

7.3 Economic security in an innovative economy

Introduction. Today, humanity is entering an era of phase transition to a new socio-economic formation. This transition occurred during three industrial revolutions: Industries 3.0; 4.0; 5.0, the beginning of which was initiated by the EU. The key characteristics of this revolution are analyzed in scientific papers by Rifkin, 2013; Rifkin, 2015; Schwab, 2017; Schwab et al., 2018, Shahan, 2016; Rada, 2018. The production basis of the future formation, which is created in conditions of constant change, can be called an innovative economy.

Any transformational shifts bring a qualitative change in the socio-economic framework and significantly increase the risk of various risks: technological, social, and environmental. As a rule, all of them affect economic systems in one way or another, causing their purposeful or spontaneous transformation.

All this highlights the need to focus on the economic security of the functioning and development of social systems.

The concept of economic security. In the conditions of transformation processes, many reasons cause an increase in the probability of the specified risks. The main reasons are increasing the pace of economic processes, increasing toughness of production conditions, the dynamism of innovation, information vulnerability of economic systems, the unpredictability of evolutionary trajectories, growing environmental risks, increasing information load on people, complicating social management processes and others.

Economic security is the state of the economic system, which ensures the sustainable functioning of the economic entity (country, region, enterprise), meets the economic needs of participants, economic growth, protection of economic interests of the entity at the superficial level. An essential condition for ensuring the economic security of the economic entity is its ability to adequately (in the direction of action and speed of reaction) respond to challenges and threats of economic, social, environmental, and political nature.

As mentioned above, economic security issues are relevant in forming an innovative economy.

An innovative economy is an economic system based on the processes of constant generation and implementation of innovations and the creative transformation of production and consumption.

Economist Joseph Schumpeter introduced the concept of the innovation economy in his 1942 book *Capitalism, Socialism, and Democracy* (Schumpeter, 1943). Unlike the famous economist John Maynard Keynes, Schumpeter saw the source of economic growth not in the capital but innovation, in particular in evolving institutions, entrepreneurship, and technological change.

In our time, this theory has been further developed in the works by C. Freeman (Freeman, 2009), K. Antonelli (C. Antonelli) (Antonelli, 2003), D. Ahlstrom (D. Ahlstrom), 2010), and others.

Trialectic mechanism for ensuring economic security. We propose to analyze the phenomenon of economic security based on the trialectic concept of interaction of system-forming factors: material-energy, informational, synergetic presented by the authors.

Material and energy factors ensure the ability of the system to perform work by carrying out metabolic processes (metabolism, energy, and information) both inside the system and with the external environment.

Information factors determine the formation of information characteristics of the system, i.e., the algorithms of realization of energy potentials fixed by its memory, which provide the possibility of functioning and development of the system. The latter means the ability of the system to change (not change) in space and time for specific programs.

Synergetic factors determine the interaction of individual parts of the system with each other. They exhibit coordinated behavior and act as a whole, creating their system.

Figure 1 schematically shows the components of the formation of economic security based on the action of this trialectic mechanism, which is largely developed in the EU.

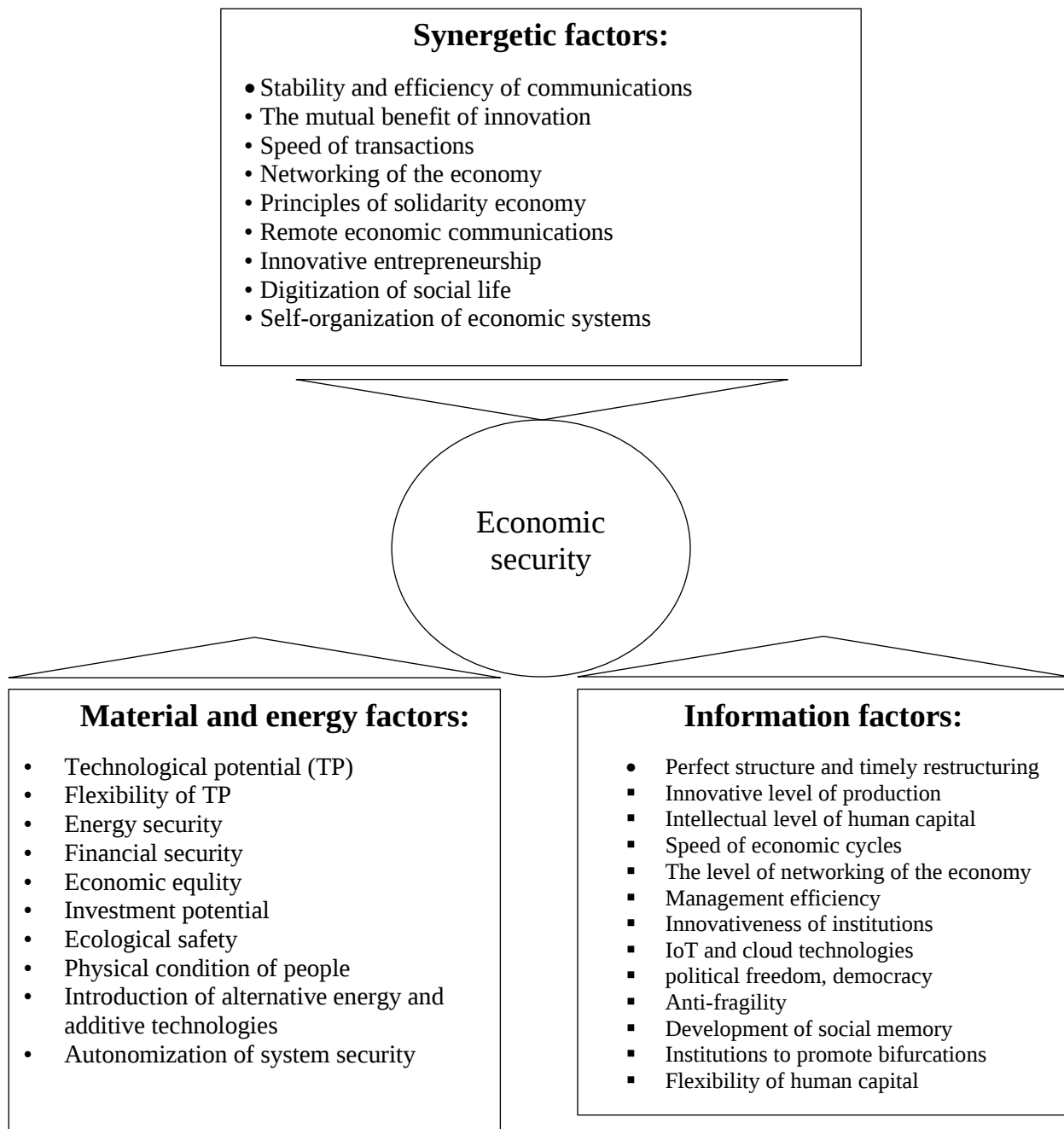


Fig. 1 Components of economic security

Components of the mechanism of economic security. Let's focus on detailing only the critical elements of this mechanism.

The primary purpose of material and energy factors is to ensure the power functions of the components of economic systems. It implies creating adequate energy potential (which means sufficient energy resources) and quasi-energy potential (i.e., sources of financing economic activities). This type of factor involves the creation of

a modern technological complex capable of solving the problems of the production and consumption of products in an innovative economy.

This potential must be able to, first, flexibly adapt (rebuild) to the current challenges of the present time; secondly, recover (preferably with improved quality characteristics) after possible adverse circumstances. In particular, Russian aggression has become such for Ukraine. Another crucial functional feature is the dynamism and prospects for developing the technological complex, which should include mechanisms for advanced modernization.

We can identify the following critical components of material and energy factors that create the preconditions for the formation of economic security in an innovative economy: compliance of technological potential with the tasks of forming a creative economy (quantitative and qualitative indicators); sufficient flexibility of technical potential and the ability to adapt to the challenges of time; provision of energy resources; sufficiency of quasi-energy (financial potential); provision of a sufficient inflow of financial flows into the economic system through economic activity; strong investment potential; the possibility of attracting external investors to strengthen economic potential; sustainable state of natural forces; healthy physical condition of human factors; high level of implementation of alternative energy and additive technologies; autonomy of security of separate links of system; the creation of protection systems for economic entities at the autonomous level.

The primary purpose of information factors is to ensure the high efficiency of the system and adequate operation of the feedback mechanism in it. The latter provides a high level (in quality and timeliness) of the adaptive activity of the system. The following key components of information factors can be identified, which play an essential role in the formation of mechanisms of economic security in an innovative economy:

- perfection of the structure of the economic system and its timely restructuring;
- compliance of the information level of production systems with the requirements of the time;

- sufficient intellectual level of human capital capable of ensuring the dynamics of the innovative economy;

- speed of implementation of innovation cycles (idea generation - idea selection - concept development - concept verification (testing) - economic analysis - product development - technology development - trial marketing - commercial implementation);

- level of networking of economic systems;
- effective management of the development of economic systems at different levels of management;
- compliance of institutions with the tasks of the innovative economy;
- the level of implementation of the Internet of Things and cloud technologies;
- susceptibility of economic systems to the introduction of innovations;
- providing anti-fragility properties;
- development of social memory systems;
- institutional support of bifurcation forms of economic development (in particular, built on a competitive basis for obtaining public resources);
- increasing the flexibility of human capital in the transition to new competencies.

The purpose of *synergetic factors* is to coordinate individual elements and their integration into a single holistic entity. The most relevant components of synergetic factors to ensure economic security in an innovative economy include:

- stability and efficiency of communications;
- interaction of separate elements in the formed integral systems of the creative economy;
- the speed of transactions;
- technological, economic, and social preconditions for networking of the economy;
- creating preconditions for the formation of the foundations of a solidarity economy;
- level of introduction of remote forms of production and consumption;

- level of innovative entrepreneurship and venture activity in business; digitalization of business and social life;
- increasing the level of self-organization of economic systems.

These components of the triune mechanism of interaction of system-forming factors form the basis of economic security in an innovative economy at different levels of its functioning.

Several vital drivers have a level of economic security in the country. Yes, economic security is weakly correlated with economic growth, but it is negatively affected by premature economic openness in foreign trade. The hasty opening of the economy and progress in globalization can lead to social instability and economic consequences that threaten any achieved economic level. Economic security is positively associated with political freedom, democracy, and the national index of happiness (ILO, 2004).

Among the essential principles of economic policy is the widespread support for redistribution to increase the economic security of income, mainly through the regulation of limiting upper gains. This idea is implemented in the study of unconditional basic income (UBI); regardless of social or employment status, the population is guaranteed by income. Adherence to this principle should cover all society groups: rich/poor, men/women, etc. (ILO, 2004).

Economic stability and a degree of predictability of opportunities allow planning and invest in their future. Economic security and economic stability encourage innovation, strengthen social ties and build trust in other population segments and institutions. Concerns about future mental health problems ranging from health to heart disease and increased risk of obesity are studied by Kong N., Osberg L. and Zhou W. (2019).

The pursuit of economic security is a powerful, universal sentiment common to most people in both developed and developing countries. It is due to poverty or low welfare and the growing gap between people's expectations and real situations. As this affects many people, a growing sense of economic insecurity can have severe consequences for economic policy (Jimenez M.A. and Roig M., 2021).

Conclusions. Currently, there is a phase transition to a new socio-economic formation, the production base of which can be conditionally called an innovative economy. Its main feature is the construction of constant generation and implementation of innovations. This transition was realized during the simultaneous three industrial revolutions: Industries 3.0, 4.0, 5.0, the beginning of which was initiated by the EU. In the conditions of transformation processes, economic security issues are significantly actualized. Prerequisites for economic security are created by interacting with three key factors: material and energy, information, and synergetic.

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