

Human capital at different stages of socio-economic development

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Abstract. The provided article represents an advancement of research focused on evaluating human capital concerning structural transformations within the economy. The primary aim of this study is to establish the link between the development of human capital and the structural shifts within the global economy. This is accomplished by integrating diverse multidisciplinary approaches for assessing human capital and forming a set of parameters to gauge the status of a nation's human capital within the framework of current and evolving world economic and technological structures. To fulfill this objective, the following tasks were addressed: identifying key classification features that delineate the characteristics of human capital development and utilization across various technological and global economic structures; constructing a comprehensive matrix of parameters that determine the condition of human capital within global economic and technological frameworks; and exploring how the processes of human capital formation are reflected in strategic plans for national economic development.

1 Introduction

According to strategic documents guiding the trajectory of national economic development, human capital is identified as a foundational element. Consequently, the socio-economic forecast for national economic growth until 2030 emphasizes the pivotal task of advancing human capital and elevating the population's living standards, impacting all sectors and levels of economic activity [1]. In the current stage of development, over 90% of the economic progress in advanced nations is attributed to contributions from scientific and technological advancements, primarily rooted in the expansion of intellectual and human capital. The robust reproduction of human capital serves as the cornerstone for sustaining the modern economic system's development. Nevertheless, as technological and global economic structures evolve, it's not just the quantitative evaluation of human capital that undergoes changes; its qualitative essence transforms, and the structure becomes more intricate [2]. This study delves into the processes of human capital formation and utilization within the context of shifts in global economic and technological structures [3]. This approach stems from recognizing that technological structures encompass an array of interconnected industries that compose a unified reproductive cycle of economic development. Each technological structure corresponds to specific forms of public

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consumption, production and social organization, a body of professional knowledge and skills, educational institutions, and management techniques. The transformation of technological structures triggers a substantial overhaul across all these elements of human and intellectual capital reproduction.

2 Research Methodology

According to strategic documents guiding the trajectory of national economic development, human capital is identified as a foundational element. Consequently, the socio-economic forecast for national economic growth until 2030 emphasizes the pivotal task of advancing human capital and elevating the population's living standards, impacting all sectors and levels of economic activity [5]. In the current stage of development, over 90% of the economic progress in advanced nations is attributed to contributions from scientific and technological advancements, primarily rooted in the expansion of intellectual and human capital. The robust reproduction of human capital serves as the cornerstone for sustaining the modern economic system's development. Nevertheless, as technological and global economic structures evolve, it's not just the quantitative evaluation of human capital that undergoes changes; its qualitative essence transforms, and the structure becomes more intricate [4]. This study delves into the processes of human capital formation and utilization within the context of shifts in global economic and technological structures. This approach stems from recognizing that technological structures encompass an array of interconnected industries that compose a unified reproductive cycle of economic development. Each technological structure corresponds to specific forms of public consumption, production and social organization, a body of professional knowledge and skills, educational institutions, and management techniques. The transformation of technological structures triggers a substantial overhaul across all these elements of human and intellectual capital reproduction.

3 Results and Discussions

While technological structures reflect the regeneration and progression of productive capabilities and the systems generating production and technology, global economic structures embody production relationships and the institutions shaping them. These economic structures possess a certain inertia, stemming from the power-economic dynamics and the motivation of the ruling elite to sustain their dominant status within society perpetually. Strikingly, social structures exhibit twice the inertia of production structures [6]. Technological structure changes materialize within the extended waves of Kondratiev spanning decades, whereas alterations in global economic structures manifest through Arrighi's century-long cycles of capital accumulation. These dynamics have profound repercussions on the fundamentals of human capital reproduction, governing the distribution of national income and wealth, shaping social hierarchies, and dictating the role of individuals in societal organization.

For instance, the shift from a colonial to an imperial world economic structure led to the emergence of social and legal states, the cessation of the slave trade and racial discrimination, eradication of illiteracy, and the establishment of a socially oriented economy [7]. This transition also witnessed a significant transformation in the allocation of investments, with a notable shift towards human capital, surpassing investments in physical capital such as machinery, equipment, and infrastructure. This transformation resulted in a dramatic overhaul of the entire framework for evaluating human capital (fig.1).



Fig. 1. Human Capital Management

In the 19th century, the assessment of human capital was primarily driven by the labor requirements of financial capital and was primarily expressed as the cost of reproducing labor in the form of wages within capitalist enterprises. In the 20th century, the focus shifted towards assessing human potential, which dictates the developmental potential of the entire national economy [4]. Furthermore, a substantial portion of the expenses required for human capital reproduction came under the purview of the state, encompassing free universal education, basic healthcare, pensions, and various social safety nets. The wage fund constituted just a fraction of the overall expenditure on human capital reproduction, and it witnessed significant expansion, accounting for approximately 70% of GDP distribution.

The utilization of the concepts of technological and global economic structures offers a comprehensive and systematic approach to the study of human capital's status and progression [5]. Currently, an all-encompassing global economic structure is emerging, poised to dictate the course of global economic development until the close of this century. This integrated global economic structure is overlaid onto the sixth technological structure, which shapes the technological core of this progression.

S.Yu. Glazyev posits that if our country can establish an effective system for managing economic development, Russia could potentially position itself at the "core" of the new global economic hub. This hub is taking shape in Southeast Asia, built upon the foundations of novel institutional structures and the creation of a fresh technological structure [6]. Contemporary development trends combine elements of strategic planning and market self-organization, as well as state oversight over financial, industrial, and social infrastructure, coupled with controlled private entrepreneurship aimed at enhancing public welfare. These trends also integrate nanotechnologies into the production sector and employ digital technologies in the social realm.

Amid the escalating turmoil in the heart of the waning imperial world economic order, rapid advancements in science and technology are unfolding in the burgeoning core of the integrated global economic structure. Notably, the World Intellectual Property Organization

reveals that the majority of patents in digital communications (57.4%) belong to Huawei Technology and LG Electronic Inc., while in computer technology, the patents are primarily held by IBM and Samsung Electronics. For electrical equipment and energy, State Grid Corporation of China, Toyota, Jidosha KK, Mitsubishi Electric Corp., and Robert Bosch GmbH dominate the patents.

Although the Russian Federation maintains relative technological supremacy in specific domains contributing to the formation of a new technological structure, such as measuring instrumentation, medical technology, food chemistry, engines and turbines, and civil engineering, the overall economy is regressing and becoming entrenched in the raw materials periphery of the imperial world economic structure [7]. The lack of equal economic exchange with its core deprives Russia of opportunities for independent development. To realize the goals of the nation's leadership for rapid economic growth, it is imperative to comprehend the human capital development patterns delineated in this article across various phases of the global and national economic evolution.

The initial mechanization of production organization during the era of the first technological structure relied on the specialized craftsmanship of artisans, often supplemented by the training of apprentices. This method of passing down qualifications and skills spanned generations. The second technological structure, driven by the mechanization of production through steam engines, necessitated the presence of engineers trained in educational institutions. Additionally, this era saw the employment of a significant workforce engaged in labor-intensive tasks, such as coal mining, railway construction, metallurgical processes, and the maintenance of steam engines.

Electrification of the economy during the third technological structure created a demand for skilled workers and specialists responsible for servicing conveyors, machine tools, and instruments. This shift prompted a shift toward universal primary education, as reading instructions became essential. Furthermore, mass secondary specialized education emerged to prepare professionals for equipment maintenance [8].

The fourth technological structure was characterized by the mass production of complex, durable consumer goods and multi-stage, knowledge-intensive technological processes. This necessitated specialists with higher education, and secondary education became universal.

The fifth technological structure witnessed the widespread implementation of automated control systems and rapid growth in knowledge-intensive industries. Operating and advancing such industries demanded professionals with higher education and, for research and development, professional scientists.

In the sixth technological structure, a transition to a knowledge economy occurred. Routine management processes became automated, work took on a creative dimension, and education aimed to provide not just knowledge but also the ability to engage in intellectual activities [11].

The long-term development pattern of the modern economy, as depicted, indicates that the life cycles of two technological structures align with the life cycle of one world economic structure. This alignment is likely influenced by the institutional aspects of human capital reproduction.

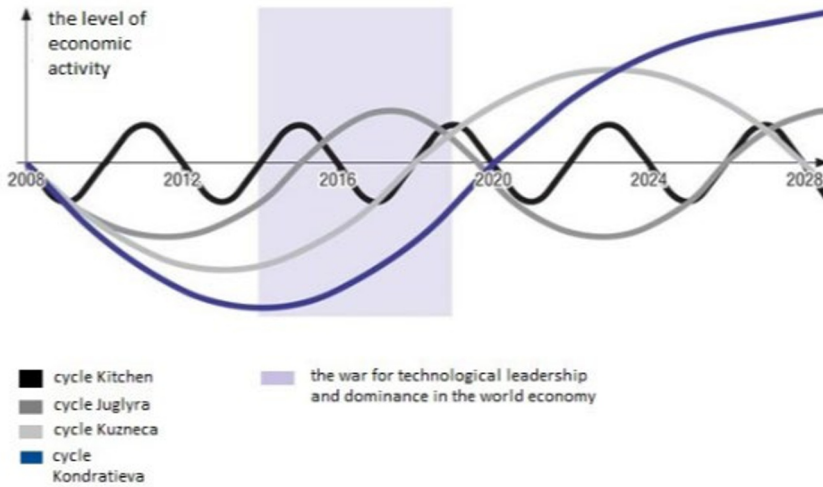


Fig. 2. The global economic crisis as a combination of cyclical processes.

The decline of the imperial world economic order, marked by vast vertically integrated transnational management systems, coincided with the emergence of the modern welfare state. During this period, the state's role shifted, and its share in the distribution of GDP grew from 10% at the beginning of the century to 50% at the end [10]. The state now aimed to enhance the well-being of the people. This era saw substantial improvements in the population's quality of life, political equalization, social guarantees, and labor rights.

Measurement of human capital during the imperial world economic order, whether in its socialist incarnation centered around the USSR or its capitalist version with the USA at its core, focused on elevating education levels and extending life expectancy. Other factors included assessing the population's health and consumption patterns. The introduction of a human development index, a standardized set of indicators applicable to all countries, considered factors such as life expectancy, literacy rates, expected duration of education, and the standard of living measured by gross national income (GNI) per capita at purchasing power parity (PPP) in US dollars [8].

This heightened focus on human potential represented a shift in public administration systems, a far cry from the colonial world economic system when state objectives concentrated on safeguarding property rights for the ruling elite. During the colonial era, the state acted as a "night watchman," primarily concerned with protecting the elite's interests against potential challenges from the working class. Population growth was not restricted, mainly due to agricultural overpopulation and labor migration to cities, and the requirements for labor were relatively low. Thus, the public administration of the time did not prioritize enhancing public welfare and largely concentrated on expanding resources and labor through colonial exploitation, using slaves and national labor forces. As a result, human potential indicators were scarcely employed. State-level measures of human capital were confined to population quantity and the rate of growth, both natural and artificial, driven by the acquisition of new colonies. Enterprise-level measurements were limited to the headcount of hired workers within the metropolis and the number of slaves in the colonies [9].

4 Conclusions

New five-year plans places significant attention on the development of an innovation path that primarily relies on the human factor. The country's new five-year plan places

significant emphasis on transitioning to an innovative development path that primarily relies on the human factor. The new shift will require substantial developments in key sectors such as science, education and healthcare, the social sphere. This is due to the need for greater improvements in key sectors such as science, education, health care and other facets of the social life. Among other things, it also underscores the importance of implementing motivation systems that allow individuals to completely realize their creative potential.

According to the context of economic modernization, maintaining labor market stabilization and improving state employment policy are important concerns. In the current stage, striking a balance of maximizing job prospects and mitigating the existing labor surplus is important.

We begin with the fundamental principle that every individual, regardless of their location should have the chance to work, make money, and pursue their life aspirations. We must work towards increasing the mobility of the labor force within the domestic job market, and create conditions for facilitating this mobility.

We need to responsiveness to the new demands of economic development and the workforce quality expectations from companies.

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