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Economic Assessment of the Quality of Human Capital

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ABSTRACT

Economic assessment of the quality of human capital is not only relevant, but also critically important for the effective management of socio-economic development at the global and national levels. Human capital is the main economic resource of the 21st century, increasing the country's GDP, which has become the main productive and social factor in the development of the economy of the Republic of Kazakhstan. The purpose of the study is to conduct an economic assessment of the quality of human capital in order to identify its impact on various aspects of socio-economic development, as well as to develop policies and strategies aimed at sustainable and balanced socio-economic development. The research hypothesis assumes that an economic assessment of the quality of human capital, with a focus on investment in fixed capital in various areas of use, will identify important patterns and the impact of human capital on various aspects of economic activity, as well as the creation of strategic recommendations for the optimal use of fixed capital in various areas. Effective investments in human capital have a significant impact on the use of fixed capital, promoting sustainable economic growth, innovation and increased competitiveness: a) it has been determined that a high level of human capital, including competencies in the field of new technologies and innovations, stimulates the successful implementation of modern technologies in production and service processes; b) found that companies that actively invest in developing the digital skills of their staff are more successful in adapting to changes in the technological environment. The study highlights the importance of an integrated approach to human capital management. economic assessment of the quality of human capital with an emphasis on investment in fixed capital in various areas of use emphasizes the need for an integrated and balanced approach

to managing human resources to achieve sustainable economic growth and competitiveness.

INTRODUCTION

An important area of effective management of human capital as the basis for the development of the national economy is the tasks of qualitative growth of human capital, which act as the driving force of modernization processes. For this purpose, education programs are being developed and updated, the task of which is to train specialists based on advanced knowledge and practices. In addition, attention is paid to the development of the scientific sphere as a transfer of new technologies to all significant areas and sectors (Wielechowski et al., 2021).

The new quality of the country's development, associated not with a commodity-based economy and the era of "oil abundance", but based on breakthrough technologies, a competitive market economy, effective management, and a high-quality banking system, is determined by the quality of human resources living and working in Kazakhstan (Awais Bhatti & Alnehabi, 2023; Navickas et al., 2023; Grabara et al. 2019).

In a global context, the competitiveness of a country's human resources becomes a more significant factor than its availability of raw materials. The competitiveness of human resources determines the competitiveness of a state at the present stage (Khalilov & Yi, 2021; Nurekenova et al. 2022).

In today's dynamic world, where economic and social transformations are constantly changing the picture of global development, issues of the quality of human capital and its impact on economic processes are becoming the subject of increasingly careful analysis and research. One of the key aspects in the analysis of human capital is its economic assessment, which becomes especially important when taking into account investments in fixed capital and their areas of use.

Investments in human capital, including education, health, professional development and innovative practices, form the basis for creating a highly skilled and adaptive workforce. In this context, scientific research based on the economic assessment of the quality of human capital with an emphasis on investment in fixed capital is intended to reveal the influence of these factors on various aspects of economic development.

The study of the quality of human capital, taking into account the directions of investment in fixed capital, is aimed at identifying those mechanisms that ensure the optimal use of human potential to achieve sustainable and innovative economic growth. In this context, this work seeks to present the results of an economic assessment of the quality of human capital, where special emphasis is placed on the consideration of investments in fixed capital in various areas of use. Through the prism of the research, the author will examine the relationship between investments in human capital and its impact on the effective use of fixed capital, as well as identifying key factors contributing to sustainable development and economic growth in the context of modern challenges and changes.

1. LITERATURE REVIEW

The economic valuation of human capital is a complex and multifaceted process because human capital includes a wide range of skills, knowledge, experience and health.

Issues of defining and structuring human capital, as well as analysis of related categories such as "human potential" and "capital" are considered in the works of various authors.

Over the past 30 years, strategic human resource management (hereinafter referred to as HRM) has clearly structured itself, developed its terminology and reached a mature stage in the field of knowledge, which has a significant impact on research in the field of HRM and related management disciplines. M. Kasa et al. (2020) which highlights the importance of education in promoting competent skilled human capital.

According to J. Deng, J. & R. Long (2017), personnel are a strategic resource that contributes significantly to the long-term development of an organization. According to this concept, people are the most valuable asset in a company and therefore saving on personnel costs is not practical. The growing importance of human capital to the ability of firms to generate profits, coupled with insufficient disclosure of information related to employees and investments in the workforce, creates an information gap. Given this limited disclosure, investors face information challenges when attempting to recognize differences in firms' ability to effectively invest in intangible assets in general and generate human capital in particular.

If an employee is committed to achieving company goals, demonstrates initiative, and achieves good results, the company may invest more in him. In the long term, these investments are returned to the company (Brita & Do Taran Feng, 2022).

Strategic human resource management is not a new concept, but an area that has evolved to provide an important and informative perspective on the role of HRM. People development and training represent a key strategic function of human resource management, aimed at developing a highly skilled workforce in light of current and future internal and external changes. The development of professional skills and personal qualities of personnel is considered one of the most important conditions for increasing and maintaining competitiveness, contributing to the expansion of the skills and abilities of employees required in the external labor market (Jakubowska et al., 2021; Sakytė-Statnickė et al., 2023).

Personnel development and training is the most important strategic function of human resource management, which is aimed at creating a high level of human capital potential in the light of existing and future internal and external changes. The structure and organization of human capital will change dramatically, which will inevitably lead to changes in the methods of human capital management. Therefore, organizations will need to rethink the way they recruit, attract and develop talent, rewards, etc. approaches to human capital management (Figure 1).

Figure 1. Approaches to human capital management

Source: compiled by authors according to Official resource of Industry qualification framework

Human capital is an integral part of an organization's "intellectual capital", which represents the difference between the market value and the book value of the company. The competitiveness of human capital is a priority for the state and is aimed at the quality of education and the formation of a system of institutions that create competitive conditions.

Managing and assessing the quality of human capital should be the focus of company management, as Gadzhiev et al mentioned (2019). In addition, the quality of human capital influences the sustainable economic growth of a country, as noted by O. Stryzhak (2019).

Many scholars also focus on the competencies, skills and abilities of the workforce in the context of Industry 4.0 and the social responsibility of companies in training the younger generation (Scavarda et al., 2019; Kovacs, 2021).

Human resource management, including personnel development and training, is an important strategic function necessary to increase the company's competitiveness and increase the skills of personnel in the external labor market, as noted in the works of Z. Whysall et al. (2019).

In economic theory, three main approaches to solving the problem of measuring human capital have been identified:

A) Indicative, based on the natural characteristics of human capital, which includes the following indicators:

- level of literacy of the population;
- average number of years of education per person;
- share of employees with different levels of education;

B) Point assessments of the quality of students' knowledge according to the results of international tests.

C) Cost based on taking into account the growth of an individual's income with the growth of human capital.

Ultimately, human capital is determined by a person's physical health and the share of world, national, corporate cultural capital acquired by a person in the process of socialization, training, work, and advanced training.

In world practice, various indicators are used to assess the development of human capital, the most significant of which is the Human Development Index (HDI) or the Human Development Index (HDI). When determining the success of a country in the development of human capital, over 50 indicators are taken into account.

Assessing the level of human capital development and sustainable economic growth is a typical multi-criteria decision making (MCDM) problem. Thus, it is necessary to identify competing criteria that should be included in the framework for assessing human capital and sustainable economic growth (Lulewicz-Sas et al., 2022; Savanevicienė et al., 2022).

The GDANP method is a comprehensive MCDM method based on Gray Relational Analysis (GRA), DEMATEL, Analytic Network Process (ANP) and Analytic Hierarchy Process (AHP). However, these methods have disadvantages that can be addressed by GDANP; for example, AHP and ANP cannot handle negative values (Mubarik et al., 2021). In addition, GDANP is successfully used in the selection of suppliers (Kumar & Anbanandam, 2020), bi-industry interaction, and assessment of regional intellectual capital (Liu et al., 2021). Thus, using GDANP to study the relationship between human capital and economic growth is a right step towards innovation in research methods.

Modern research in the field of economics shows that the human factor is the driving force behind the economic development of an organization or state. There is also a conflict of interests of various scientific fields around the concept of human capital. Despite the high degree of study, as well as the formulated theoretical ideas, it can be argued that the theory of human capital is being updated and becoming one of the most important economic categories (Turgel & Fazylzhan, 2023).

Some scholars suggest that there are two types of review studies on HRM:

- classic descriptive, narrative, unsystematized review;
- a systematic review with or without in-depth data analysis (Raitskaya & Tikhonova, 2020).

Economic theory presents human capital as a leading role in the process of economic and social development of countries. Indeed, human capital is presented in a number of research papers as a factor contributing to accelerated growth and sustainable development. Microeconomic analysis also shows that investments that increase human capital levels improve income distribution as well as reduce poverty (Sultana, 2022).

Based on modern research in the field of economics, we can conclude that the human factor plays a decisive role in the economic development of the state. This finding underscores the importance of human capital, education, workforce, and professionalism in shaping successful economic policies.

Research shows that the quality and education of the workforce directly affects the productivity and innovation potential of an economy. States that invest in education, while caring for the health and social protection of their citizens, tend to achieve more stable and sustainable economic growth. At the same time, public administration mechanisms, the development of effective economic policies and support for entrepreneurship are also important. All these aspects are closely related to the human factor, since the successful implementation of these policies requires competent and motivated people.

Thus, the human factor is not only the driving force of economic development, but also determines its sustainability and prospects. Modern development strategies of states are paying increasing attention to the development of human capital, which emphasizes its key role in achieving a sustainable and successful economic future.

2. ANALYSIS AND METHODOLOGY

Activation factors and growth patterns of human capital are key aspects in understanding how a society can improve its human capital, i.e. knowledge, skills, experience and health of its citizens. Here are some activation factors and human capital growth models:

A. Education:

- accessibility and quality of education - providing affordable and quality education is a critical factor. This includes wide access to educational resources as well as effective teaching methods;
- Lifelong learning (continuing education) - As technology and the economy advance, it is important to support continuing education systems so that people can update their skills throughout their lives.

B. Health:

- healthcare - access to quality medical services and disease prevention contributes to the creation of a healthy and productive workforce;
- healthy lifestyle - promoting a healthy lifestyle and physical activity is also an important aspect of supporting human capital.

C. Work and employment:

- labor market support - effective labor markets, including job creation and stimulating entrepreneurship, contribute to the growth of human capital;
- employment policies - promoting policies that promote job creation and fair employment can improve overall levels of employment and skills.

D. Innovation and technology:

- innovations in education - the use of modern technologies and methods in education can significantly increase the effectiveness of learning;
- investment in research and development - the development of new technologies and innovations can improve productivity and create new opportunities for human capital growth.

E. Social factors:

- equality and inclusion - equality in access to education and opportunity is a key factor for the growth of human capital;

- social protection - ensuring social protection and fair working conditions also plays an important role in creating a favorable environment for the growth of human capital.

Human capital growth models build on these factors, aiming to create a sustainable society with educated, healthy and skilled citizens. The interaction of these elements can help improve productivity, innovation and the overall standard of living in society. Scientists from foreign research groups argue that in a new economy based on knowledge, information, ideas and innovation, investment in human capital is a key indicator (Figure 2).

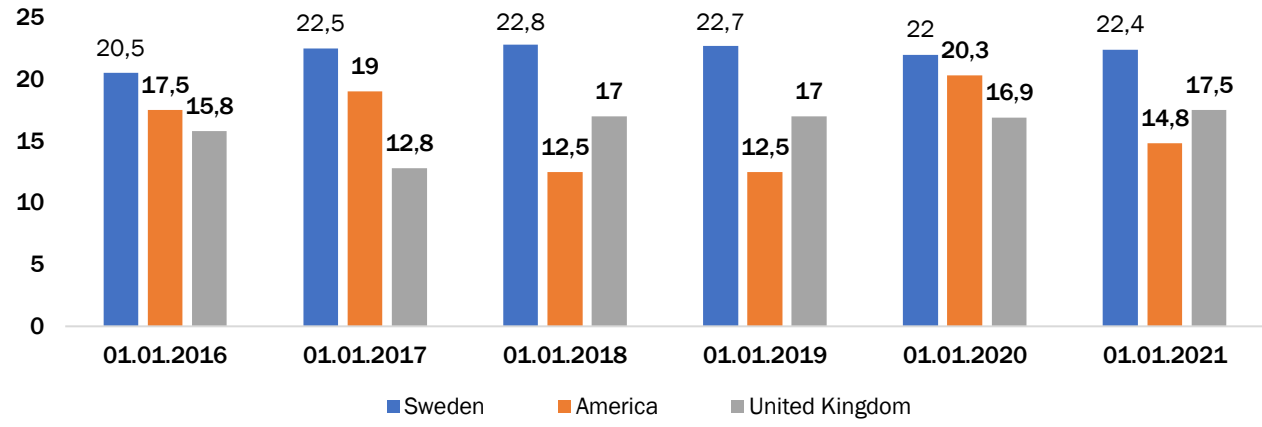

Figure 2. Controlling in the personnel management system contributes to the development of investments in human capital in the world, % of GDP

Source: Compiled by the authors according to Boikivska et al., https://doi.org/10.22937/IJCSNS.2022.22.2.35.

They also indicate that the introduction of controlling into the personnel management system contributes to the development of human resources, since this can lead to the competent use of professionalism and competencies of personnel in accordance with the goals and strategies of the enterprise, which in turn, in an innovative market economy, where there is uncertainty and the possibility of risk situations, which can help strengthen the organization's competitiveness in the market.

The Human Development Index is a comprehensive indicator of the standard of living of a person in a particular country, so it is sometimes used as a synonym for such concepts as "quality of life" or "standard of living." The index measures a country's achievements in terms of health, education and actual income of its citizens, in three main areas for which their indices are assessed:

- Life expectancy index: health and longevity measured by average life expectancy at birth.
- Education index: access to education measured by the average expected years of schooling for school-age children and the average years of schooling for adults.
- Gross National Income Index: a decent standard of living measured by gross national income (GNI) per capita in US dollars at purchasing power parity (PPP).

In 2010, the family of indicators that measure the HDI was expanded, and the Index itself underwent significant adjustments. In addition to the existing HDI, which is a composite indicator based on average country statistics and does not take into account internal inequality, three new indicators were introduced:

- Human Development Index adjusted for socio-economic inequality (HDI);
- Gender Inequality Index (GII);
- Multidimensional Poverty Index (MPI) (Table 1).

Table 1. HDI by country

Country	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*	*2020*	*2021*
HDI in CIS countries										
Kazakhstan	0,754	0,757	0,788	0,794	0,797	0,800	0,817	0,825	0,811	0,811
Russia	0,788	0,778	0,798	0,804	0,815	0,816	0,824	0,824	0,822	0,822
Ukraine	0,740	0,734	0,747	0,743	0,746	0,751	0,750	0,779	0,775	0,773
Turkmenistan	0,698	0,698	0,688	0,691	0,705	0,706	0,710	0,715	0,745	0,745
Azerbaijan	0,734	0,747	0,751	0,759	0,757	0,757	0,754	0,756	0,745	0,745
Armenia	0,729	0,730	0,733	0,743	0,749	0,755	0,760	0,776	0,757	0,759
Belarus	0,793	0,0,786	0,798	0,796	0,805	0,808	0,817	0,823	0,806	0,808
Georgia	0,745	0,744	0,754	0,769	0,776	0,780	0,786	0,812	0,802	0,802
Kyrgyzstan	0,622	0,628	0,655	0,665	0,669	0,697	0,700	0,711	0,750	0,767
Moldova	0,660	0,663	0,693	0,699	0,697	0,700	0,711	0,750	0,767	0,767
Tajikistan	0,622	0,607	0,624	0,627	0,647	0,650	0,656	0,668	0,685	0,685
Uzbekistan	0,654	0,661	0,675	0,701	0,703	0,710	0,710	0,720	0,721	0,727
Far abroad countries										
USA	0,937	0,914	0,915	0,920	0,922	0,924	0,920	0,926	0,927	0,921
Germany	0,912	0,890	0,891	0,926	0,934	0,936	0,939	0,947	0,942	0,942
Switzerland	0,875	0,892	0,907	0,939	0,943	0,944	0,96	0,955	0,945	0,962
Japan	0,699	0,719	0,727	0,903	0,907	0,909	0,915	0,919	0,896	0,925
Korea	0,920	0,911	0,916	0,901	0,900	0,903	0,906	0,916	0,925	0,925
France	0,909	0,891	0,898	0,909	0,920	0,922	0,920	0,932	0,929	0,929
China	0,893	0,884	0,888	0,917	0,748	0,752	0,758	0,761	0,604	0,952

Source: compiled by authors according to https://stat.gov.kz/

In the final ranking, all states are ranked based on the HDI and classified into four categories in accordance with the accepted gradation:

- countries with a very high HDI level (more than 0.9);
- countries with a high level of HDI (from 0.8 to 0.9);
- countries with an average HDI level (from 0.5 to 0.8);
- countries with a low HDI level (less than 0.5) (Table 2).

Table 2. Rating of countries of the world according to the Human Development Index

№	*Country*	*HDI*	*№*	*Country*	*HDI*
2020			2021		
1		0,957	1	Switzerland	0.962
2	Ireland	0,955	2	Norway	0.961
3	Switzerland	0,955	3	Iceland	0.959
4	Hong Kong	0,949	4	Hong Kong	0.952
5	Iceland	0,949	5	Australia	0.951
6	Germany	0,947	6	Denmark	0.948
7	Sweden	0,945	7	Sweden	0.947
8	Australia	0,944	8	Ireland	0.945
9	Netherlands	0,944	9	Germany	0.942
10	Denmark	0,940	10	Netherlands	0.941
51	Kazakhstan	0,825	56	Kazakhstan	0,811

Source: compiled by authors according to https://gtmarket.ru/

According to Table 1, many countries, including Kazakhstan, are seeking to increase their HDI by improving the quality of education, providing access to healthcare and supporting economic growth. If we consider the overall dynamics of the development of the HDI of the Republic of Kazakhstan, the trend has a positive dynamics, however, compared to 2020, in 2021 the HDI worsened its position (Figure 3).

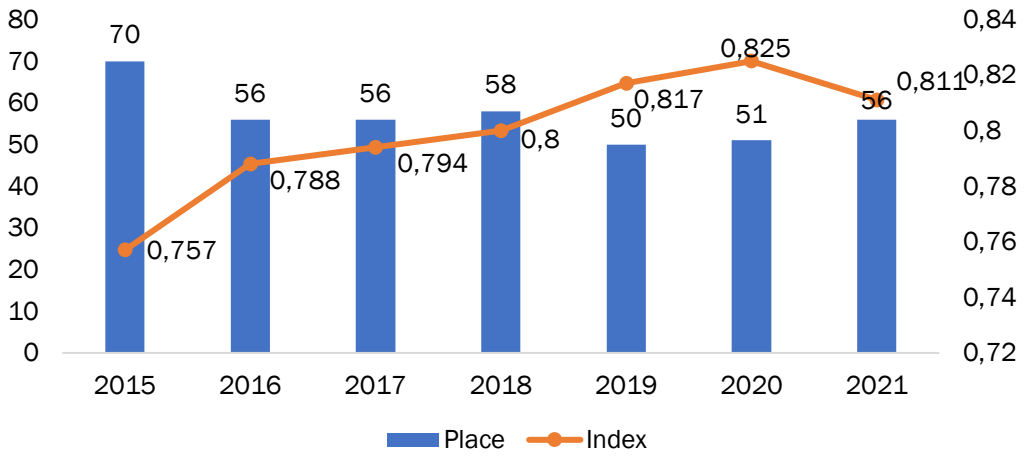

Figure 3. Dynamics of development of the Human Development Index of the Republic of Kazakhstan

Source: compiled by authors according to https://gtmarket.ru/

Investments in fixed capital, such as buildings, equipment and technology, can have a significant impact on the economic assessment of the quality of human capital in various areas of use. Here are several aspects of the impact of investment in fixed assets on the assessment of human capital:

- Technological progress and education - investment in new technologies and workforce education can improve the knowledge and skills of workers. This can help increase productivity and improve the quality of human capital.
- Working conditions and health - investments in modern and safe working conditions, medical equipment and programs to improve the health of workers can improve their physical and psychological well-being, which affects the overall quality of human capital.
- Development of skills and professionalism - investing in training and development programs for employees can improve their skills, which affects the quality of their human capital.
- Fostering entrepreneurship - Investments in the entrepreneurial environment, such as innovation hubs and financial support for start-ups, can help develop entrepreneurial skills and improve the quality of human capital in business.
- Employment and income growth - Investment in industries that create jobs and increase income can have a positive impact on the quality of life and overall well-being of the population.

Thus, efficient investment in fixed assets can improve many aspects of human capital, contributing to sustainable and productive economic development.

The relationship between human capital and investment in fixed assets has a significant impact on various aspects of the economy, shaping key areas of resource use. Let's consider the main directions and their relationships:

- Investments in education directly affect the formation of human capital. Funds invested in modern educational programs, advanced training and accessibility to education help improve the skills and competencies of workers. A trained and educated workforce becomes more productive and adaptable to changes in capital assets, such as the introduction of new technologies and equipment.
- Investments in health directly impact the health of human capital. Improving the health of workers reduces the number of medical absences and increases overall productivity and work efficiency. This creates conditions for more efficient use of fixed capital in production processes.
- Investments in the development of innovative technologies and digital solutions require a high level of knowledge and competencies among employees. Supporting education and training is

becoming a key factor for the successful implementation of innovations in fixed assets, such as automated systems, artificial intelligence and digital platforms.

- Investments in human capital management systems, including leadership training and motivation, help improve labor relations and increase staff motivation. This in turn creates favorable conditions for the efficient use of fixed capital, since motivated and managed personnel can better adapt to changes.
- Investments in social programs, including corporate social responsibility (CSR) projects, build a socially responsible enterprise. This, in turn, contributes to the sustainable development of society and the improvement of social conditions, which can have a positive impact on human capital as a whole.

3. APPLICATION FUNCTIONALITY

As a result, effective investments in fixed capital create favorable conditions for the development of human capital, and in turn, high-quality human capital contributes to a more efficient use of fixed capital, ensuring sustainable and productive development of the economy.

To conduct an economic analysis, we examined investments in fixed assets in areas of use, which tend to increase every year (Figure 4).

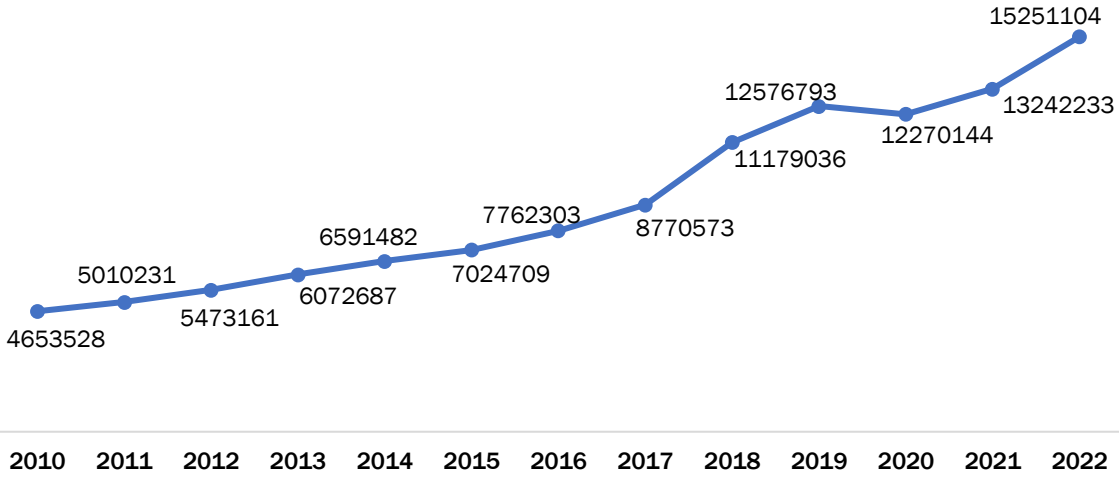

Figure 4. Investments in fixed capital by areas of use, million tenge

Source: Compiled by authors according to www.stat.gov.kz

To determine the forecast values of the indicator “Investment in fixed capital” for 2024-2026. A trend model was built, during which the following steps were completed:

A) Checking the time series for anomalous observations. For this purpose, Irwin's criterion was used (Table 3).

Table 3. Checking for anomalous observations in a time series

Year	Investments in fixed assets, million tenge	Observed value of Irwin's test	Calculation formulas
2010	4653528	0,100	Observed value of Irwin's test $\lambda_t = \frac{\lvert y_t - y_{t-1} \rvert}{\sigma_y}, \quad t = \overline{2,\ 13}$ Critical value of Irwin's criterion $\lambda_{0,05} = 1,5$
2011	5010231	0,130	
2012	5473161	0,168	
2013	6072687	0,146	
2014	6591482	0,122	
2015	7024709	0,207	
2016	7762303	0,283	
2017	8770573	0,676	
2018	11179036	0,392	
2019	12576793	0,086	
2020	12270144	0,273	
2021	13242233	0,564	
2022	15251104	0,100	

Source: compiled and calculated by authors

The original time series with a probability of 95% does not contain anomalous observations, because all observed values of the Irwin criterion are less than the critical value.

B) Using the criteria of “ascending” and “descending” series, it was found that the time series under consideration contains a trend component (Table 4).

Table 4. Checking for a trend

General view of the criterion for “ascending” and “descending” series (for a trend to exist, a violation of at least one inequality is sufficient)	Calculated values with the possibility of error $0,05 < \alpha < 0,0975$
$\nu(n) > \left[\frac{2n-1}{3} - 1,96\sqrt{\frac{16n-29}{90}} \right]$	3<5
$K_{\max} < [K_0(n)]$	9> 5

Source: compiled and calculated by authors

C) The approximation of the source data was performed using a first-degree polynomial:

$$y_t = a_0 + a_1 t + \varepsilon_t ,$$

The parameters of the selected growth curve were estimated using the least squares method. As a result, the following trend model was obtained:

$$y_t = 2668818,46 + 892124,66t$$

D) The quality assessment of the resulting model was carried out in two directions: checking the adequacy and assessing the accuracy of the model.

To check the adequacy of the model, a number of residuals were examined, i.e. discrepancy between levels calculated from the model and actual observations. The most important properties of the residual component are: the equality of the mathematical expectation to zero, the randomness of the residuals and their compliance with the normal distribution law.

The results of the analysis of a number of residuals in order to test the model for adequacy are shown in Table 5.

Table 5. Checking the adequacy of the model

Property being checked	*Statistics used*		*Border*	*Conclusion*
	Name, calculation formula	*Received value*		
Accident	Criterion for "peaks" (turning points) $p > \left[\frac{2}{3}(n-2) - 1{,}96\sqrt{\frac{16n-29}{90}}\right]$	5>4	4	Adequate
Normality	RS- criterion $RS = \frac{e_{\max} - e_{\min}}{S}$	3,10	2,80-3,78	Adequate
Equality of the mathematical expectation of the levels of a series of residues to zero	*t*- Student's statistic $t_{observ..} = \frac{\lvert\bar{e}\rvert}{S}\sqrt{n}$	0	2,23	Adequate

Source: compiled and calculated by authors

To assess the accuracy of the model, the average relative error of approximation was calculated:

$$E_{rel.} = \frac{1}{n}\sum_{i=1}^{n}\frac{|e_t|}{y_t}\cdot 100\% = 0{,}5\%,$$

value, which indicates a good level of accuracy of the model.
Thus, the model is of high quality and can be used for forecasting.

D) To calculate a point forecast, the corresponding variable values were substituted into the constructed model. To build an interval forecast, a confidence interval was determined at the significance level $\alpha = 0{,}05$.

Results of constructing point and interval forecasts for 2024-2026 are presented in Table 6.

Table 6. Point and interval forecasts of the volume of investment in fixed capital, million tenge for 2024-2026

Year	*Point forecast, million tenge*	*Interval forecast, million tenge*	
		Max	*Min*
2024	16 050 688,35	13 883 512,45	18 287 592,49
2025	16 942 813,01	14 705 908,87	19 255 161,81
2026	17 834 937,67	15 522 588,87	17 834 937,67

Source: compiled and calculated by authors

The conducted research, which focused on the economic assessment of the quality of human capital, is an important contribution to understanding the relationship between investment in fixed capital and its

diverse impact on economic development. The results of the analysis provide valuable practical and theoretical implications that can be considered in the context of formulating strategies and policies for the optimal use of human capital.

One of the key findings is the confirmation of the positive impact of investments in education and vocational training on the quality of human capital. This highlights the importance of continuous development of competencies and updating of knowledge to create a highly qualified workforce.

The analysis showed that companies that actively invest in developing the digital skills of their staff are more successful in adapting to technological changes and efficiently using fixed capital. The innovative activity of personnel is becoming a critical factor in the modern economy. It is noted that countries and regions that invest in social infrastructure and maintain a high level of social sustainability through investments in human capital ensure more stable economic growth. An integrated approach to investments in education, health and innovation creates the basis for sustainable development and efficient use of fixed capital.

Thus, economic assessment of the quality of human capital, with a focus on fixed capital investment, provides valuable scientific and practical insights that can be used to develop policies aimed at improving human potential and achieving sustainable economic growth.

CONCLUSION

Effective investment in fixed assets is a key factor in improving many aspects of human capital and ensuring sustainable and productive economic development. This approach influences various areas and ensures the targeted formation of high-quality human potential.

Effective investments in fixed capital include the development and introduction of new technologies. Employees with the necessary skills are able to successfully adapt to innovative changes, which contributes to the growth of the competitiveness of companies and the country as a whole. Investments in modern technologies and digital educational programs contribute to the development of innovative skills among employees. Training in new technologies and digital competencies increases their adaptability to rapidly changing market conditions.

Thus, effective investment in fixed assets not only contributes to increased productivity and competitiveness, but also creates sustainable and developed social structures, which ultimately favors sustainable and productive economic development.

REFERENCES

Awais Bhatti, M., Alnehabi, M. (2023), “The Role of Human Resource Management Practices on the Employee Performance in Manufacturing Firms in Saudi Arabia: Mediating Role of Employee Motivation”, *Transformations in Business & Economics*, Vol. 22, No. 2 (59), pp. 330-350

Boikivska, G., Mokhonko, G., Andrushkiv, R., Litvinova, L., Guk, O. (2022), “Modern technologies of personnel management in the context of the development of the digital economy”, *International Journal of Computer Science and Network Security*, Vol. 22, No. 2, pp. 283-289, https://doi.org/10.22937/IJCSNS.2022.22.2.35

Brita, D., Taran, F. (2022), “The role of human capital in structural change and growth in an open economy: effects of innovation and absorptive capacity”, The World Economy, Vol. 45, No. 4, pp. 1021-1049, https://doi.org/10.1111/twec.13184

Deng, J.R., Long, R.R. (2017), “A study of the impact of idiosyncratic human capital on China’s regional economic growth”, Science Research Management, Vol. 38, pp. 116–121.

Electronic resource. https://gtmarket.ru/

Gadzhiev, N., Konovalenko, S., Trofimov, M., Leontyeva, Zh., Akhmedova, K. (2019), “Mechanism for managing the formation of human capital in a post-industrial economy”, *Topical Problems of Green Architecture, Civil and Environmental Engineering,* pp. 5-15, https://doi.org/10.1051/e3sconf/202016410005.

Grabara, J., Cehlar, M., Dabylova, M. (2019), "Human factor as an important element of success in the implementation of new management solutions", *Polish Journal of Management Studies*, Vol. 20, No. 2, pp. 225-235. https://doi.org/10.17512/pjms.2019.20.2.19.

Jakubowska, A., Bilan, S., Werbiński, J. (2021), *"Chronic diseases and labour resources: "Old and new" European Union member states", Journal of International Studies,* Vol. 14, No. 1, pp. 129-138*,* doi:10.14254/2071-8330.2021/14-1/9

Kasa, M., Kho, J., Yong, D., Hussain, K., Lau, P. (2020), "Competently skilled human capital through education for the hospitality and tourism industry", *Worldwide Hospitality and Tourism Themes*., Vol. 12, No. 2, pp.175-184, https://doi.org/10.1108/WHATT-12-2019-0081

Khalilov, L., Yi, Ch.D. (2021), Institutions and entrepreneurship: Empirical evidence for OECD countries", *Entrepreneurial Business and Economics Review,* Vol. 9, No. 2, pp. 119-134. https://doi.org/10.15678/EBER.2021.090208

Kovacs, I. (2021), "Perceptions and attitudes of generation z consumers towards sustainable clothing: Managerial implications based on a summative content analysis", *Polish Journal of Management Studies*, Vol. 23, No. 1, pp. 257-276, https://doi.org/ 10.17512/pjms.2021.23.1.16.

Kumar, A., Anbanandam, R. (2020), "Analyzing interrelationships and prioritising the factors influencing sustainable intermodal freight transport system: A grey-DANP approach", *Journal of Cleaner Production*, Vol. 252, pp. 119769.

Liu, C., Li, K., Jiang, P., Li, D., Su, L., Li, A. (2021), "A hybrid multiple criteria decision-making technique to evaluate regional intellectual capital: Evidence from China", *Mathematics*, Vol. 9, pp. 9141676.

Lulewicz-Sas, A., Kinowska, H., Fryczyńska, M. (2022), "How sustainable human resource management affects work engagement and perceived employability", *Economics and Sociology*, Vol. 15, No. 4, pp. 63-79, doi:10.14254/2071-789X.2022/15-4/3

Mubarik, M.S., Kazmi, S.H.A., Zaman, S.I. (2021), "Application of gray DEMATEL-ANP in green-strategic sourcing", *Science Research Management*, Vol. 64, 101524.

Navickas, V., Kovacova, P., Grencikova, A., Spankova, J., (2023), "Work Engagement and Human Capital: The Role of the Manager in Employee Work Engagement", *Transformations in Business & Economics*, Vol. 22, No. 1 (58), pp. 51-64.

Nurekenova, E.S., Sholpanbayeva, K.Z., Apysheva, A.A., Rakhimberdinova, M.U., Shaikhanova, N.K. (2022), "Assessment of the economic efficiency of industrial enterprise management during the Kazakhstan integration into the EAEU", *Polish Journal of Management Studies*, Vol. 26, No. 1, pp. 233-249, https://doi.org/10.17512/pjms.2022.26.1.15.

Official resource of Industry qualification framework (2019), *Human Resource Management*, pp. 106-120.

Official resource of Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan for 2010-2020. www.stat.gov.kz

Raitskaya, L., Tikhonova, E. (2020), "Review of reviews as a tool for identifying trends in the field of knowledge under study", *Higher education in Russia*, Vol. 29, No. 3, pp. 37-57. https://doi.org/10.31992/0869-3617-2020-29-3-37-57

Sakytė-Statnickė, G., Bilan, S., Savanevicienė, A. (2023), "The impact of work engagement of different generations on organisational engagement", *Journal of International Studies*, Vol. 16, No. 4, pp. 136-152. doi:10.14254/2071-8330.2023/16-4/9

Savanevicienė, A., Salickaitė-Zukauskienė, R., Silingienė, V., Bilan, S. (2022), "Ensuring sustainable human resource management during the COVID-19 pandemic: The case of Lithuanian catering organisations". *Economics and Sociology*, Vol. 15, No. 3, pp. 121-142. doi:10.14254/2071-789X.2022/15-3/7

Scavarda, A., Daú, G., Scavarda, L.F., Caiado, R.G.G. (2019), "Analysis of corporate social responsibility and Industry 4.0 with an emphasis on the youth generation", *Sustainable Human Resource Management Framework*, Vol. 11, No. 18, pp. 130-136, https://doi.org/10.3390/ su11185130

Stryzhak, O. (2019), "Institutional system of human development and institutional environment: Features of the relationship", *International conference "International transport infrastructure, industrial centers and corporate logistics",* pp. 49-55. https://doi. org/10.1051/shsconf/20196706049

Sultana, T., Dey, S.R., Tareque, M. (2022), "Exploring the linkage between human capital and economic growth: A look at 141 developing and developed countries". *Economic Systems*, Vol. 46, No. 3, 101017, DOI: 10.1016/j.ecosys.2022.101017

Turgel, I.D., Fazylzhan, D. (2023), “The Concept of Human Capital: Categorical Analysis of the Evolution of Approaches”. *Economics: The Strategy and Practice,* Vol. 18, No. 1, pp. 180-195, https://doi.org/10.51176/1997-9967-2023-1-180-195.

Whysall, Z., Owtram, M., Brittain, S. (2019), “New problems of talent management in Industry 4.0”. *Journal of Management Development,* Vol. 38, pp. 118-129, https://doi.org/10.1108/JMD-06- 2018-0181.

Wielechowski, M., Cherevyk, D., Czech, K., Kotyza, P., Grzęda, Ł., Smutka, L. (2021), “Interdependence between human capital determinants and economic development: K-means regional clustering ap-proach for Czechia and Poland”, *Entrepreneurial Business and Economics Review,* Vol. 9, No. 4, pp. 173-194. https://doi.org/10.15678/EBER.2021.090411