium and, as monopolization grows, deviates more and more from the state of equilibrium.

4.2. Financialization

1. Competition gives rise to monopolization, and monopolization gives rise to financialization. Under conditions of monopolization, because of enormous inequality, there is an excess of purchasing power for the wealthy minority and its deficit for the poor majority. The former *do not want* to buy consumer products because of a glut of needs, while the latter *cannot* buy them due to a lack of money. Some products are left with no buyer. If the commodities are not sold, finding a profitable investment area becomes increasingly difficult. Therefore, the excess of the purchasing power of monopolists turns out to be excessive both for consumption and for investment in the real sector and profit-making. But profit is the main incentive for entrepreneurs. They invest where there are more profit opportunities. Therefore, income excesses are withdrawn from the real sector and invested in financial operations, where the profit rate is higher.

2. The more money is injected into the financial sector, the more the prices of financial assets, real estate, securities, etc. rise. But this prices rise itself increases the opportunities to profit from financial asset speculation. This increasingly encourages the growth of the average rate of profit in the financial sector and the inflow of money from the real sector, where the rate of profit declines. Thus, the outflow of money from the real sector to the financial sector, caused by monopolization, simultaneously causes both a decrease in the profit rate in the real sector and its growth in the financial sector.

3. Economic activity is increasingly switching to speculative operations. The financial sector is self-expanding. "Finance (banks, investment firms, insurance companies, and real estate consortia) develops an ever-growing number of new ways to try to make money with money – M-M' in Marx's formulation. Thus, finance is not only the "glue" that connects the various parts of the capitalist system and the "oil" that lubricates its workings, finance has become a dominant activity in mature capitalist economies." (Foster, 2009, 54.)

The financial sector is characterized by instability, alternating rises and falls in prices for financial assets. This allows using speculative operations to profit on both ups and downs. But the value of the financial services themselves, which is created in this sector, is negligible compared to the value of the commodities that this sector absorbs for its functioning. There is mainly a redistribution of financial assets. Therefore, some actors' profit comes at the

expense of the losses of others. There is a concentration of funds and increasing inequality. And the economy is becoming more and more "making money with money" than "production of commodities by means of commodities", i.e., more and more becoming the so-called "casino economy".[133]

4. If the money income generated in the production process flows from circulation in the real sector to the financial sector, then production cannot continue in the same volume. Without an additional influx of purchasing power into the real sector, part of the surplus product will remain unrealized, and the economy will fall. Consumer credit and deficit financing can serve as a source of additional purchasing power.[134] But in this case, consumption in debt increases both on the part of consumers and the state. Therefore, money flows back from the financial sector to the real sector.

5. The state itself is the largest monopoly in existence. If private monopolies pump out financial resources from society in favor of a small group of individuals, then the state, on the contrary, redistributes these funds back to society with the help of the tax system and deficit financing. The state finances social programs and makes military orders, thereby supporting falling demand and economic growth. Without income redistribution, a monopolized market economy could not function. The history of the development of a market economy shows that as monopolization developed, the public sector and the scale of redistribution of income for social and military programs increased. In addition to all other motives, this was also necessary from a purely pragmatic point of view to maintain the functionality of the monopolized economy. But the scale of redistribution is insufficient to fully compensate for the excess profits that monopolists withdraw from the real sector because the state itself is under the tacit control of large corporations (which lobby for tax cuts and set limits to state redistribution of income).

6. Before the stagflation of the 1970s, falling demand caused by the leakage of excess monopoly profits was supported by the tax system and budget deficits financed by government debt or money issue, and after stagflation, by credit expansion. Accordingly, before stagflation, Keynesian policies were pursued, and after it, neoliberal policies. The financialization of the economy is a consequence of neo-liberal policies, which, after the stagflation of the 70s, replaced the long-term Keynesian policies of the post-war period. But one way or another, the artificial financial support of demand was and remains necessary to prevent stagnation.

7. In the context of lagging demand behind supply and the absence of profitable investment projects, the structure of loans issued has changed significantly. Demand for loans for productive investment has fallen sharply, while the share of consumer loans has risen to enormous proportions. In such conditions, when the production of commodities does not increase, but the artificially supported demand for commodities increases, the prices of commodities rise. Although producers' incomes increase because of rising prices, the

[133] "As the economy of production of goods and services stagnate, failing to generate the rate of return from M-C-M' that capital desires, a new type of "investment" has emerged. It seeks to leverage debt and embrace bubble-like expansions aimed at high, speculative profits through financial instruments. The depth of stagnation, and its tenacious hold on the mature capitalist economy, is amply testified to by the flight of investment into what we have called "the giant casino"." (Foster, 2009, 61.)

[134] In this case, we consider a closed economy and do not take into account external economic relations..

increased incomes are again distributed in favor of large monopolists and not medium and small businesses. Their incomes rise even more, and they invest the monopoly surplus in the financial sector even more and, in doing so, reproduce the scarcity of purchasing power in the real sector on an increased scale. As a result of these processes, prices rise, but the gap between demand and supply does not disappear.

8. A wealthy minority enforces high standards of consumption in society. In the absence of adequate income, orientation to these standards forces the majority of society to resort to consumer loans, mortgages, car loans, etc. The increased consumer demand for loans, on the one hand, and low investment demand, on the other hand, cause the redirection of credit resources from the sphere of production to the sphere of consumption.

That is, a new pattern of money flow emerges. On the one hand, part of the money of the wealthy minority flows from the real sector to the financial sector, and on the other hand, part of the money from the financial sector returns to the real sector in the form of consumer credits for the poor majority. Both the interest rate and fluctuations in economic activity in the real sector largely depend on the ratio of outflows and inflows of money.

9. Because of the difficulties of investing in production, fewer credits are issued for production purposes and more for consumer purposes. But, at the same time, if crediting of production investment creates incomes from which credits will be serviced, then credits for consumption do not create new income sources to cover themselves. But if new sources of income are not created to service credits, then consumption expenditures will have to be reduced from future incomes which will resume the decline in demand and the economy as a whole. The economic downturn is only shifted from the present to the future.

Thus, along with the credits, financial bubbles and financial instability are involuntarily built into the monetary circulation of the real sector. But these are already recessions that are periodically generated by the financial system and have an unpredictable character. For it is impossible to predict when the “Minsky Moment” and the sudden loss of confidence by market participants will come; that is, it is impossible to predict when the financial bubble will burst.

10. Money taken on credit is not the property of the debtor. But when the debtor buys commodities with borrowed money, i.e., other people's money, then this money becomes the seller’s property. Therefore, monopolists, selling commodities paid for by credits, receive money as their property. That is, by withdrawing surpluses from the real sector to the financial sector, they withdraw their own money. But buyers buying commodities, are increasingly buying them with borrowed money, i.e., other people's money attracted from the financial sector. It turns out that some oligarchs *withdraw* their own money from the real sector while others *inject* it back into the same sector, increasing the debt overhang and enslaving society with debt.

More and more consumers are becoming increasingly indebted to a small group of financial magnates. And society is becoming more and more debt-consuming. Wage-based demand is increasingly being replaced by credit-based demand. This leads to financial instability. In addition, the real sector is becoming increasingly dependent on the financial sector, which supplies it with credits, which, on the one hand, sucks money out of it, and on the other hand, pumps it with credits. And this process cannot cease, otherwise, the whole economy will be blocked.

11. *Excess savings* of monopolists that are not used in the real sector arise through the monopoly redistribution of incomes, resulting in the formation of *negative savings* of consumers. And this excess of expenses over incomes has to be paid by debts. If, before monopolization, savings from the consumption sector flowed into the production sector for productive investment, then under monopolization, on the contrary, surpluses of monopoly profits from the production sector (through the financial sector) flow into the consumption sector to finance consumer demand. But investing in physical capital increased productive potential and developed the economy, while investing in consumption does not contribute to this. Investing in consumption becomes necessary only to temporarily prevent a recession.

12. From the above, it turns out that the financial sector begins to work as a "financial pump". It sucks money out of the production sector and, in the form of credit resources, pumps it into the consumption sector.[135] This allows the economy to function but does not allow it to grow. This process cannot be ceased. For in conditions where the tendency for demand to lag behind supply is built into the mechanism of the functioning of the economy, supporting demand with credit resources becomes necessary to prevent a recession. At the same time, to maintain acceptable economic growth rates, the growth rates of credits should outpace them. "For 50 years, private- sector leverage — credit divided by GDP— grew rapidly in all advanced economies; between 1950 and 2006 it more than tripled. … Leverage increased because credit grew faster than nominal GDP. In the two decades before 2008 the typical picture in most advanced economies was that credit grew at about 10– 15% per year versus 5% annual growth in nominal national income. And it seemed at the time that such credit growth was required to ensure adequate economic growth. … We seem to need credit to grow faster than GDP to keep economies growing at a reasonable rate, but that leads inevitably to crisis, debt overhang, and postcrisis recession." (Turner, 2016, 7.) The process results in a tendency for the financial sector to grow and the real sector to stagnate. But the credit expansion of commercial banks is not the solution as such.

13. Counter flows of commodities and money form prices in the markets of products and resources. The feedback between the prices of products and resources underlies the self-regulation of a market economy. But when, on the one hand, money flows out of the real sector uncontrollably, and on the other hand, it flows in from outside, and these inflows and outflows are not balanced in any way, then the feedback between prices is distorted. Moreover, as will be shown below, in contrast to a competitive economy, not all purchasing power is created in the very process of producing commodities, but a huge part of it is created "out of nothing" in the form of bank credits in the financial sector. The very idea of self-regulation based on counter flows of commodities and money and a feedback system is dying. For, there is instability in the circulation of money. Price movements in the market of final products and in the market of primary resources are not synchronized. Equality is

[135] The result of this process is that since few credits are issued for productive investment, we have a "secular stagnation" of the economy, and since consumer credits are booming, we have inflation. But stagnation accompanied by inflation is stagflation. The economy is moving towards "secular stagflation". This is what exactly monopolies do, for, they reduce production and increase prices. In the context of slowing economic growth - 1) due to increased inequality, the state is forced to increase deficit financing of social programs, thus contributing to inflation; 2) credit expansion is growing to maintain demand which also contributes to inflation. "Secular stagflation" is a consequence of these processes.

violated between the total monetary value of commodities produced and the income necessary for their sale.

14. More and more money is pumped into the real sector from the financial sector. Since commercial banks create credits out of "air", it all looks like inflating a financial bubble, which must inevitably burst and give rise to a financial crisis, which often escalates into an economic crisis. Waves of financial instability "rock" the real sector of the economy, periodically bringing it to a crisis.

Cyclical fluctuations in a competitive and monopolized economy have various causes. In a competitive economy, these are periodically arising branch imbalances that are eliminated with the help of crises. But in a monopolized economy, these imbalances are conserved and distort money flows, which periodically give rise to financial bubbles and escalate into economic crises.

Financialization leads the market system to the end of its existence. Adequate economic policy can slow this process down, but it cannot be reversed in the same way as the monopolization itself that gave rise to it. The economy seems to be more and more drawn into the funnel of an attractor, leading to a deep systemic crisis. A crisis of the market system itself, based on private property, competition, and self-regulation, is brewing. A market economy cannot long coexist with monopolies, robotic production and AI, huge abundance of goods, digitalization of money and economy, universal basic income, etc. Therefore, its replacement by a new, more adequate economic system is a historical inevitability.

4.3. Banking system

1 . The existing fractional reserve banking system plays a huge role in the destruction of feedbacks and mechanisms of self-regulation of the economic system. The ideas spread in society about modern money, credit and the banking system radically differ from reality. The textbooks indicate that: 1) banks are mere intermediaries between savers and borrowers; 2) banks issue credits to entrepreneurs for investment in business projects. Both statements are false.

2. Issuing credit implies that the thing issued as a credit (whether it be a thing or money) is physically withdrawn from the use of one subject and transferred for use to another subject. However, when issuing credits by modern banks, there is no transfer of the right to use money from one subject to another. As Richard Werner writes: "The money was not withdrawn by the bank from other uses. It was not diverted or transferred from any other part of the economy. Most of all, although it is shown as a deposit, it was not actually deposited by anyone. The bank simply created the money by writing the figures into its books and the customer's account book. In effect, the bank pretends that its borrower has made a deposit that was not actually made. Unlike the textbook representation, we see that each individual bank can thus create money when it extends a loan. … The bank just pretends it has the

US$9900, credits someone's books with them, and nobody knows the difference." (Werner, 2005, 178.) [136]

What banks do is like trading in securities. When a customer signs a credit agreement, according to the law a security is created. This is a promissory note of the client to the bank. The bank buys this promissory note from the client and pays for it with a counter-obligation. The bank opens a demand deposit in the client's name. This newly opened deposit is precisely the new money, the new purchasing power, which the bank has created from "nothing" by simply writing numbers into the client's deposit account. This money was not transferred from anywhere to this account. All this suggests that banks are not just intermediaries between savers and borrowers but creators of money.

3. It is not true that textbooks claim banks lend to entrepreneurs to invest in production. With the stagnation of the economy, the share of credit issued for productive investment has fallen sharply. "With very few exceptions, the banks' primary business consisted of non-mortgage lending to companies in 1928 and 1970. In 2007 banks in most countries had turned primarily into real estate lenders. . . . The intermediation of household savings for productive investment in the business sector— the standard textbook role of the financial sector— constitutes only a minor share of the business of banking today." (Jorda, ... , 2014, 2, 10.) History shows that banks prefer to issue credits for financial and speculative operations, for buying real estate, which quickly yield profits, and are associated with little risk.

4. From the point of view of the impact on purchasing power or on prices, bank money or electronic money, in the form of credit, does not differ from cash. "As soon as we realize that there is no essential difference between those forms of 'paper credit' that are used for paying and lending, and that demand, supported by 'credit,' acts upon prices in essentially the same manner as does demand supported by legal tender, we are on the way toward a serviceable theory of the credit structure and, in particular, toward the discovery of the relations between prices and interest." (Schumpeter, 2006, 718.) In today's economy, over 95% of transactions occur "from account to account" and not "from hand to hand." Therefore, everything comes down to manipulating the numbers stored in the memory of computers. But to meet requirements for cash, banks need very little reserves because, in the real economy, the cost of cash transactions is less than 5%. But ignoring this circumstance in theory and, accordingly, in economic policy, cannot remain without highly negative consequences.

5. If money is created during issuing of credits, then they are also destroyed when the debts are repaid. During the entire period, from issuing credits to the return of debts, banks receive interest. Banks must constantly create new credits in order to be able to replace the

[136] "These banking Credits are, for all practical purposes, the same as Money. They cannot, of course, be exported like money: but for all internal purposes they produce the same effects as an equal amount of money. They are, in fact, Capital created out of Nothing " (Macleod, 1906, 408). "…the bank has monetized credit. It has created purchasing power which did not exist before, since it has supplied the borrower with a means of paying his debts, without in any way reducing the amount of money in the hands of the other members of the community. Each addition to the existing volume of bank loans, therefore, results in a net increase in the total supply of money in the community, and any diminution in that volume will decrease the total volume of money" **(**James, 1930, 194.) "When a bank grants me a $1000 loan, and so adds $1000 to my checking deposit, that $1000 of 'money that I have in the bank' is new. It was freshly manufactured by the bank out of my loan and written by pen and ink on the stub of my check book and on the books of the bank... Except for these pen and ink records, this 'money' has no real physical existence." (Fisher, 1935, 3.)

returned debts. Depending on the propensity for risks, how actively new credits are issued, how many debtors repay debts, and the pessimistic or optimistic mood of banks, the money supply in the economy, aggregate demand and, accordingly, economic growth rates will increase or decrease. In order to better understand the importance of this problem, let us consider it in more detail and follow the logic of credit relations.

6. Loans not backed by real savings weaken the market's ability to self-regulation. In a market economy, subjects produce commodities for each other and then exchange them. But different commodities require different times for production. Since the production of some products takes a long time, then, until the end of the production process, their producers are forced to consume in debt daily many other products (production and consumer commodities). During all this time, they become debtors. Those who provide them with these products and resources for daily consumption become creditors. The debtors will pay the debt with the produced products after their production is completed. Accordingly, until they are paid, the resources and products they consume daily must be saved from current consumption by those who provide them with credit. That is, the same exchange of products takes place, but based on credit relations. This is what happens in barter. In the case of a monetary economy, the essence of the crediting process does not change. Only credit is given in money. With this money, the debtor buys the products and resources he consumes daily. And upon repayment of the debt, he will first sell his product and with the money from the sale, he will return the debt along with interest.

The emergence of the banking system will also not change the essence of credit relations. The bank, in theory, is just an intermediary between savers and borrowers. The savers provide the bank with their savings as credits, and the bank provides the credits to its borrowers. That is, the bank itself is both a borrower and a creditor. For intermediary services, the bank receives compensation in the form of the difference in interest paid by borrowers and paid to savers.

Resources issued as credits, whether real or monetary, represent the real purchasing power with which its owner can present a demand for any other goods of equivalent value. In general, issuing a money credit to a borrower means that the creditor temporarily renounces the use of the purchasing power of the money issued on credit and temporarily transfers this right to the borrower. But behind this entire process, exchanging some goods for others is still implied. Although both the issuance of credits and the repayment of debts take place in money, behind them are real commodities equivalent to them in value. Cash flows only mirror the movement of commodity flows.

7. The functions of the bank change fundamentally when it begins to create money “out of nothing” and issues it to borrowers as credits. Such an opportunity appears in the system of fractional reserve banking. Here, the money that is issued as loans is not backed by savings of real goods. The borrower gets the opportunity to present a demand for real goods, although he will pay for their value with “papers” that are not secured by real goods. He exchanges that which has no value for that which has a real value; “nothing” exchanges for real goods. He wedged into relations between producers who produce goods for each other. Thus, without compensation, he appropriates a certain part of the products and resources intended for other producers producing other goods. Accordingly, these producers will not be able to produce in the proper volume the products that they produced according to their

specialization within the existing division of labor. Thus, issuing credits that are not secured by real savings disrupts the coordination between the economic actions of subjects interconnected by a single system of division of labor. This undermines the very principle of the organization of economic life, according to which everyone produces for others and consumes what is produced by others.

8. Owners of unsecured money appear, who demand real goods and offer nothing in return. The *law of value*, the very principle of the equivalent exchange of commodities on which market self-regulation is based, is violated. Feedbacks between the prices of final products and primary resources are destroyed. The proportions of the exchange of commodities are distorted, that is, relative prices are distorted. The market begins to generate false signals for economic actors. The interest rate drops sharply, the correspondence between it and the average rate of profit and the average savings rate is violated. The total value of commodities produced no longer corresponds to the income received in the process of their production and sale.

9. Created out of "air" money, credit and purchasing power give rise to "financial bubbles" that eventually lead the economy to an economic crisis.[137] And the reason for all this is the fractional reserve banking system. This process was analyzed deeply by Ludwig Mises, Knut Wicksell, Irving Fisher, Friedrich Hayek, and other well-known economists. "A lowering of the gross market rate of interest as brought about by credit expansion always has the effect of making some projects appear profitable which did not appear so before. … (Mises, 1996, 561) The essence of the credit-expansion boom is not overinvestment, but investment in wrong lines, i.e., malinvestment. The entrepreneurs …. embark upon an expansion of investment on a scale for which the capital goods available do not suffice." (Ibid, 559.)

10. As already noted, when credits are issued, money is created, and when debts are returned, they are destroyed. However, interest accrues on the credits. This means more money must be returned to the bank than was created when issuing credits. Clearly, in individual borrowers' cases, the source of interest payments is their future earnings. But if we consider the economy as a whole, the logic of the processes changes. In general, more money must be returned to the banking system than was issued as credits. And since 95% of the money in circulation is bank money created at the time of issuing credits, then the money needed to cover interest also needs credits, on which interest also accrued, etc. As a result, the amount of interest and credits is constantly growing. Accordingly, the money supply and inflation are increasing, and the purchasing power of money is decreasing.

11. If at the micro-level, each private bank itself creates and distributes money and purchasing power, this means that at the macro-level, the distribution of money and purchasing power in the economy depends on the decisions and interests of private banks. Therefore, commercial banks' collective interests and decisions largely determine which branches of the economy will make investments, which branches will develop, what will be the ratio of exports and imports, employment, inflation, growth rates, etc. In fact, the owners

[137] "This power to create money, in the hands of commercial banks, has been highlighted as one of the root causes of both the Great Depression of the 1930s and the financial crisis of 2007-2009." (Dyson, …, 2016, 3.)

of commercial banks, a small group of individuals, based on their private interests, informally decide how the national economy, and even the world economy, should develop, even though no one has given them this right. The banking system itself gave them the opportunity to do so.

12 As we can see, not only large corporations in the production sector, but the entire banking system, jointly block the mechanisms of market self-regulation and reallocate resources in their own interests, increasing economic inequality. The creation of deposits and issuing banknotes "generate considerable assets for banks, who gradually take this wealth from all economic agents in the market through a process the agents cannot understand or identify, one which leads to small decreases in the purchasing power of the monetary units all use in society. Credit expansion is backed by the creation of new deposits or bills, …, In this way banks appropriate a large volume of wealth, which from an accounting standpoint they guarantee with deposits or bills that permit them to disguise the fact that economically speaking they are the only beneficiaries who completely take advantage de facto of these assets. Thus they have found a perennial source of financing which will probably not be demanded from them, a "loan" they will never have to return (which is ultimately the same as a "gift"). (de Soto, 2009, 248.)[138]

13. Permanent inflation caused by credit expansion leads to a permanent decrease in the purchasing power of money deposited in banks. Therefore, from banks, depositors receive back depreciated money, that is, less purchasing power than they deposited in the bank. But, this process is less noticeable because of the constant increase in productivity and the decrease in the cost of final products. However, this decrease in the cost of final products is not reflected in the decrease in their prices. Thus, inflation absorbs the results of technological progress. Technological progress and the abundance of goods it generates is the patrimony of society. But under the guise of artificially provoked inflation, the banks appropriate these progress results.

So, summing up, we can state: instead of society enjoying the benefits of technological progress, its results are appropriated by banks and monopolies. Banks raise prices by increasing the amount of fiat money, and monopolies – by reducing the number of commodities produced and creating scarcity. But rise in prices with stable wages increases their profits, thereby increasing inequality and the problems associated with it.[139]

[138] "In short, banks amass tremendous wealth, mainly by generating means of payment to the detriment of third parties. The harm done is very generalized and diluted, however, and takes the form of a gradual relative loss of purchasing power. This phenomenon occurs constantly and stems from the banking system's *ex nihilo* creation of means of payment. This continuous transfer of wealth to bankers persists as long as the banking business suffers no disruptions and assets keep increasing bankers' balances in the form of loans and investments backed by the corresponding deposits created from nothing." (de Soto, 2009, 196-197.)

[139] According to statistics, in developed countries, real wages have not actually increased since the 1970s, although labor productivity has not stopped growing. However, according to the existing economic regularity, real wages should grow along with labor productivity growth. This relationship between wages and labor productivity is reflected in the "Symmetric Model". In this model, technological and consumer coefficients are inversely related to each other. This means the decrease in technological coefficients caused by technological progress leads to an increase in consumer coefficients. This means an increase in real incomes and well-being.

Instead of conclusion

1. In a market economy, those incomes (purchasing power) are created in the very process of producing commodities, that are needed to buy them. Incomes of production factors (Wages, Rent, Profit) are those primary incomes based on which the aggregate demand for produced commodities is formed. If the aggregate demand is insufficient for their realization, the economy will begin to decline. Therefore, a necessary condition for the normal functioning of the economy is not only the correspondence of the gross product and gross income but also the correspondence of the structure of production to the structure of solvent needs, which is necessary for the correspondence between aggregate demand and aggregate supply. Although the economy is never in a state of equilibrium where such a correspondence is achieved, thanks to competition, it constantly strives for it. Behind the sharp fluctuations between economic ups and downs, one can only imply such an equilibrium state, which, like an "attractor", pulls the economy to itself from whatever state it is which it actually in at that moment. Thanks to this mechanism of functioning, the competitive market economy has provided enormous progress in the development of society. Over time, competition itself gives rise to a monopoly, which deforms this economic mechanism and hinders further development.

2. At the turn of the 19th and 20th centuries, significant changes took place in the economies of developed countries. Second half of the 19th century and the beginning of the 20th century is a period of the Second Industrial (Technological) Revolution. Industrial giants were being created, and the technological base of production was being updated. All this required huge finances that were not available to individual investors. Therefore, joint-stock companies began to appear, accumulating the capital of many owners. At the same time, through the acquisition of controlling stakes in joint-stock companies, banks could exercise control over entire branches. The consolidation of enterprises took place more and more actively. Centralization and concentration of capital created all the conditions for monopolization. The competitive economy has more and more obviously transformed into a monopolized one.

The first clear sign of the structural deformations that had taken place, caused by monopolization, was the crisis of 1873. This was profound and prolonged crisis, and its dynamics clearly differed from previous cyclical crises that took place in a competitive environment. This was the beginning of the era of monopolization. The ultimate confirmation of the complete dominance of large monopolies was the Great Depression of the 30s, which began in the United States, swept the world economy, and lasted 10 years.

3. In a competitive economy, demand lagged behind supply during the downward phase of the economic cycle, which caused prices to fall. At the bottom, structural disproportions were eliminated and economic recovery began, prices began to rise again and

the formation of a new, more adequate branch structure of the economy began. But in a monopolized economy, the shortage of demand is born not by periodic fluctuations in economic activity, but by the increased inequality in income distribution caused by the monopolization itself.

Using their monopoly power, the monopolies artificially create shortages, inflate prices and make super profits. This means that in the products they produce, the cost per unit of utility is less (respectively, the utility per unit of cost is greater) than the average for the economy. Thanks to this, monopolists can make profits that are much higher than the average rate of profit and in this way redistribute national income in their favor by reducing the income of other economic subjects. Huge income inequality appears. The profits of the monopolists far exceed their personal needs, most of which are saved. On the other hand, the relatively low incomes of most consumers lead to a weakening of demand. Commodities are not sold, and prices are falling. The wealthy minority has a surplus of savings, and the poor majority has a shortage of money. There is a situation when "the rich *do not want* and the poor *cannot* buy goods". Because of weaker demand, monopolists cannot invest the excess savings in the real economy, and they withdraw them from the real sector to the financial sector for speculative operations. The leakage of money causes demand to drop relative to supply, and the economy's growth rate falls. This scenario caused by monopolization was the real cause of the world crises of 1873, especially the Great Depression.[140]

Under the conditions of liberal economic policy, because of monopolization and inequality, the shortage of demand was no longer of a periodic nature associated with cyclical fluctuations, but took on the form of a trend of a permanent nature. Such a steady gap between demand and supply, although it can increase or decrease depending on the economic situation, gives rise to a general trend toward economic stagnation. It is an irreversible process, for monopolization cannot go back to the competition from which it was born.

4. The reaction to the Great Depression was the Keynesian theory, based on which the counter-cyclical policy was developed. At the same time, Keynes assumed that the Great Depression was the another crisis of the economic cycle, although the deepest of all the previous ones, because of the loss of price and wage elasticity. He did not consider it a manifestation of the systemic crisis of the capitalist economy in general. Keynes believed crises arise because of fluctuations in the marginal efficiency of capital. He did not believe that economic inequality causes a *constant* outflow of money from the real sector to the financial sector and that this circumstance is a factor that is the reason for the *constant* lagging of demand behind supply. Therefore, he did not consider that demand *constantly* needed artificial stimulation. He believed this should only be done *periodically*, when required by the downward phase of the economic cycle.

The neo-Keynesians also did not believe that the structural deformation of the economy caused by monopolization gives rise to a structurally determined tendency for aggregate

[140] During financial bubbles, which often become triggers for economic crises, only the self-stimulation of the process occurs. For the more money flows from the real sector to the financial sector, the faster prices rise in financial markets, which creates favorable conditions for speculative transactions. This further exacerbates the financial leakage and weakens demand and investment opportunities in the real sector. Financial markets are self-stimulating and demand is booming. But when the bubble collapses and the prices of financial assets fall, the owners of these assets feel poorer (Pigu Effect) and further reduce consumer and investment spending. The economic crisis is becoming inevitable.

demand to lag behind aggregate supply permanently. From this, it is clear that the counter-cyclical policies subsequently developed by the neo-Keynesians were intended not only to mitigate periodic downturns but also to limit the excessive economic booms generated by the cycle. Accordingly, with the help of budget deficits and surpluses, the Government had to regulate demand - stimulating it during a crisis and weakening it during booms. However, in practice, it turned out that the economies of developed countries almost constantly had to be stimulated by maintaining demand and not by keeping them from overheating.

5. Keynes' widely quoted remark that "in the long run we will all die" resulted from an underestimation in his conception of the long-term results of such a policy. But in reality, it was the long-term period that turned out to be the "vulnerable point" of his counter-cyclical policy. Ignoring them just became one of the main factors of stagflation in the 70s.[141] For, the leakage of excess savings of monopolists from the real sector occurred constantly. Accordingly, the demand was constantly weakening, and was also had to be artificially stimulate by deficit financing constantly, that is, just in the long term. But such a policy gave rise to inflation and led to incorporating inflationary expectations into the functioning of the economy and, at the same time, for a long time prevented the economy from entering into a crisis and eliminatting structural deformations. The crisis was constantly being suppressed. And this meant not the elimination of structural disproportions but their conservation, postponing their elimination to an indefinite future. At the same time, the Keynesian policies of stimulating demand turned out to be an inadequate response to the "cost shock" generated by the rise in oil prices in the 70s. The result of this was stagflation. Disproportions burst out at once during stagflation, exactly before which the Keynesian policies proved powerless.

6. The sharp rise in oil and oil products prices in the 70s led to an increase in production costs. Now goods could only be produced at high costs and sold at high prices. This created great difficulties for the economy as a whole. However, price takers and price makers react differently to such conditions. Small and medium businesses that dominate the competitive sector of the economy find it more difficult to maintain production and income than large corporations that dominate the monopolized sector and operate based on long-term contracts. Inequality is rising sharply and the middle class is shrinking. There is a consolidation of enterprises. This supports the general trend of increasing monopolization. And the Keynesian policy of pumping money into the economy to stimulate aggregate demand gave birth to a wage-price spiral, and the rate of inflation rose rapidly.[142]

[141] Although the "oil shock" triggered stagflation, its underlying cause was the monopolization of the economy (including global oil production), inequality, and the Keynesian policy of deficit financing generated by them.

[142] The sharp rise in costs is splitting the economy in two. The monopolized and competitive sectors react differently to rising costs. In a monopolized sector, price makers continue to produce goods and pass on high costs to prices. This allows them to preserve sufficient income to maintain market demand in a high-price environment. In a competitive sector, price-takers cannot pass on costs to prices. Therefore, the production and supply of goods are reduced in the competitive sector. Accordingly, the income of those employed in this sector is declining. However, their solvency is reduced to a much greater extent due to the sharply increased prices caused by the "shock of costs". In such conditions, in order to maintain solvency, they are forced to take credits, spend savings, and use income from the sale of assets. Thus, the decline in output in the competitive sector is not sufficiently reflected in the reduction in demand from those employed in this sector. Generally, a situation arises when the volume of production in the economy is reduced (especially in the competitive sector). Nevertheless, the demand for goods is more or less preserved (on the part of agents of both sectors). But cost-driven price increases and production cuts, while credit-supported demand persists, provoke stagflation. And if

7. The coexistence of inflation and unemployment created a situation in which the Keynesian policy was powerless. This led to the discrediting of Keynesian policies and it was replaced by neo-liberal policies, which shifted the focus from government *regulation* to market *self-regulation*. The basic principles of the policy pursued by neoliberalism have been called the Washington Consensus.[143] The continued dominance of neoliberal politics has led to an intensification of the process of monopolization and financialization, an increase in inequality, and an increase in intra-system deformations.[144]

Disproportions, which accumulated over a long period, eventually had to break out. The formation of financial bubbles and the subsequent global crisis of 2008 were inevitable consequences of neoliberal policies. The crisis began in the United States and spread to all developed countries. "Yet however much Wall Street's daredevil antics in the 1920s and in the 2000s were proximate causes of the giant bubbles of these two eras, the bubbles also reflected the deeper problems …. — the growing imbalance between what most people earned as workers and what they spent as consumers, and the increasingly lopsided share of total income going to the top. In both eras, had the share going to the middle class not fallen, middle-class consumers would not have needed to go as deeply into debt in order to sustain their middle-class lifestyle. Had the rich received a smaller share, they would not have bid up the prices of speculative assets so high." (Reich, 2013, 34.) This reasoning holds true for other developed countries as well. Inequality, sharply increased due to neo-liberal policies and the shrinking middle class, weakens demand and slows down the economy.[145]

8. According to the neo-liberal concept, a state controlled by oligarchs pursues a "trickle-down" policy, according to which, tax cuts on business will increase investment and jobs and thus, the workers' incomes. However, because of lower tax rates, the highest income recipients benefit the most. This increases the wealth of the rich and increases inequality. Therefore, this policy is counterproductive because excessive inequality is precisely the cause of stagnant phenomena in the economy. Therefore, the supply-sider policy did not have the expected effect.

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we take into account that all this is happening against the backdrop of permanent inflation generated by the banking system, and, in addition, if the Keynesian policy of stimulating demand is the reaction to the reduction in production, then the acceleration of inflation in conditions of stagnation, that is, stagflation becomes inevitable. As a result of stagflation, small and medium-sized businesses shrink, while large businesses survive; the share of the competitive sector is decreasing, while the share of the monopoly sector is increasing; the poor get poorer, and the rich get richer.

[143] The Washington Consensus was supposed to provide economic growth for all and overcome global stagnation. But the stagnation of the industrial sector continued. "The surge upward of the stock markets everywhere was based not on productive profits but largely on speculative financial manipulations. The distribution of income worldwide and within countries became very skewed — a massive increase in the income of the top 10% and especially of the top 1% of the world's populations, but a decline in real income of much of the rest of the world's populations." (Wallerstein, 2008.)

[144] "The rise of inequality has been one of the most profound changes in modern societies since the early 1980s. … since the early 1980s the rise of Neoliberalism has brought about important economic and societal changes, including the deregulation of financial sector … Several macroeconomic imbalances have emerged: …. These imbalances are at the root of the crisis. They have been facilitated by financial deregulation, but most of them are intrinsically linked to the rise of inequality." (Stockhammer, 2012, 2 - 3.)

[145] "Unless America's middle class receives a fair share, it cannot consume nearly what the nation is capable of producing, at least without going deeply into debt. And debt on this scale is unsustainable, as we have seen. The inevitable result is slower economic growth and an economy increasingly susceptible to great booms and terrible busts." (Reich, 2013, 140.)

9. Jobs create market demand, just as demand creates jobs. More generally speaking, production and consumption, supply and demand, and incomes and expenditures depend on each other. If the balance between them upsets, the economy will begin to slow down. Economic growth is slowing down not because the producers do not have enough money but because the vast majority of the society for which commodities are produced, does not have enough money because of an incorrect distribution of income. If money is pumped into the real sector of the economy instead of redistributing income in order to increase demand, then demand will begin to grow; however, inflation will also gradually increase, and the actual purchasing power of society will decrease again. But consumers' spending is corporates incomes. Therefore, inflation will increase, but income inequality will not decrease. Corporations will still withdraw excess profits to the financial sector, and everything will repeat itself at increased prices.

10. Since the lag in demand arises because of the outflow of money from the real sector, the financial sector compensates for this outflow of money by credit expansion. Money is pouring into the real sector as credits and revitalizing sluggish demand. Demand rises again and the rapid growth of the economy begins. But in a decentralized economy, no one controls the ratio of inflow and outflow of money in the real sector. Therefore, first, ups and downs in economic activity are not eliminated, and second, on the wave of optimism, credit expansion gives rise to a financial bubble, which eventually bursts and gives rise to a financial crisis, which in turn develops into an economic crisis.

11. As we can see, both the Keynesian policies pursued before the crisis of the 1970s and the neoliberal policies pursued after it proved ineffective. The first ended in stagflation, and the second ended in the Great Recession. The reason for their failure is that neither of them took into account the bifurcation of the economy into competitive and monopoly sectors and the scale of inequality generated by this. Both of these policies pursuing an anti-crisis policy, preventing the economy from entering such a deep crisis to eliminate the accumulated structural deformations. Thus, crises are postponed "for later". But later, very deep crises appear with very severe consequences, during which the elimination of deformations accumulated over a long period of such anti-crisis policy occurs.

12. Just as in the domestic market, producers buy labor at relatively low prices and sell products to them at high prices, so on the external market, using monopoly power, large corporations buy resources from poor countries at relatively low prices and sell their products to them at relatively high prices. That is, they do not give poor countries enough money to buy goods from developed countries. This reinforces the economic inequality between rich and poor countries. Accordingly, there is also a shortage of demand in world markets. Therefore, loans are given to poor countries so that they can buy goods from rich countries. That is, similar processes are taking place in foreign and domestic markets. In both cases, the feedback between production and consumption is disrupted, and everyone suffers the damage.

The competition itself gave rise to monopolization, which, in turn, gave birth to inequality and the logic of the development of events that followed. Namely, because of inequality, on the one hand, there is an excess of savings, and on the other hand, a shortage of domestic demand. With a shortage of demand, savings cannot be invested in the real sector of the economy within the country. Therefore, the need for foreign markets is escalating. This

leads to a conflict of economic and political interests of various countries and military conflicts.

13. As a result of neoliberal policies, the polarization between rich and poor is increasingly growing both within and between countries. The degree of inequality in the world and in individual regions can be judged from the data provided in the World Inequality Report 2022. As of 2021, the top 10% of the world's wealthiest people owned 76% of all household assets and received 52% of total income. The bottom 50% of the world's population owned 2% of the wealth and received 8% of total income.[146]

In the neoclassical paradigm, the influence of distributive relations on the efficiency of the economy is clearly underestimated. However, in reality, the problem of inequality is one of the main reasons for the stagnation of the economy. For, in the economy, products are produced to meet the needs of the whole society, but the money needed to purchase them is concentrated in the hands of a relatively small group of people. The economy is slowing down. It is impossible to eliminate this problem either by Keynesian or neoliberal methods. The source of all problems is the deformation of distribution relations caused by monopolization, the discrepancy between the production of products and the distribution of income. [147]

14. Every producer tries to save on labor and resource costs. in pursuing profit; tries to replace labor with machinery, hires cheaper labor, uses immigrant labor. If all producers reduce workers' wages and replace their labor with machinery, then the purchasing power of workers will decrease. They make up most of the consumers; and commodities are produced for them. Commodity production is mass production. If most consumers do not have enough income, they cannot buy the commodities produced and the economy will decline.

15. In order to reduce costs and increase profits, production is moved from developed countries to developing countries where there is cheap labor and resources. The result is even more significant reductions in jobs, wages, and purchasing power in the developed countries themselves. On the other hand, due to low wages and low resource prices, poor countries do not have the sufficient purchasing power to present a high demand for the products of developed countries. Therefore, developed countries are losing both their domestic and foreign markets, and remain without sufficient demand for their products. It turns out that in pursuit of profit, producers produce more and more commodities for consumers but give them less and less money to buy these commodities. This is a systemic contradiction that leads the economy to a dead end.

Society needs commodities, and producers of commodities need money. Producers, using monopoly power, distribute the national income in their favor. By appropriating more

[146] World Inequality Report 2022, World Inequality Lab, p. 10.

[147] "…. income distribution will have to be a central consideration in policies dealing with domestic and international macroeconomic stabilisation. The avoidance of crises similar to the recent one and the generation of stable growth regimes will involve simultaneous consideration of income and wealth distribution, financial regulation and aggregate demand. It is this first element – the distribution of income and wealth – that has not conventionally been incorporated in macroeconomic analysis. Put more bluntly, creating a more equal society is not an economic luxury that can be taken care of after the real issues, such as financial regulation, have been sorted out. Rather, a far more equitable distribution of income and wealth than presently exists would be an essential aspect of a stable growth regime: wage growth is a precondition of an increase in consumption that does not rely on the growth of debt. And financial assets are less likely to be used for speculation if wealth is more broadly distributed." (Stockhammer, 2012, 18.)

and more money, they cut the incomes of the bulk of consumers who cannot buy commodities. But without purchasing commodities, producers cannot get the money for which they produce these commodities. In monopolization, with their greed, they block the economy, while in conditions of competition, it was precisely this greed that developed it.

16. Given the above circumstances, it is necessary to establish the maximum allowable rate of profit for monopolies and oligopolies, and, on the other hand, to reduce taxes for small and medium-sized businesses sharply. And if necessary, apply "negative taxation" for small businesses. If the excess of profit over the profit rate established by law is withdrawn to the budget, then the very logic of the behavior of monopolies will change. They will begin to increase the mass of profits not by reducing the output and raising prices but, on the contrary, by increasing the output and lowering prices. In order to sell more and make a larger mass of profit, the monopolist needs to lower prices. And along with lower prices, they will also reduce costs in order to get the maximum possible profit without violating the rate of return allowed by law. Thus, the monopolists will not be interested in creating a deficit or producing a surplus. In the first case, part of the income that exceeds the allowable profit rate will be withdrawn to the budget, and in the second case, if costs are not reduced in parallel with prices, then part of the profit will be missed due to price reduction.

It is also necessary to sharply increase taxes on the income of a wealthy minority, on the one hand, and on the other hand, to reduce taxes for the middle class and apply "reverse income taxation" for low-income segments of the population. [148]It is also necessary to increase the scale of the budgetary redistribution of financial resources in favor of low-income population segments by increasing social programs.

17. The market economy and democracy have achieved unprecedented progress by putting the vices of human nature, such as the greed of entrepreneurs and the ambition of politicians, into the service of society. However, the foundations of a market economy were formed when there were no monopolies, and the foundations of a modern form of democracy were formed when there were no modern means of manipulating public consciousness. But by now, this system has already outlived its usefulness. Monopolies kill the very idea of a market economy and self-regulation, and the manipulation of public consciousness kills the existing form of democracy. They have reduced to the absurdity of a world in which billions of dollars are spent on armaments, financial speculation, and luxury. At the same time, millions of people suffer from poverty, disease, and nature is destroyed before our eyes every day. As a result of this madness, insane dictators like Hitler, Stalin, Putin, and others are democratically elected. It is hard to imagine that such madness can last long. Radical changes are needed, both in the economic and political systems.

18. Monopoly and competition are mutually exclusive. Monopolization is due to the growth of productive forces. It is inevitable and will continue. At the same time, the

[148] "The most immediate way to reestablish shared prosperity is through a "reverse income tax" that supplements the wages of the middle class. Instead of money being withheld from their paychecks to pay taxes to the government, money would be added to their paychecks by the government. A similar idea was proposed by the prizewinning economist Milton Friedman, and we now provide this for low-income workers through the Earned Income Tax Credit. The EITC has not only helped reduce poverty but has also increased the incomes of families most likely to spend that additional money, and thereby create more jobs. In 2009, the EITC was the nation's largest antipoverty program. Over 24 million households received wage supplements. Given what's happened to middleclass incomes, the EITC should be expanded and extended upward." (Reich, 2013, 142.)

government itself is the largest monopoly. But who will dominate in making decisions that regulate the economy - the government (in the interests of society) or private monopolies (in the interests of small groups of oligarchs)?

In a democratic system, a contradiction is born between economic and political forces. In monopolization, the minority gets richer, at the expense of the relative impoverishment of the majority. Because of polarization, economic power is concentrated in the hands of a small elite, while the electorate, that is, most of society, remains the source of political power, according to the constitutions of democratic countries. As long as the Government is under the effective control of the economic elite, Government protects their interests. But when the electorate realizes the actual problems, they will re-elect political power. The new Government will express the interests of the entire society. It will establish a meritocracy and be under the influence of the intellectual rather than the economic elite. Fundamental transformations will begin in all spheres of society, including the economic one. [149]

19. A competitive economy always strives for equilibrium, as its optimal state, but never reaches it. But a monopolized economy even never strives for it. On the contrary, it deviates more and more from the optimal state. The modern economy is in the funnel of an attractor, leading to a systemic crisis of capitalism. This movement can be slowed down but cannot be undone. Replacing the existing system with a fundamentally new one is only a matter of time. Today, scientists should think not about how to save the "atherosclerotic" system, but about what the new system should be like and how to make the restructuring process of the existing system into a new one less painful.

[149] Monopolies crowd out competition and self-regulation; large corporations separate the function of ownership from the function of management. This requires new economic relations. The economy of the era of robotization, nanotechnology, and digital economy is possible only under conditions of state ownership of the means of production and synthesis of centralization and decentralization of the economy. Therefore, as the largest monopoly, the state will gradually buy out all privately owned means of production. In conditions of enormous labor productivity, such an abundance of goods will be created, so material incentives will not be able to remain the economy's main engine. The labor market will be the only primary resource market that will remain until the complete automation of production. Wage labor will be more and more intensively pushed out of production. But not unemployment will increase, but the "creatosphere" (Buzgalin). In all spheres of social life, instead of hired labor, creative labor will prevail, which does not need external stimulation (its incentives are contained in itself), but only in creating the necessary conditions the state provides. Ultimately, only the market for consumer goods will remain, where prices will be formed based on supply and demand. These prices of consumer goods will serve as input information for the "fine tuning" of economic models in the "online mode" of the digital economy. And the Universal Basic Income will become the primary source of purchasing power for all members of society.

Appendix

Economy in terms of Sociocybernetics

1. Formation of social systems

1. Sociology has long and with great success using functional approach to analyze social systems. Analysis of the economy as a social system in the context of some ideas of "meta-theories", developed by Talcott Parsons and Niklas Luhmann will clarify many issues of economic theory. Many ideas of T. Parsons regarding the system of social actions, and N. Luhmann, regarding operational closeness and causal openness, autopoiesis and self-reference of social systems, etc., are of particular importance in this respect. As a result of such an analysis of a decentralized economic system as one subsystem of society, we will get a new interpretation of economic processes, economic categories and interrelations between them.

2. Any social system has its environment and, accordingly, a boundary that distinguishes the system from the environment and fixes the difference between them. If this distinction is erased, the system and its environment will disappear. The system and its environment cannot exist without each other. The formation of the system at the same time means the formation of its environment and, accordingly, its borders. (See, Luhmann, 2007, 43). But how is the system formed? Who draws its border? The system itself does this. The system distinguishes itself from everything else by its own operations.

> *"If an operation of a certain type has started and is, ... capable of connectivity - that is, if further operations of the same type ensue from it - a system develops. For, whenever an operation is connected to another, this happens selectively. Nothing else happens; the unmarked space or the environment remains outside. The system creates itself as a chain of operations. The difference between system and environment arises merely because an operation produces a subsequent operation of the same type." (Luhmann, 2013, 52.)*

According to the presented concept, the operation that "produces a subsequent operation of the same type" and thereby creates a social system is a social action. Economic action, as one form of manifestation of social action, is the only operation that forms the

economic space. It divides the unmarked social space into economic (internal) and the rest, non-economic (external). N. Luhmann writes: "the system always operates on the inside of the form - that is, in itself, and not on the outside. But this operation on the inside - that is, in the system as opposed to the environment - presupposes that there is in fact an outside, an environment. …a system cannot operate in its environment … its operations thus always take place within the system. If systems operations did actually take place in the environment, the distinction between system and environment would be undermined." (Luhmann, 2013, 64.)

3. The functioning of the economic system is the permanent reproduction of its difference from the environment and, consequently, the reproduction of its borders. This difference arises from the fact that, since an economic action can only arise from another economic action, then economic actions can only exist within a system of economic actions, and no action can go beyond that system.[150]

2. Social action

1. Each system can be divided into parts and smaller subsystems only until we reach its primary element. Further division of this unit *within the framework of this system* is impossible. With its further division, the system itself loses its emergent properties and, therefore, cannot be considered a system.

As already noted, the operation that creates a social system is a *social action*. In the economic subsystem of society, social action takes the form of *economic action*. Social action is constitutive and, within a given system, the indivisible element of that system. But, as an act of purposeful action in general, outside the context of a social system, social action itself is a teleological structure. [151] Its components are goal, means, results, and values.

2. T. Parsons was the first sociologist who recognized social action as the primary element of the social system. [152](See Parsons, 1949). The very term "social action" T. Parsons adopted from the sociological theory of Max Weber. M. Weber writes: "We shall speak of 'action' insofar as the acting individual attaches a subjective meaning to his behavior – be it overt or covert, omission or acquiescence. Action is 'social' insofar as its subjective meaning takes account of the behavior of others and is thereby oriented in its course." (Weber, 1978, 4.) ….. "Thus, money is a means of exchange which the actor accepts in payment because he orients his action to the expectation that a large but unknown number of individuals he is personally unacquainted with will be ready to accept it in

[150] "… that a system cannot use its own operations to get in touch with the environment. And this is precisely the point made by the thesis of operational closure. Operations are from beginning to end (or, in other words, if seen as events) always possible only inside a system, and they cannot be used to make an intervention in the environment. For, in that case, when a border is crossed, they would have to become something other than system operations." (Luhmann, 2013, 64.)

[151] Just as the cell is the elementary unit of a living organism, the cell itself is also a system. However, the element of the organism as a system is only the cell, not the components that make up the cell.

[152] Explicitly or implicitly, the category of "human action", including "social action", was at the center of the attention of many social thinkers M. Weber, T. Parsons, N. Luhmann, A. Schutz, J. Habermas, and others. Economist, philosopher, and sociologist L. Mises dedicated the fundamental treatise Human Action (1949) to this problem. But this category has not received the attention it deserves in the economic mainstream.

exchange on some future occasion. … . The economic activity of an individual is social only if it takes account of the behavior of someone else. Thus very generally it becomes social insofar as the actor assumes that others will respect his actual control over economic goods. Concretly it is social, for instance, if in relation to the actor's own consumption the future wants of others are taken into account and this becomes one consideration affecting the actor's own saving. Or, in another connexion, production may be oriented to the future wants of other people." (Ibid., 22)

Based on M. Weber's category of 'social action' T. Parsons could present society as a *system* of social actions. In turn, the systematic approach of T. Parsons to the analysis of society was enriched by his student N. Luhmann with the ideas of autopoiesis, operational closure and causal openness, positive and negative feedback, self-reference, and other ideas of constructivism and second-order cybernetics.[153] But, unlike T. Parsons, as the primary element of the social system, N. Luhmann presented not social action, but *communication*. Accordingly, for him, society was not a system of social actions but a system of communications. In the concept of a social system, Luhmann replaced the primary element, for he believed that "[o]nly with the help of the concept of communication can we think of a social system as an autopoietic system, which consists only of elements, namely communications, which produce and reproduce it through the network of precisely these elements, that is, through communication." (Luhmann, 1992, 71.). [154]

3. According to the concept we propose, as a primary element of a social system, as an autopoietic system, it is not only possible but even more adequate to represent *social action*. Like any human action in general, a social action is a teleological act. Although its external correlate may be an empirical process, this empirical process in itself is not action. "Every physical phenomenon must involve processes in time, which happen to particles which can be located in space. It is impossible to talk about physical processes in any other terms, at least so long as the conceptual scheme of the classical physics is employed. Similarly, it is impossible even to talk about action in terms that do not involve a means-end relationship

[153] Constructivism had a strong influence on sociology. The German scientist Niklas Luhmann (1927–1998) was one of the first who built a system of social philosophy on the fundamental ideas of constructivism, such as the theory of complex, self-organizing systems, autopoiesis, operational closure and causal openness, self-reference, structural coupling and contingency, etc. The works of N. Luhmann represent a sociological version of constructivism and are already mentioned as classical works, along with the works of E. Glasersfeld, H. von Foerster, H. Maturana, F. Varela, and other well-known constructivists.

[154] Interestingly, N. Luhmann himself hesitated for a long time when choosing the primary element of the social system. Still, in the end, out of two alternatives - social action and communication - he preferred the latter. In one of the interviews, Prof. R. Stichve recalls: "I think, in fact, that it was the transition to the theory of autopoiesis that outstripped the need for a solution to this issue. I remember when I was still a student, Luman - it was somewhere in the late 70s. - often repeated that he needed to resolve the issue of fundamentality, or the basic element in favor of action or communication, and he did not yet know what would be preferred. This went on for a couple of years." (Stichweh, 1999.) N. Luhmann himself wrote: "The most important piece of work on the concept of society remains to be done. It is posed by the question: which is the operation which produces the system of society … My proposal is that we make the concept of communication the basis and thereby switch sociological theory from the concept of action to the concept of system. This enables us to present the social system as an operatively closed system consisting only of its own operations, reproduced by communications from communications. With the concept of action external references can hardly be avoided. … Only with the help of the concept of communication can we think of a social system as an autopoietic system, which consists only of elements, namely communications, which produce and reproduce it through the network of precisely these elements, that is, through communication." (Luhmann, 1992, 71.).

with all the implications just discussed. This is the common conceptual framework in which all change and process in the action field is grasped. Thus the action frame of reference may be said to have what many, following Husserl, have called a "phenomenological" status. It involves no concrete data that can be "thought away", that are subject to change. It is not a phenomenon in the empirical sense. It is the indispensable logical framework in which we describe and think about the phenomena of action." (Parsons, 1949, 733.)

It is very important to distinguish between actions themselves and empirical processes. Ludwig Mises' point of view is interesting in this regard: "Economics is not about things and tangible material objects; it is about men, their meanings and actions. Goods, commodities, and wealth and all the other notions of conduct are not elements of nature; they are elements of human meaning and conduct. He who wants to deal with them must not look at the external world; he must search for them in the meaning of acting men." (Mises, 1996, 92.) Production is not somehow physical, material, and external; it is a spiritual and mental phenomenon. (Ibid, 141.)

Each action, by its result, provokes, arouses the need to react to it, to respond to it, in one way or another. For, the result of each action is a means for another action, and the product is a resource for another action. The product of each action generates a need, in relation to which it itself becomes a resource, i.e., it generates a need for another action in which this product will be consumed.[155] Moreover, if a product fails to transform into a resource, it will not be considered a product. The product is deliberately produced as a resource for future actions. Thus, each action in itself already implies the need for another action. And if it cannot find its continuation, then it will itself turn out to be invalid, fictitious. (See Leiashvily, 2012.)

4. Such a "quantum" approach to constructing a theory of society, in which elements of the system are represented not by subjects but by their actions, is fully justified. Naturally, this also applies to its subsystems. If we consider, for example, only the economic subsystem of society, all subjects of society, whether they are individuals, firms, households, organizations, etc. - all of them, in one form or another, participate in the economic process, perform one function or another in it. But none of these subjects is a purely economic subject, and to some extent each of them is involved in the functioning of other, non-economic subsystems. That is, to one degree or another, all subjects are multifunctional. Therefore, naturally, a unit or an indivisible element of the economic subsystem cannot be an integral subject that performs not only economic functions, but which is also an actor in other subsystems of society. The economic subsystem does not cover all the actions of specific subjects, be they individuals or collectives. An element of the economic subsystem can only be those actions of the subject that perform certain economic functions, that is, only *economic action*.[156] Therefore, being a subsystem of society, the economy is a system of economic actions and not a system consisting of subjects.

At the same time, if, from an analytical point of view, we consider *actors* of the economic system as a *purely economic subjects*, then they appear as a certain *system of*

[155] "the satisfaction of the first need (the action of satisfying, and the instrument of satisfaction which has been acquired) leads to new needs;…" (Marx, 1998, 48.)

[156] Not all social actions are economical, and not all economic actions are social. Hereafter, by economic action we mean only social economic action.

economic actions that performs certain economic functions.[157] This applies to all economic actors, whether individuals, firms, or households. And economic facts are the results of these actions.

5. Facts themselves are not economic facts. Everything depends on the subject's attitude to the facts. Subjects perceive the same objective facts differently. For example, objectively, there is no production or consumption as such. Objectively, there are only transformations of some objects into others according to the laws of nature. But whether a person calls it production or consumption depends on his attitude to this process. Accordingly, he himself will be called a producer or a consumer. It also depends on whether certain objects are products or resources for him and whether he will perceive them as the embodiment of costs or embodiments of utilities, etc., etc. It is the same with all other economic categories - they are relative and exist only in the human mind.

That is, to be a producer, consumer, product, resource, etc., these are not the inalienable real properties of objects or subjects, but the functions that they perform. It is impossible to produce a product without being a consumer of resources. Therefore, he is also a consumer. But he is not only a producer and consumer. He is also a seller and a buyer, an investor and a saver, a creditor and a debtor, and so on. And in the conditions of the division of labor, each of these functions can be performed only as one side in interaction with other economic subjects. Thus, in a market economy, he can be a producer only because someone else is a consumer; he may be a seller - because someone else is a buyer; creditor - because someone else is a debtor; etc. Here, a circular organization of interrelated functions is formed. These functions cannot exist without each other. They form a single whole, a closed structure. But these functions are performed by economic actions. (See Leiashvily, 2012, 2015)

3. Autopoiesis

1. There is an interaction between the system and its elements. The economy, as a system of economic actions, gives rise to economic actions in itself, and economic actions, together, create an economic system. The system and actions give birth to each other. When a system gives birth to the elements of which it consists, we are dealing with circular causality. Such a system is a substance that is the cause of itself and, as such, acquires independence. But the economic system's independence and autonomy, are limited because it is a subsystem of society as a more global system. Accordingly, other social subsystems (politics, law, culture, etc.), as well as Nature, represent the environment for the economy. Such a process of self-generation, which represents the basis of the autonomy of a complex system, is what constructivists call *autopoiesis*.

> *"According to Maturana's definition, autopoiesis means that a system can generate its own operations only by means of the network of its own operations. And the network of its own operations is generated, in turn, by these operations. …. On the one hand, we are*

[157] See: Talcott Parsons regarding personality as a set of social actions in *The Structure of Social Action* (1949).

dealing here with the thesis of operational closure. The system generates itself. Not only does it produce its own structures, ..., but it is also autonomous at the level of operations. It cannot import any operations from its environment. ... Such operational closure is merely another way of formulating the statement that an autopoietic system by means of the network of its own operations generates the operations that it needs in order to generate operations." (Luhmann, 2013, 77.)

2. But in what sense does a social system give rise to social action? After all, is the action carried out by a person? The system gives rise to social actions with the help of a person. It provokes a person to carry out social actions. [158] In the context of social reality, the above reasoning means the following: every social action is associated with another action, since the social action of some actor achieves its result when other actors recognize its result as a means or condition for their actions. Since the result of one action is a means or condition for other actions therefore, each action carries in itself the germ of a future action. And if it does not find its continuation, then as a social action, it will itself turn out to be fictitious. This applies not only to economic actions, but to all social actions in general. This is the mechanism that ensures the coherence of social actions. In addition, any social action gives rise not to any other action, but specifically to "its other" action, i.e., an action that performs conjugate function. Thus, this mechanism preserves the existing intra-system organization of social actions and, hence, the integrity and stability of the system.

The product of each action gives rise to real opportunities to meet new needs. It is precisely these new opportunities that excite new real needs, and transform potential needs into actual ones, based on which new goals are formed and new actions are performed. It is with the help of actual needs that the spiritual energy that underlies any purposeful action is generated. It turns out that each action results not only in the satisfaction of one or another need, but also in the birth of new needs together with the possibilities of their satisfaction. That is, as a result of each action, all the prerequisites for subsequent actions are generated. It is an endless process of self-generation of the system of social actions. [159]

[158] "In a certain sense, action is the expression of the intention or will of actors, and to this degree it is subsidiary. In Parsons's theory the situation is reversed. Parsons supposes that action happens once these preconditions have been fulfilled - that is, once means and ends can be distinguished, once there are collectively given values, and once there is an actor available to execute the action. The actor is only one moment in the realization of action. One might say that he occupies his place merely accidentally. For someone else could also execute this particular action - but some sort of readiness for action, some sort of concretization of an action potential, must occur in a society for action to happen. Thus, it is not action that is subordinated to the actor. Rather, the actor is subordinated to the action." (Luhmann, 2013, 9.) The man performs social actions to satisfy his needs and performs those actions of his own free will. But the needs themselves (the majority of them) in him are generated by society, as well as the means and conditions for their satisfaction, which society provides him, that is, the system of social actions itself. Therefore, a person is free in his decisions and actions, but not free in the formation of needs. His needs are imposed on him (as well as the possibilities for their satisfaction are provided to him) by the social and cultural environment in which he is born and formed as a person. But the epoch, ethnos, culture, society, and microsocial environment in which he is born do not depend on him. Although each individual, within a certain range, is given the opportunity to freely choose their roles, functions and scope of activity, depending on individual abilities and interests. But the range of alternatives itself does not depend on it. Ultimately, the separate individual and his activity depend on the system and not the system on the separate individual. The system is formed and depends only on the totality of the social actions of many individuals.

[159] "Autopoiesis is a notion that requires systemic closure. That means organizational, but not necessarily thermodynamic, closure. Autopoietic systems are thermodynamically open, but organizationally closed. Without

4. Neural network of economic actions

1. The result of each action is obtained through the interaction of *many* means and conditions. The result obtained is itself *one* of the means or conditions for realizing other goals and obtaining other results. Similarly, each economic subject and each branch, under the division of labor, specializes producing *one* type of commodity, but to do this they must consume *many* other types of commodities, *each* of which is also produced by other subjects because of the consumption of *many* other types of commodities. On the other hand, the produced commodity will also be used in the production of various other commodities. At the same time, in the production of each of them, it will be only *one* resource among many other resources needed for production. And since each subject produces for others and himself consumes what others have produced, a necessary link in their activity, along with production, becomes the exchange of commodities due to which the actions of all subjects are interconnected into a single system that has a network pattern. [160]

> *"Whenever we encounter living systems-organisms, parts of organisms, or communities of organisms-we can observe that their components are arranged in network fashion. Whenever we look at life, we look at networks. ... The first and most obvious property of any network is its nonlinearity- it goes in all directions. Thus, the relationships in a network pattern are nonlinear relationships. In particular, an influence, or message, may travel along a cyclical path, which may become a feedback loop. The concept of feedback is intimately connected with the network pattern." (Capra, 1996, 82.)*

An economic actions network, like a neural network, consists of many elements of the same type and is organized according to the principle of neural networks of living organisms or the brain.

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going into details I would like to mention that the concept of closure has recently become very popular in mathematics by calling upon a highly developed branch of it, namely, Recursive Function Theory. One of its concerns is with operations that iteratively operate on their outcomes, that is, they are operationally closed. Some of these results are directly associated with notions of self-organization, stable, unstable, multiple and dynamic equilibria, as well as other concepts ...." (Foerster, 2003, 281).

[160] The very principle of the division of labor, which underlies the market system, implies that each subject specializes in producing one product, and for this it consumes many other goods produced by other subjects. At the same time, the exchange of goods becomes a necessary link in the functioning of the economy. As a result of this organization of the economy, relations between subjects (as well as relations between actions) have a network pattern, reminiscent of the neural network of the brain or living organisms. "... more and more .... researchers began to use network terminology to explain the modern realities of social life. .... Whatever network is considered ... the central point always remains the structure of the network relations – the model of connections, represented in the form of patterns of interaction between social actors. ... Social network subjects can be both individual members of society and collective social associations, allowing researchers to consider a wide range of structures - from micro to macro level. ... The network structure includes not only social subjects and the connections between them, but also the resource flows that network members exchange with each other. ... Today, network theory, which is a complex, generalized system of views on social life and human experience, is one of the most influential trends in modern sociological thought. In our opinion, this is due to the fact that, firstly, the network theory allows one to go beyond traditional explanatory schemes, presenting the structure of interactions and its emergent properties as the main determinant of social behavior. Secondly, it makes it possible to study connections at all levels, from interpersonal relations to the world system, thereby presenting social reality as a network space and establishing an analytical connection between the daily activities of individuals and heterogeneous social changes." (Knyazeva, 2006. 82-88.)

2. In a neural network, each neuron is connected through its dendrites to the axons of other neurons, and through its axon to the dendrites of many other neurons. Because of this configuration of connections, each neuron is directly or indirectly connected to all other neurons. As a result, we have a closed system in which all neurons are interconnected.

According to a similar scheme, the economic actions of subjects are interconnected, as well as various branches of the economy. The market prices of produced and consumed goods are analogous to the *weight coefficients* of interneuronal connections. Such networks are nonlinear in nature. However, unlike a neural network consisting of the cells of a living organism, the network of economic actions is not a material object. Action is a process. Accordingly, the network of economic actions has a procedural character and exists as a network of interconnected processes. [161]

A concrete action is a single act or process existing in time. It appears once, performs its function, and disappears. Although actions cannot be stored over time, the types of relationships between certain actions are preserved as *relationships* between the functions they perform. Some actions disappear after they performing their functions, but new actions appear in their place that perform the same functions. Moreover, the functions of all actions are interconnected in a strictly defined sequence, closing in a circle. Schematically, this can be represented: production - exchange - consumption - production - exchange again, etc.

3. At the same time, the actions are interconnected by "weak ties". Therefore, the same related function can be performed by actions carried out by different subjects. That is, it does not matter who specifically performs the action, it is only important that it performs the required function. For example, it doesn't matter who buys the product being sold, or who sells this or that product, who produces or who consumes, etc. The only important thing is that all the commodities that are consumed will be produced in the necessary quantity and that all the commodities that are produced be consumed. Accordingly, it is important that all those commodities for which there is demand be supplied, and that for all commodities that are supplied, exist demand. And in case of discrepancy between them, in the order of self-regulation, forces arise that bring them into line.

In this process, actions give birth to actions, thereby forming a network that, standing out against the background of everything that is not an economic action, delimits itself from everything else, and creates its own border by doing so. "An important characteristic of living systems is that their autopoietic organization includes the creation of a boundary that specifies the domain of the network's operations and defines the system as a unit." (Capra, 1996, 98-99.) As has been shown, the economy is a system of economic actions with a network structure. The network of actions and the actions themselves give birth to each other in the mode of continuous functioning of the system. There is a self-production of the system.

4. Accordingly, the fractal character of actions gains great importance. Because each economic action potentially might take any specific form of economic action (production, consumption, purchase, sale, investment, etc.), this action takes the exact form imposed on it by the preceding action that generates it. Each action performs a certain function, which gives

[161] "In the development of systems thinking during the first half of the century, the process aspect was first emphasized by the Austrian biologist Ludwig von Bertalanffy in the late 1 930s and was further explored in cybernetics during the 1 940s. Once the cyberneticists had made feedback loops and other dynamic patterns a central subject of scientific investigation, …" (Capra, 1996, 42.)

rise to another action that performs some other function, but is conjugated with the function of the previous action. For example, under the conditions of the division of labor - production gives rise to supply, supply gives rise to demand, demand gives rise to purchase, purchase gives rise to consumption, consumption gives rise to production, etc. They are all actions and have the same teleological structure, and represent the unity of goal, means and result. All this is possible because each action has a fractal nature and can potentially perform any function that the action that generates it imposes on it.

5. Each action generates "its other" action and is itself generated by other actions. Because of this, they reproduce the structure of the system. The circular organization of functions, is reproduced by the very sequence of actions performed. For, the reproduction of this sequence of actions is conditioned by the very functions performed by each of these actions. The sequence of actions determines the reproduction of the circular organization of functions. And their circular organization determines the sequence of the actions themselves. This is because each action generates "its other" action, which performs precisely the function that is the necessary link for the reproduction of the circular organization of functions.

6. In a decentralized economy, the actions of subjects are interconnected by "weak" ties. Under conditions of competition, these connections between the actions of specific subjects constantly arise and disappear and are replaced by new ones because they have many alternatives. This allows actors, along with changing market conditions or other social or natural circumstances, to constantly find more profitable partners, break contracts and establish new connections, etc. Due to the presence of "weak links" between actions, implementing patterns of functional relationships can be carried out through a huge variety of alternative trajectories and chains of economic actions of various subjects, due to which *feedback loops* appear in the system.

"A feedback loop is a circular arrangement of causally connected elements, in which an initial cause propagates around the links of the loop, so that each element has an effect on the next, until the last "feeds back" the effect into the first element of the cycle …. The consequence of this arrangement is that the first link ("input") is affected by the last ("output"), which results in self-regulation of the entire system, as the initial effect is modified each time it travels around the cycle. (Capra, 1996, 56-57.) [162] The concept of self-organization arose from the awareness that the *network* is a pattern inherent in life as such; this concept was further developed by Humberto Maturana and Francisco Varela in their theory of autopoiesis. Society is also an autonomous system, and the social life and economic activity of the society have a network character.

[162] "Wiener and his colleagues also recognized feedback as the essential mechanism of homeostasis, the self-regulation that allows living organisms to maintain themselves in a state of dynamic balance. … Thus the concept of the feedback loop introduced by the cyberneticists led to new perceptions of the many self-regulatory processes characteristic of life. Today we understand that feedback loops are ubiquitous in the living world, because they are a special feature of the nonlinear network patterns that are characteristic of living systems. The cyberneticists distinguished between two kinds of feedback- self-balancing (or "negative") and self-reinforcing (or "positive") feedback." (Capra, 1996, 58-59.)

5. Operational closure and causal openness

1. N. Luhmann uses the concept of operational or functional closure to explain how order is born in social systems. Each subsystem can function normally only if all other subsystems also perform their functions normally. This means that all functions performed by various subsystems in society are interdependent and necessary for each other and for the system as a whole. This also applies to the economy. All its branches and each action perform certain functions that are necessary for other branches and other actions. They are functionally interconnected and constitute a functionally closed whole. "By "closure," I do not mean thermodynamic closure but only operational closure, which means the recursive enablement of a system's own operations through the outcomes of its own operations." (Luhmann, 2012, 51.)

2. Operational or functional closure implies that performing one function is a condition for performing another function. Thanks to this, self-reference and, accordingly, self-determination of the system takes place. That is, recursive operations appear in the system, which are the basis of the system's autonomy. At the same time, operational closure is not a deliberate result of the actions of any actor. Operational closure is self-reproducing because each economic action logically gives rise to "its other" action. And this chain of interconnected functions is transformed into a closed system in which all functions generate each other. [163] Unlike individual actions, which, having once arisen and having fulfilled their function, disappear forever, these functions themselves and their interconnections remain as long as the system itself exists. Thus, the continuity of the fulfillment of all interconnected functions is maintained because of one-time appearing and disappearing actions.

3. As a result of the circular organization of these functions, the sequence of actions performed is repeated indefinitely as long as these functions are performed and, hence, as long as the economic system exists. As noted above, the circular organization of functions gives rise to such a sequence of actions, due to which the functions performed by these actions have a circular organization and form a closed structure. But this just means that the functioning of the social system depends on itself. And dependence on oneself is autonomy (i.e., independence). Functional or operational closure is the basis of this autonomy.

4. Social actions correspond to certain causal processes in the empirical world. But social actions and causal processes exist in different dimensions. Social actions are perceived in the teleological frame of reference, and causal processes in the spatio-temporal frame of reference. (See, Parsons, 1949). From the empirical point of view, it makes no difference whether chance or the human mind and will have conditioned these causal processes; whether or not they correspond to human needs. In the real world, what happens is that one type of

[163] "You all know about the unprecedented successes of the recursive functions that are in constant use in chaos theory and indeed elsewhere. But I have the feeling that these results of chaos research can be applied by sociology only metaphorically.Why? All chaos research is concerned with functions, and functions are only relations between numbers, at best, complex numbers. … It operates only on numbers, but sociology doesn't work with numbers: sociology is interested in functions. And functions of functions one calls functors. A functor is, so to speak a system that is intended to coordinate one group of functions with another group, …" (Foerster, 2003, 306).

matter and energy is transformed into another. All these transformations obey the laws of nature. But whether they will be provoked by chance or human will - does not affect the course of the process itself.

5. Thanks to circular organization of interconnections, the system of economic actions depends only on itself and, as such, is an autonomous system. But the empirical processes through which these actions are realized do not represent any closed structure. These processes are included in the usual causal links with external reality and are subject to objective natural and social laws. Therefore, the empirical processes through which the economic system is implemented are causally interconnected with natural and social processes outside this system. In this sense, the economy is an *organizationally closed* but *causally open* system of economic actions. In other words, economic actions as teleological structures are connected only with each other, while the causal processes through which they are implemented are related to the external environment.

6. A man acts under the influence of his values and decisions. And being a living organism and, as such, a part of objective reality, it is included in causal interactions with other objects and purposefully causes changes in them under its needs. At the same time, he seeks, with the help of a system of values, to carry out such actions, and change reality so that the even-utility of costs is achieved, as a sign of the optimal satisfaction of all needs by the available opportunities.

7. Impulses received under the influence of causal processes from the external environment experience a specific continuation within the system of actions in accordance with the peculiarities of the structure of intra-system functional connections. In other words, the system begins to respond in a specific way to the influences of the external environment and, accordingly, it also begins to influence specifically its external environment by transforming "input" impulses into "output" impulses in a peculiar way.

8. The open system always remains only partially autonomous. That is, it depends on the external environment only in some aspects, but in other, it does not depend on it. "Numerous experiences indicate that very complex systems that are highly autonomous (if one may relativize this word) increase equally their independence and their specific dependencies. In modern society, the economic system, the legal system, and the political system possess a high degree of independence but also an equally high degree of dependence on their respective environments. If the economy is not booming, political difficulties ensue. And when politics is not able to provide certain securities - say, via the legal system - or if politics intervenes too massively, this becomes a problem in the economy. Returning to the thesis of operational closure, we cannot help but distinguish between causal in/ dependence, on the one hand, and self-generated operations, on the other." (Luhmann, 2013, 82-83.)

The system reacts only to certain external factors and is indifferent to other factors occurring in the external environment (if they do not destroy the system). Therefore, not all influences can be considered as "inputs", but only a small part of them. In this sense, the system is closed, because causal processes from the outside world do not penetrate it. It is open in the sense that it is not isolated from the external environment. It selectively reacts only to changes in the external environment that are important for the system. At the same time, it ignores all other external factors that do not have any significance for the system.

6. Self-reference

1. Operationally closed systems are self-referential systems that are studied by synergetics, constructivism and second-order cybernetics. Such systems have unique properties. Louis H. Kauffman classifies such systems as "reflexive domains". "'Reflexive' is a term that refers to having an object's connection to itself. A person can be aware of his own thoughts. The organism produces itself through its own action and its own production. The market or the financial system is made up of actions and people, and the actions of these people affect the market in the same way that global information from the market affects the actions of people. "'Reflexive' is a term that refers to the presence of a relationship between an entity and itself. One can be aware of one's own thoughts. An organism produces itself through its own action and its own productions. A market or a system of finance is composed of actions and individuals, and the actions of those individuals influence the market just as the global information from the market influences the actions of the individuals. Here it is the self-relations of the market through its own structure and the structure of its individuals that moves its evolution forward. Nowhere is there a way to cut an individual participant from the market effectively and make him into an objective observer. His action in the market is concomitant to his being reflexively linked with that market. It is just so for theorists of the market, for their theories, if communicated, become part of the action and decision-making of the market. Social systems partake of this same reflexivity, ….. The existence of fixed points for arbitrary transformations shows us that the domain we have postulated is indeed very wide. It is not an objectively existing domain. It is a clearing in which structures can arise and new structures can arise. A reflexive domain is not an already existing structure. To be what it claims to be, a reflexive domain must be a combination of an existing structure and an invitation to create new structures and new concepts. The new will become platforms from which further flights of creativity can be made. Thus in the course of examining the concept of reflexivity we will find that the essence of the matter is an opening into creativity." (Kauffman, 2009, 121.)

A good example of reflexive relations is the dependence of the cognition of economic reality on the results of cognition. Actor and reality change each other in the process of interaction. After all, the subject acquires knowledge about reality as a result of observations. The actions of the subject cannot be the same before and after acquiring new knowledge about the existing reality. Along with the change in knowledge, the nature of these actions also changes. It is also obvious that the results of observations, i.e., knowledge, cannot remain unchanged before and after the actions of the subject, because the observed reality changes as a result of his actions. [164]

[164] "…. social systems are quite different from physical systems. When theories of physical phenomena change, we assume that the phenomena themselves do not change. For example, when physicists changed their thinking from classical Newtonian mechanics to quantum mechanics, the behavior of atoms did not change. But when theories of social systems change, social systems operate differently. For example, the theories of Adam Smith, Karl Marx, John Maynard Keynes, and Milton Friedman did change the way social systems operated. Hence, in the social sciences there is a circularity or a dialogue between theories and phenomena. This circularity does not occur in the natural sciences, or at least not in the same way. Our use of technology affects the environment, which leads to new technologies, but theories in the natural sciences remain mostly

2. In operationally closed systems, recursive operations are carried out. Recursive operations mean that the result of each operation is the basis for performing the next operation. A recursively performed function turns to itself endlessly. They seem to blur the line between cause and effect.

"First of all, the idea of closed circular causality has the pleasant characteristic that the cause for an effect in the present can be found in the past if one cuts the circle at one spot, and that the cause lies in the future if one does the cutting at the diametrically opposed spot. Closed circular causality, thus, bridges the gap between effective and final cause, between motive and purpose. Secondly, by closing the causal chain one also appears to have gained the advantage of having gotten rid of a degree of uncertainty: no longer does one have to concern oneself with the starting conditions—as they are automatically supplied by the end conditions." (Foerster, 2003, 230).[165]

3. An interesting feature of such systems is that they have so-called "eigen-forms", "eigen-values", "eigen-behavior". The point is that in the processes of interaction of such a system with the external environment there is no one-to-one correspondence between "input" and "output". The reaction of such a system to the influence of the external environment depends not only on the nature of this impact but also on the state of the system itself, which, in turn, is conditioned by the previous state and previous impacts of the environment. And the output reaction affects its subsequent change. That is, "output" is not a direct reaction to "input". The "output" depends on the structure of the system, its current state and those recursive processes initiated by the previous "input". Such behavior of the system acquires the character of "eigen-behavior" and it is no longer a reaction to external influences in the truest sense of the word. According to the closure theorem, as H. Foerster writes: "The closure theorem: "In every operationally closed system there arise Eigen behaviors." (Foerster, 2003, 321).

4. A characteristic feature of recursive processes is that, when the system deviates from a certain state, they return the system to its previous state. An example from the field of economy is recursive pricing processes. Goods are produced by goods. Accordingly, the prices of goods produced are formed based on the prices of goods consumed. At the same time, for the production of final products, the consumption of primary resources is necessary, and for the reproduction of primary resources, the consumption of final products is necessary. Therefore, as was shown in the "Symmetric Model", the prices of final products depend on the prices of primary resources, and vice versa. In other words, pricing is a recursive process. Formally it can be expressed as follows: $p = F(p, v)$; $v = G(v, p)$; where: p – prices of final products; v - prices of primary resources.

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unchanged." (Umpleby, 2001, 2.) "Social sciences like economics differ from the hard sciences in that beliefs affect reality: beliefs about how atoms behave don't affect how atoms actually behave, but beliefs about how the economic system functions affect how it actually functions." (Stiglitz, 2012, 91)

[165] "To be sure, this is the case, but the matter is anything but simple: only certain values of those conditions provide a solution for the processes within the circle; the problem has become an "Eigen-value" problem. What also causes complication is that now the suspicion will be raised that the whole matter of circular causality might be mere logical mischief. We already know this from the theory of logical inference—the infamous vicious cycle: cause becomes effect and effect becomes cause. It is my intent not only to liberate the "*circulus vitiosus*" from its bad reputation,6 but to raise it to the honorable position of a "*circulus creativus*", a creative cycle. (Foerster, 2003, 230).

In “Understanding understanding” (2003), H. non Förster gives similar formulas x' = D(x, u), and u' = S(u, x), in which the variables (x, u) are represented as functions of themselves . You can also take into account the passage of time by entering the parameter “time” in the form of an increasing sequence of time units: t is the current period, t+1 is the next unit of time: $x_{t+1} = D(x_t , u)$, and $u_{t+1} = S(u_t, x)$. He further writes: “Those of you who are occupied with chaos theory and with recursive functions will recognize at once that these are the fundamental equations of recursive function theory. Those are the conceptual mechanisms with which chaos research is conducted; it is always the same equations over and over again. And they give rise to completely astonishing, unforeseen operational properties. Viewed historically, even early on one noticed a convergence to some stable values. An example: if you recursively take the square root of any random initial value (most calculators have a square root button), then you will very soon arrive at the stable value 1.0000. . . . No wonder, for the root of 1 is 1. The mathematicians at the turn of the century called these values the “Eigen values” of the corresponding functions. To the operation of taking roots belong the Eigen values 1 and also 0, since any root of 0 is 0. The essential difference between these two Eigen values is that for every deviation from 1, recursion leads the system back to 1, while at the least deviation from 0 the system leaves null and wanders to the stable Eigen value “one”.” (Foerster, 2003, 315-316.).

As in the above example, the actual prices “tend” to the equilibrium prices. More precisely, the equilibrium prices are “attractors” for the actual prices. Thanks to this, the entire economic system moves towards equilibrium, as towards its “eigen-state”. And although, because of the variability of the external environment, the economy cannot reach an equilibrium state and constantly deviates from the trajectory leading to it, but recursive processes constantly return the system to the previous trajectory.

5. Physicist, biologist, and cybernetician H. von Foerster scientifically described the processes occurring in a closed system, which are recursive and, with the help of which “eigen-values” appear. It turned out that in social behavior, as well as in biological processes and mental processes occurring in individual and collective consciousness, one can find something similar to “eigen-values” - a kind of analog of “fixed points” (“attractor points” or “attractors”) well known from mathematics and physics.

In his book “Understanding understanding” (2003) H. Foerster gives examples of recursiveness, with the help of which he tries to show what conclusions follow from the scientific concept, according to which the actions of the subject are recursive. He convincingly shows that “eigen-values” are formed by themselves exclusively as a result of recursive processes, exist only in the perception of subjects and intersubjective space. They do not exist in the real world.

> *“… Eigenvalues represent equilibria, and depending upon the chosen domain of the primary argument, these equilibria may be equilibrial values (‘Fixed Points’), functional equilibria, operational equilibria, structural equilibria, etc. … that Eigenvalues, because of their self-defining (or self-generating) nature imply topological ‘closure’ (‘circularity’) …” (Foerster, 2003, 265) “With this I have returned to the topology of closure where equilibrium is obtained when the Eigenbehaviors of one participant generate (recursively) those for the other ….” (Ibid., 267).*

6. The interaction of a man as a living organism, as one of the really existing objects with other objects, obeys the laws of nature, is based on *causal relationships*, and takes place in the real world. However, these objects (including the body of the person himself), and the interaction between them, are presented in the human consciousness as ideas, concepts, perceptions, and mental constructs. For, in consciousness there can be nothing but these ideal entities.

Consciousness cannot go beyond its limits and observe itself against the background of everything else. Therefore, it does not see the difference between itself and the external environment. But since the boundary cannot be seen if one does not cross it, the consciousness from within does not see its boundary, does not see where it ends and where something else begins. Therefore, consciousness is boundless for itself. Therefore, his ideas about individual objects and reality as a whole seem to him to be a direct reality, and not his subjective ideas about them, but not his own created model of reality, about which he does not and cannot have reliable knowledge.

The adequacy of his representations about individual phenomena of reality is subjectively assessed by the degree of consistency of these representations among temselves, between them and his complete picture of the world. The subject constantly coordinates his ideas, models, and values in the hermeneutic circle of transitions from the perception of parts to the meaning of the whole and clarifying the understanding of parts from the standpoint of the whole. Thus, in all processes of consciousness, it refers to itself. The self-referencing of consciousness is based on recursive processes.

Similarly, the self-reference of social consciousness occurs. But here, it takes on an intersubjective character and is realized through communications, which results in the formation of public ideas, norms and values. Here, the knowledge and representations of various subjects must confirm each other in the social space and serve as a sign of the reliability of the knowledge, ideas, values, and other mental entities that are dominant in society. Without this, the subjects could not coordinate their actions (including economic actions) and realize joint interests.

According to the above, certain empirical facts are not *economic* facts per se. All economic phenomena are such only due to the meanings and values that a person gives them in his consciousness. But outside of his consciousness, they are ordinary empirical phenomena that obey the universal laws of Nature (physical, chemical, biological, etc.). It follows from the preceding that what seems to us to be an economic reality in fact is only our cognitive representation and mental construct.

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