Human Capital Valuation in the Knowledge Economy of Kazakhstan

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Abstract
The aim of this work is to provide a variety of approaches and methods for assessing the value of human capital at the macro and micro levels, which are used in the economic literature. Human capital is a resource and mechanism of the organization's innovative activity; the effectiveness of its use affects the development of the economy as a whole. The authors critically and comprehensively review the various existing methods for assessing human capital and systematize them. The study considered an example of the analysis of the human development index (HDI) in Kazakhstan. Trends in HDI formation and use have been identified, and a multifactorial regression model of HDI has been developed. The authors propose to calculate the assessment of the value of the human capital of an organization using the example of the author personally. To assess the value of human capital, it is necessary to use a cost-based methodology. The proposed method considers the initial cost of human capital of a particular employee and the cost of knowledge, acquired by him as a result of advanced training. A multifactorial correlation-regression model of the HDI has been developed.

Keywords
Cost, Education, Evaluation, Health Care, Human Development Index, Investments

JEL Classification
J24, E24, M41

Introduction
"The most valuable assets of a 20th-century company was its production equipment. The most valuable asset of a 21st-century institution (whether business or nonbusiness) will be its knowledge workers and their

productivity", – suggested the management guru P.F. Drucker in 1999 (Drucker, 1999, p. 79). According to the research of the financial organization Ocean Tomo related to intellectual property, there was a change in the structure of assets: in 1975, more than 80% of the value of organizations belonging to the S & P500 were tangible assets; in 2015, the situation is diametrically opposite — 84% of the market value of organizations from among the S & P500 are intangible assets (Sirazieva, 2015). Such a change in the structure of an organization's assets led to a reassessment of the value of human resources.

The term "knowledge economy" introduced the Austro-American economist, President of the International Economic Association, F. Machlup in 1962 in his work "The Production and Dissemination of Knowledge in the USA" (Machlup, 1966), meaning it is simply a sector of the economy. Since then, this concept has become firmly established in scientific terminology, and today the knowledge economy is understood as a type of economy where knowledge plays a crucial role, and the production of knowledge becomes the most important source of growth.

In the framework of the new development paradigm of countries and the world community, when evaluating a business, a reasonable investor considers not the cost of machines, equipment, land, but buys people who work on these tangible assets. Therefore, it is necessary to estimate the value of the human capital of an organization. The 20th century was the era of human capital that became known as the most important asset and resource for creativity and innovation and affects the growth of societies more than any other factor and is a major motivation for people to choose careers (Chitsaz et al., 2019).

Science and practice have developed an extensive list of methods, differing from each other both in the level of consideration of human capital and in the approach used, each of them has its own methodologies focused on one of the aspects of the assessment of the value of human capital. However, the main problem is that, to date, there is no complete methodology for assessing the value of human capital. Also, there are no statistical data necessary for the analysis. (Leddy, 2018)

The purpose of this study is to provide various approaches and methods for assessing the value of human capital at the macro and micro levels, which are used in the economic literature, since human capital is a resource and mechanism for the innovative activities of any organization, and the efficiency of using human capital affects the development of the economy as a whole.

The research goals are:

- to consider the available approaches and models for assessing the value of human capital;
- to analyze the existing methods for assessing the value of human capital;
- to test methods for assessing human capital at the macro and micro levels.

To estimate the value of human capital, a cost-based methodology must be used. The proposed method takes into account the initial costs of the human capital of a particular employee and the cost of knowledge gained by him as a result of professional development.

Literature review

An analysis of existing approaches to estimating the value of human capital showed their great diversity. Among the names of Western economists who considered the problem of estimating the value of human capital are such well-known authors in the history of Western economic thought: W. Petty, I. Fisher, J. Kendrick, M. Friedman, K. Marx T., A. Marshall, T. Schulz, G. Becker and others.

Back in the XVII century, the ancestor of the English classical political economy, W. Petty, for the first time tried to estimate the monetary value of the productive properties of the human person. In his opinion, "the value of the majority of people, like land, is equal to the twenty-fold annual income they bring". The value of the entire population of England at that time he estimated at about 520 million pounds, and the cost of each resident — an average of 80 pounds sterling. W. Petty estimated the value of the stock of human capital using the procedure of capitalization of earnings as a life annuity, with a market interest rate; he determined the amount of his earnings by withdrawing personal income from national income (Petty, 1940).

Later, K. Marx noted that the category of labor cost is close in its content to the concept of the costs of reproduction of labor, and when calculating its value during a person's life, it is the sum of life-long maintenance costs and investment in human capital (Marx & Engels, 1961).

Schulz was one of the first to calculate the value of human capital in the United States in 1961. He used the following method: the cost of one year of study at each level was multiplied by the number of person-years of education accumulated by the population at one time or another. The number of person-years of education was determined adjusted for the same duration of the school year. Estimates of the educational fund are calculated on the basis of not initial, but replacement value, i.e. the basis is the value of the cost of education, relating not to the time of its receipt, but to the year of counting (Schultz, 1980).

The American economist J. Kendrick proposed the cost method of calculating the value of human capital on the basis of statistical data to calculate the accumulation of investments in a person. J. Kendrick included in the investment in human capital the expenses of the family and society for raising children until they reach working age and receive a certain specialty, for retraining, advanced training, health care, for labor migration, etc. In savings, he also included investments in housing, household goods for long-term use, stocks of goods in families, costs of research and development. As a result of calculations, he received that human capital in the 1970s accounted for more than half of the accumulated national wealth of the United States (excluding government investment) (Kendrick, 1978).

The well-known English economist, founder of the neoclassical trend in economics A. Marshall (1993) admitted that estimating the capital value of a person can be useful, and discussed the approach of capitalizing net earnings to the assessment of human capital. A. Marshall emphasized the similarity of the processes of investing in human and inanimate material assets.

Fisher believed that the use of capital is the receipt of interest as the universal form of any income (wages, profits, rents), the discounted amount of future income and is its value (Fisher, 2002). This method of evaluating human capital reflects only income that will be received in the future and does not include investments in human capital, assessment of professional and educational level of personnel, costs of scientific research, health care, assessment of intellectual property, etc.

Friedman and Hayek understand human capital as a certain fund that provides permanent (continuous) income to labor, which represents the weighted average of expected future income receipts. Property and income are considered as interrelated phenomena. In this case, the property can be represented in the form of the capitalized value of the future income stream, determined by means of discounting (Friedman & Hayek, 2003).

The concept of human capital in the modern economic theories

The current trends of the world economy reflect the transformation of the role of man, which is not only the goal of social production, but also the most important resource of social and economic progress. A person becomes a significant factor and a driving force of production, since he has unique abilities not only to reproduce, but also to "add new value" due to his physical and intellectual potential. If we turn to the experience of technologically developed countries, the transition to the knowledge economy is based primarily on the ability of a person to create innovations that save traditional resources and generate huge profits. In fact, the competition in the global economy turns into a competition of new knowledge, which is carried by a person. This understanding of its role is growing throughout the world, and there is a gradual reversal of politics towards the world strengthening and increasing human potential due to increasing investments in its quality.

Modern economists treat the concept of human capital differently. But they agree, that human capital is the main driving force of society, and that the state, and not only the individual, should pay special attention to the formation of human capital.

Developing the definitions, proposed by various authors, we formulated: human capital — it is a set of knowledge, skills and skills of a person, obtained as a result of investments, obtained in the process of

education and practical human activity, the effective use of which determines labor productivity and can become sources of income for a person, family, organization and society as a whole. In other words, human capital is a form of capital and a measure of the ability to generate income embodied in man, which clearly has a value estimate (Perepelkin et al., 2016).

Human capital cannot be the subject of sale, it can only be rented by signing a contract of employment. For the period of employment, the employer buys the right to use the services of the employee's labor, and not the labor itself, which continues to be owned by the employee. Therefore, when developing strategic plans for the development of an organization, it is necessary to consider the size and structure of investments in human capital.

Investing in human capital implies for the employee — increasing income levels, job satisfaction, improving working conditions, increasing self-esteem, improving the quality of life. For an employer, this is an increase in labor productivity, a reduction in the loss of working time and an increase in production efficiency, which ultimately contributes to an increase in the organization's competitiveness. For the state, it is an increase in the well-being of citizens, an increase in gross income, and an increase in the economic activity of citizens.

The source of investment in human capital can be the state, non-state public funds and organizations, regions, individual organizations, households, international funds and organizations, as well as educational institutions.

McConnell and Brü (1993) distinguish three types of investments in human capital:

1) education expenses, including general and special, formal and informal, on-the-job training;

2) the cost of health, resulting from the cost of disease prevention, medical care, diet, improving housing conditions;

3) mobility costs, due to which workers migrate from places with relatively low productivity to places with relatively high productivity.

Since education has an impact on all components of human capital, investment in education is one of the most important types of investment. The knowledge, enshrined in human capital and technology, are the engines of productivity and economic growth. According to experts, in industrialized countries, about 40% of GDP is already created on the basis of knowledge, and the success of the national economy is determined by the efficiency in the collection and use of knowledge and technology. Investments in knowledge, the creation of knowledge networks are key factors for the development of new introductions, and their distribution is a source of productivity growth and competitiveness. Thus, investment in education leads to an increase in the value of human capital (Kasayeva, 2013).

Education and training in the workplace increase the level of human knowledge, and, consequently, increase the amount and quality of human capital. Investment in education on the substantive basis is usually divided into formal and informal. Formal investments are the acquisition of secondary, special and higher education, as well as the acquisition of a second education, vocational training at work, various courses, training in a magistracy, doctoral studies, etc. Informal is self-education of the individual; this type includes the reading of developing literature, perfection in various types of art.

Once the firm's strategic goal has been identified, the purpose of human capital accounting is to enable prudent, cost-effective investments and trade-offs in human capital. In the course of setting and administering human capital strategies, firms will inevitably address several threshold issues that may seem philosophical, but are fundamentally empirical in nature (Henderson, 2014).

Supporters of the concept of human capital management are confident that, by measuring the impact, that employees have on the financial performance of an organization, they can select, manage, evaluate and develop the capabilities of their employees in such a way as to transform their human qualities into meaningful financial results of the organization. Heads of organizations are gradually realizing the important link between human capital and the financial results of an organization — a link, that traditional accounting methods are incapable of considering.

It should be borne in mind, that with proper management, the maximum amount of profit from investments in human capital is almost three times higher than the profit from investments in technology. The study of the dependence of labor productivity on education showed, that with a ten percent increase in the level of education, productivity increases by 8.6%. With the same increase in share capital, productivity rises by 3–4% (Lisenkova, 2010).

In line with this, the organization's human capital management can be based on using the cyclical interdependence model of employee motivation and the results of an organization's economic activities. This model is presented in Figure 1.
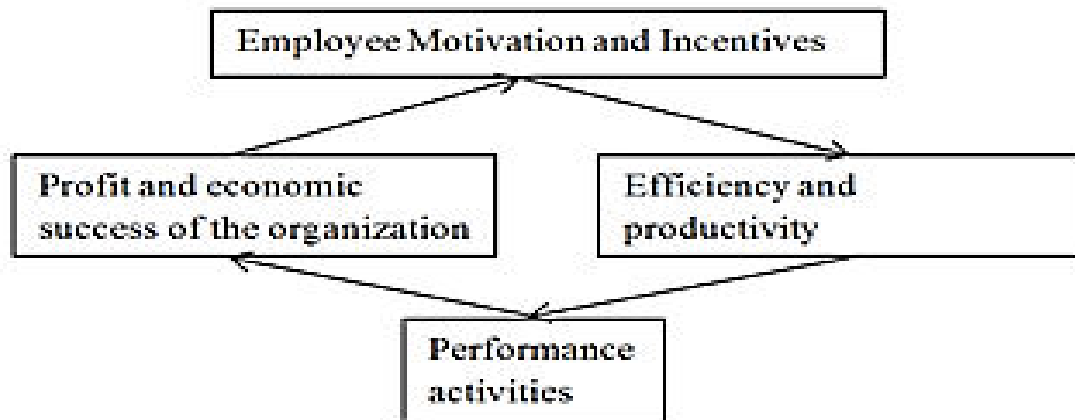

Figure 1. Human capital management model

Approaches and methods for assessing the value of human capital

The analysis of approaches and methods for assessing the value of human capital allowed us to identify the criteria for their classification: by economic level (macro, micro), by the interpretation of human capital, by the approach used (Danilovskikh & Avakyan, 2015).

The cost of the human capital of an individual employee is his value in equivalent model for a particular organization, considering his level of education, age and work experience in the position he occupies. Therefore, the process of assessing the value of the human capital of an organization is complex and highly individual, due to the fact that each employee is a unique personality and when evaluating it is necessary to consider the peculiarities inherent to this particular employee.

As an economic category, human capital can be assessed using qualitative and quantitative criteria (Nesterov, 2017).

Qualitative criteria reflect management models and methods for evaluating human capital. Such management models, on the basis of which systems for evaluating human capital are developed, are, for example, the balanced scorecard, the European Foundation for Quality Management (EFQM) model. (Nagyova & Pacaiova, 2018).

Systems for evaluating human capital based on certain quantitative criteria are based on value and natural approaches to its definition.

The main quantitative approach is the educational model, which uses temporary estimates of human capital, reflected in man-years of study. According to this model, the more time spent on the education of a person, the more human capital it possesses. Such an approach assumes, that the time, spent on education directly determines the level of education of a person, therefore, it can be used to evaluate professional knowledge and skills of a person.

An alternative to the educational model is an analytical model for assessing human capital. The analytical model for evaluating human capital allows for an approximate calculation of the value of the human capital of an organization based on an individual assessment of the personal capital of workers (Czerewacz-Filipowicz & Kogut, 2019).

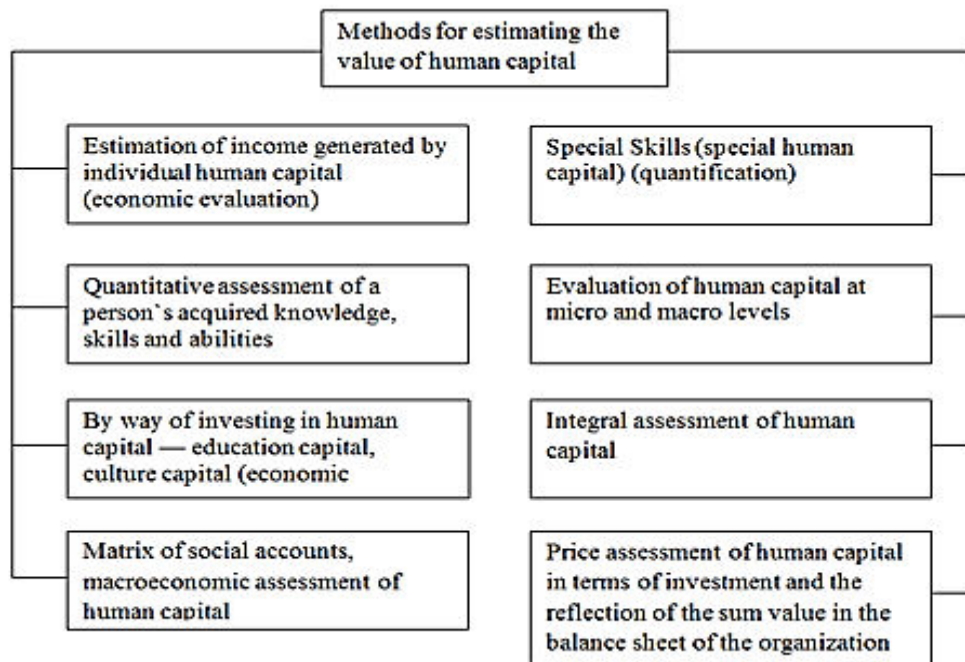To estimate the value of human capital can be applied the methods shown in Figure 2.

Figure 2. Methods used for evaluation cost of human capital

Human capital is overvalued. At the same time, employees' knowledge is revalued based on the influence of the following factors (Noskova, 2013):

- investment in staff development; correction of knowledge on the coefficient of obsolescence and forgetting of a part of accumulated knowledge;
- adjustment of knowledge on the coefficient of acquired experience and professionalism;
- adjustment of knowledge to the individual characteristics of the employee.

An understanding of the structure and value of human capital will allow to:

- use in the financial and economic activities of the key asset of modern business — "human capital", which will help improve the competitiveness of the organization;
- protect business from adverse internal and external factors;
- manage intellectual assets, increase intellectual potential and thereby increase the capitalization of the organization.

Human capital is not an independent (monetary) company value. This capital must first interact with a company's physical and/or financial assets, as well as with its other intangible assets to contribute to value creation. Consequently, human capital has no intrinsic value for a company. Inevitable problems emerge from these characteristics. The extent, to which a company's human capital influences its financial success, can therefore very rarely be unambiguously determined (e.g., improved employee motivation's influence on a company's success cannot be easily quantified). However, it should be noted that our knowledge of human capital's mechanisms and drivers is relatively limited (Möller et al., 2011).

The cost of human capital at the macro level is considered as social transfers rendered to the population, both in kind and in cash, as well as preferential taxation, which is the target expenditures of the state. Such costs include household expenditures for the preservation and restoration of human capital.

The cost of human capital at the micro level is the cost of the organization's costs of restoring the human capital of the organization. Namely, professional development of already employed workers; medical examination; payment of sick leave certificates; labor protection costs; voluntary medical insurance paid by the organization; payment of medical and other social services for an employee of the organization; charitable assistance to social institutions, etc. (Miller, 2017).

The whole variety of methods for evaluating human capital comes down to several basic approaches, the main ones are: cost and income (rent) (Bogatova, 2013; Oshchepkova, 2016).

The cost approach is based on summing up the total expenditures on education, professional training and other costs of society, which are usually attributed to investments in human capital (maintaining health, looking for a job and relevant information about earnings, migration). The cost of human capital is determined by the accumulation of net investments in the development of a person as a future employee at all stages of his life cycle.

The income (rent) approach implies an assessment of the income earned by employees, which reflects the return on funds invested in the appropriate educational and qualification level. The application of the income approach to the assessment of human capital involves, above all, the use of capitalization of income derived from the use of this type of capital. In this case, the accumulation of human capital by the current generation and the potential of its use in economic activity during the employee's work activity are reflected. (Kenton, 2019)

The overwhelming majority of the methods allows to evaluate human capital at the micro level, the main part of which is presented in Table 1.

Table 1. Methods for assessing the value of human capital at the micro level

Authors	Formulas for calculation
Flamholtz (2012,)Morse (1973)	$NB = -I_0 + \sum_j \sum_i [(R_{ij} - CE_{ij})p_{ij}/(1+r)n] - \sum_j [(AC_j - DC_j)kn_j/(1+r)n]$, (1) where: NB - net benefit from finding employees in the organization; I_0 - initial investment in employees; R_{ij} - income received by the organization from the employee's work; CE_{ij} - current employee costs; AC_j - alternative costs associated with the dismissal of an employee; DC_j - direct payments to an employee upon dismissal; r - discount rate; n - the estimated number of years the employee has been in the organization; p_{ij} - the likelihood that the employee will continue to work in the organization; kn_j - the likelihood that the employee will work in the organization n years
Becker (1975)	$V_a = \sum_{i=a}^{n}(B - C) \cdot (1+i) - t$, (2) where: V_a - evaluation of the human capital of an employee at age a; B - total wages; C - part of the wage attributable to labor; n - age at which a person's active labor activity ends; i - interest rate
Friedman & von Hayek (2003)	$W_1/(1+r) + W_2/(1+r)2 + \cdots + W_n/(1+r)n$, (3) where: W_n - individual expected annual earnings from using human capital; n - the lifetime of the individual in years, Permanent income can be represented by the formula $D_n = r \cdot W_n$
Ilinsky (1996)	$HC = CE + CHe + CC$, (4) where:

	HC - human capital; CE - education capital; CHe - health capital; CC - cultural capital
Fisher, Dornbush,, & Shmalenzi (2002)	$D_c = D_t/(1 + i)t,$ (5) where: D_c - this is a certain amount of money, which, being invested for t years under the rate of interest i; D_t - future income; i - the current interest rate; t is the number of years
Ivlieva (2005)	The value of human capital will be equal to: $V_h = C_h(V_{h.exp} + V_{h.inc}),$ (6) where: V_h - cost of human capital organization; C_h - human capital utilization rate; $V_{h.exp}, V_{h.inc}$ - the cost of the formation of the human capital of the organization and income from its use, respectively
Tsarev V. V., Evstratov A.Yu. (2008)	$C = \sum_{i=1}^{n} C_{it}(1 + r_t) - t + \sum_{i=1}^{n} C_{it}^*(1 + r_t) - t + I_t + P + I,$ (7) where: C_{it} - capital spent by the i-th student to receive vocational education during the period t; C_{it}^* - the cost of funds for the purchase of educational and methodical literature, stationery; I_t - total discounted incomes received by the employee during a certain period of work in the organization; P - the share of gross profit created by a specialist in a particular year in the organization; I - investments in professional development; i - student of an educational institution; t - period of time for students to receive professional education and the subsequent work of a specialist in an organization; r_t - average discount rate in period t
Allaverdyan (2003)	$S = W \cdot Ghc + I \cdot t,$ (8) where: S - the cost of human capital of the employee; W - the amount of the employee's salary (actual or planned); Ghc - goodwill human capital worker; I - staff investment in one year; t – period
Podberezkin (2012), Arabyan (2010)	$HC = \sum_{i=1}^{n} HC_i = \sum_{i=1}^{n}(EC_i - CEM_i + VAK_i + \gamma_3 El_i + ClK_i),$ (9) where: HC - the amount of money needed to attract, operate, retain employees working in the organization; HC_i - cost of human capital of an employee of the organization; EC_i - employee cost; CEM_i - the value of outdated employee knowledge, which is determined by the formula $CEM_i = \gamma_1 EC_i$; VAK_i - the value of the acquired knowledge and skills of the employee, which is determined by the formula $VAK_i = \gamma_2 EC_i$; El_i- employee investment cost; ClK_i - the cost of implicit knowledge, abilities of the employee, which is determined by the formula $ClK_i = \gamma_4 EC_i$; $\gamma_1, \gamma_2, \gamma_3, \gamma_4$ – weights; n - is the number of employees.
Oksinoyd & Rozina. (2014)	$HCW_a = \sum(W_{tot} - W_p) \cdot (1 + S_i) - n,$ (10) where: HCW_a– human capital assessment of a worker at the age of a; W_{tot} – total wage; W_p – part of the wages of labor; n – age at which a person's active work activity ends; S_i – interest rate

Ivanova, Trofimova, Valyaeva, & Heinonen (2016)	The value of the total human capital G consumed per year is calculated:	
	$G_p = \Sigma m_i\, G_{pi}$,	(11)
	where:	
	G_{pi} – is the consumed human capital of the i-th age group $G_{pi} = g_{p1} \cdot N_i \cdot t_i$;	
	m – is the number of age groups of the population;	
	t_i – is the average age of the population of the i-th age group.	

The cost approach of estimating the value of human capital was followed by T. Schulz, V.V. Tsarev, A.Yu. Evstratov, V. Allaverdyan, K.N. Chigoryaev, N.N. Ivliev and others.

The method of assessing the individual cost of an employee of the organization, proposed by Tsarev and Evstratov (2008) is based on cash flow discounting. In our opinion, when evaluating human capital on the basis of the cost approach, the operation inverse to discounting should be applied — compounding.

The method of calculating the cost of an organization's personnel potential, proposed by Allaverdyan (2003), is noteworthy for its extraordinary nature. When valuing or selling an organization, it can create a larger (excess) profit, than the market valuation of all assets minus debt. Despite the fact, that we are talking about the cost of personnel potential of the organization, and not about the cost of human capital, however, some elements of this methodology can be used to determine the value of human capital.

According to the method of Chigoryaev, Skopintseva and Ulischenko, all costs associated with human capital, are divided into three main groups: payroll (all payments to employees, including wages, taxes, bonuses, incentive allowances, etc.); intellectual capital costs (costs of training, retraining, staff development, participation in conferences; research costs, etc.); health capital costs. By "health capital" is meant an investment in a person for the purpose of building, maintaining and improving his health and efficiency, for example, expenses related to health protection (conducting routine inspections of employees, additional health insurance and other preventive and preventive measures diseases) (Chigoryaev et al., 2008).

Each organization, due to the specifics of its activities and the individuality of the organizational, personnel structure, can independently determine a system of indicators for calculating human capital. However, a significant drawback of these approaches is the difficulty in collecting the necessary statistical information on the industry, and in some cases, when the activity of the enterprise is specific, the absence of such data. This problem is also characteristic of the method, proposed by Ivlieva (2005).

Ilyinsky (1996) distinguishes in the structure of the cost of human capital the costs of general education, special training, health care, and the movement of labor.

Sasongko, Huruta and Pirzada (2019) conclude that labor force in Indonesia participation is declining with the decline in unemployment rate, suggesting that unemployment is not reliable indicator of macroeconomic performance as it may have been in the past.

Organizational learning is becoming increasingly important for the strategic renewal of organizations in the digital and high-tech economy. Organizations with a huge variety, especially successful in the current environment, when firms must be effective and quickly adapt to change. Research results show differences in training between marketing and production units, as well as various methods of personnel management and types of human capital. Human capital mediates between the practice of HRM and learning (Díaz-Fernández et al., 2017; Kogut et al., 2019).

Human capital can be formed through education and professional experience gained in the workplace, training, consumption and in-depth knowledge of the economic system. Among these factors, education and professional experience are considered as the two most important aspects of human capital. Education, an important component of human capital, can help people improve their cognitive abilities and solve ethical problems of human capital in auditing (Xingqiang et al., 2018).

According to M. Friedman (2003), human capital can be represented as a special property resource of an organization that generates income for it, therefore, "Human capital can be represented as a discounted wage received by an employee during the entire working-age period of life". According to this, human capital and the income received by an employee from its use can be objectively estimated. Human capital can be defined as the weighted average of annual earnings, expected for the entire working period of life, those, permanent employee income, which brings him human capital as a component of property (Nickolas, 2019). When

using this approach directly in an organization to assess human capital, one should consider the current age of existing employees.

Much attention was paid to the assessment of human capital in his theory by G. Becker, who carried out a statistically correct calculation of the economic efficiency of education. To determine income, for example, from higher education, life earnings of those who graduated from college, deducted life earnings of those, who did not go beyond high school. The costs of training, along with direct costs (tuition fees, hostel, etc.), contain "lost earnings" as the main element, i.e. income, lost by students for years of study. Essentially, lost earnings measure the value of the time of students spent on training, and are alternative costs of its use. Having determined the return on investment in school as the ratio of income to cost, Becker (1975) received a figure of 12–14% of annual profit.

As one of the options for financial evaluation, a model based on a combination of Flamholtz (2012) models and Morse (1973) net gains can be used. The model is based on calculating the present value of the net benefit stream from the fact, that employees are in the organization and includes three components: initial investment in employees; reduced profit stream from the work of co-workers; restoration costs for the dismissal of workers (Morse, 1973).

According to M. Friedman and F. von Hayek, human capital can be represented as a special property resource of an organization, that generates income for it, consequently, "human capital can be represented as a discounted wage received by an employee during the entire working life" (Friedman and Hayek, 2003). According to this, human capital and the income received by the employee from its use can be objectively estimated. Human capital can be defined as the weighted average of annual earnings expected for the entire working period of life, i.e. constant employee's return, which brings him human capital as a component of property. (Kenton, 2019)

Rosina (2014) notes that according to the principle of capitalization of future income, based on "the position of preference of benefits over time, people estimate a certain amount of money or a set of benefits in real time more, than the same amount or set of benefits in the future", each individual is considered the totality of the labor unit and the human capital embodied in it. Consequently, the wages, that each employee receives, can be regarded as a direct reflection of the market price of his material essence and rental income from the human capital invested in this essence.

With the conclusions of M. Friedman, F. Hayek and E.V. Rosina doesn't agree at all, since wages are part of the total social product, that goes into the personal consumption of workers in accordance with the quantity and quality of labor expended, and cannot serve as an estimate of human capital. In addition, human capital is recognized as an asset, and wages relate to the obligations (liabilities) of the organization.

Methods

Measures on human capital may serve many purposes. One is to better understand the drivers of economic growth. Another is to assess the sustainability of a country development path/sustainability, in its intergenerational perspective, is usually understood as requiring that the total stock of resources (or "capital") available in a country is kept unchanged (on a per capita basis) over time (UNECE, OECD, Eurostat 2009); such assessment requires a measure of the stock of human capital, that could be compared to those for other types, a requirement, that calls for monetary measures (Riccardini, 2015).

The main method of assessing human capital at the macro level is the calculation of the HDI. HDI is calculated by the United Nations Development Program (UNDP) and is used as part of a special series of UN human development reports. The HDI assesses the country's achievements, given the state of health, education and the actual income of its citizens (United Nations, 2010; Yakunina & Bychkov, 2015; Indeks chelovecheskogo razvitiya, 2020). The index is a cumulative indicator of human development in the country and measures the country's achievements in terms of longevity, education and a decent standard of living for its citizens, for whom their indices are assessed (UNDP, 2019; Worldometer, 2020):

1.   The index of life expectancy: health and longevity, measured by the indicator of the average life expectancy at birth:

$$\text{LEI} = (\text{LE} - 25)/(85 - 25), \qquad\qquad (12)$$

where:

LE – life expectancy.

2. Education Index: access to education, measured by the average expected length of education for children of school age and the average duration of education for adults:

$$EI = (MYSI + EYSI)/2, \qquad (13)$$

where:

$MYSI = MYS/15$ - average duration of study;

$EYSI = EYS/18$ - Expectancy Duration Index,

MYS – average population duration in years;

EYS – the expected duration of education of the population still receiving education in years.

3. Income index: a decent standard of living, measured by gross national income (GNI) per capita in US dollars at purchasing power parity (PPP):

$$II = [\ln(GNIpc) − \ln(100)]/[\ln(7500) − \ln(100)], \qquad (14)$$

where:

$GNIpc$ − GNIper capita.

These three dimensions are standardized as numerical values from 0 to 1, the geometric mean of which is the cumulative HDI index in the range from 0 to 1. States are then ranked based on this indicator. HDI:

$$HDI = (LEI \cdot EI \cdot II)/3. \qquad (15)$$

To assess the value of the human capital of an organization, i.e. at the micro level, we offer the following method:

1. Expenses for the formation of the human capital of an organization are only expenses, which increase the productive capacity of people, for example, investments in the field of secondary vocational, university and postgraduate education. They consist, mainly, of direct costs of the state, organizations and individuals in the field of education and training. Expenses for training in secondary schools are not considered, since in Kazakhstan basically everyone has a secondary education and training is carried out at the expense of the state (Kau, 1998).

2. By the time of the conclusion of the employment contract, the employee agrees with the employer the value of his human capital in monetary terms. To determine the value of human capital, we need documents confirming the cost and fact of tuition payment. Assessment of the actual knowledge and skills of the employee is checked by testing.

3. The individual cost of human capital of an employee is equal to:

$$IHC = (C + I)^*[(Ar − Ac)/(Ar − 21)]^*TR, \qquad (16)$$

where:

C – employee capital investment in vocational education;

I – employee investment in advanced training;

Ar – retirement age;

Ac – current age;

21 – age, at which work begins;

TR – test results, %.

4. The individual cost of human capital of an employee (taking into account the growth in time of the invested monetary amount - compounding) is calculated by the formula:

$$HC = \sum_k TC_k[M(1 + r_j)]^* [(Ar − Ac)/(Ar − 21)]^* TR/100 + \sum_j QC_k[M(1 + r_j)]^* [(Ar − Ac)/(Ar − 21)]^*TR/100 \qquad (17)$$

where:

TC_k – the cost of funds for training the employee for the k-th period, dollars;

QC_k – the cost of funds for raising the qualifications of the employee for the k-th period, dollars;

r_j – increment rate for the j-th year;

M – multiplication.

r_j, the refinancing rate of the National Bank of the Republic of Kazakhstan is accepted.

5. The total human capital of the organization will be equal to:

THC =

$$\sum_i \sum_k TC_{ik}\left[M(1 + r_j)\right]^* [(Ar - Ac)/(Ar - 21)]^* \, TR/100 +$$

$$\sum_i \sum_k QC_{ik}\left[M(1 + r_j)\right] \; [(Ar - Ac)/(Ar - 21)]^* \, TR/100, \qquad (18)$$

where:

TC_{ik} – the cost of funds for training the i-th employee for the k-th period, in dollars;

QC_{ik} – cash expenditures on employee i-th staff development for the k-th period, in dollars.

Results and discussion

The calculation of the HDI in Kazakhstan

According to reports of UNDP human development reports for 2010–2017 in Kazakhstan there was a positive trend in the development of human capital, as evidenced by the human development index (Table 2). It is important to note, that in 2008 Kazakhstan was in the group of countries with an average level of human development, then from 2009 it moved to the group with a high level of development, successfully maintaining its position until today.

Table 2. Dynamics of indices and human development indicators in Kazakhstan

Years	LEI (expected lifespan)	EI (education index)	MYS (average duration of study)	EYS (expected duration of study)	II (GNI per capita)	HDI (place in the ranking of countries)
2010	0.766 (65.4)	0.795	10.3	15.1	0.699 (10234)	0.714 (66 out of 169)
2011	0.775 (67.0)	0.799	10.4	15.1	0.704 (10585)	0.745 (68 out of 187)
2012	0.775 (67.4)	0.799	10.4	15.3	0.702 (10451)	0.754 (69 of 186)
2013	0.715 (66.5)	0.763	10.4	15.0	0.796 (19441)	0.757 (70 of 187)
2014	0.633 (69.4)	0.751	11.7	15.0	0.807 (20867)	0.788 (56 out of 188)
2015	0.763 (69.4)	0.807	11.4	15.0	0.815 (20876)	0.794 (56 out of 188)
2016	0.806 (69.6)	0.807	11.7	15.0	0.821 (22093)	0.788 (56 out of 185)
2017	0.815 (72.4)	0.813	11.8	15.1	0.824 (22900)	0.800 (58 out of 189)
2018	0.750 (70.0)	0.814	11.8	15.1	0.831 (24230)	0.800 (58 out of 189)

The HDI in Kazakhstan for 2010 is equal to 0.714 and the republic is ranked 66 out of 169 countries. Compared to 2009 (82 place), Kazakhstan has risen by 16 steps. But here it is worth considering, that some countries are not included in the general list. So, if in the general list there were earlier 182 countries, then in 2010 there were 169. Over this period, the HDI of the republic increased from 0.650 to 0.714, i.e. by 10% or by an average of 0.5% per year.

In 2011 Kazakhstan ranked 68th out of 187 countries, according to the UNDP Human Development Report "Sustainable Development and Equal Opportunities: A Better Future for All", dedicated to the influence of environmental factors on the quality of life, as well as the problem of achieving sustainable and ensure equal

opportunity progress. In general, the position of Kazakhstan in the HDI over the past eight years is estimated as stable.

In 2012, Kazakhstan ranked 69th out of 186 countries (in 2011 — 68th out of 187) with the following indicator values: life expectancy (67.4 years); expected duration of study (15.3 years); average duration of study (10.4 years); GNI per capita ($ 10451). The decline in Kazakhstan's position in the 2012 ranking, despite the progress in the main HDI indices, was largely due to the rapid growth rates of indicators in other countries and the revision of methods for calculating some indicators.

According to the UNDP Report, Kazakhstan in 2014 was also among the countries with the highest HDI level, ranking 56th in the overall ranking. This result showed a significant improvement over the previous year. The republic has risen in the ranking by 14 positions, having improved the average value of the components from 0.757 to 0.788.

The 2015 UN report lists the countries in the world ordered by HDI. The rating covers 188 countries, of which Kazakhstan occupies the 56th position. Compared with the previous year, the HDI of our republic increased by 6 thousandths, from 0.788 to 0.794.

In 2016, Kazakhstan, rising by 4 positions compared with 2013, took 56th place. HDI in our country is equal to 0.788. The indicators are negatively influenced by relatively low life expectancy (primarily among men, which is typical for developing countries), social and economic inequality among the population, environmental problems. Compared to 2015, positive indicators can be traced for some indicators of the index, life expectancy was 69.6 years (in 2015 — 69.4 years), the average number of years, spent on training - 11.7 years (in 2015 — 11.4 years), the GNI per capita reached $ 22093 ($ 20876 in 2015).

In 2017-2018, Kazakhstan ranked 58th in the list of countries in terms of human development. A total of 189 countries were included in the rating. The group of countries with a very high level of human development consisted of 59 states.

Further, the influence of various factors on the HDI is considered using a multifactor correlation-regression model, that allows you to effectively analyze the available data and predict their value for the next period in question. Correlation and regression analysis make it possible to quantify the influence of selected factors on the performance indicator. In addition, knowing the equation of multiple regression and, given certain values of factors, you can predict the value of the function and, therefore, control the analyzed indicator (Table 3, Figure 3).

Table 3. Human Development Index and the factors affecting it

No	Years	Human Development Index (У)	Life expectancy, years (x_1)	Average duration of training, years (x_2)	GNI per capita, population, dollars (x_3)
1	2010	0.714	65.4	10.3	10234
2	2011	0.745	67.0	10.4	10585
3	2012	0.754	67.4	10.4	10451
4	2013	0.757	66.5	10.4	19441
5	2014	0.788	69.4	11.7	20867
6	2015	0.794	69.4	11.4	20876
7	2016	0.788	69,6	11.7	22093
8	2017	0.800	72.4	11.8	22900
9	2018	0.800	70.0	11.8	24230

Note: compiled by the author based on sources:
www.mfa.gov.by/upload/HDR_2013_EN.pdf
https://www.undp.org/content/undp/en/home.html
https://gtmarket.ru/ratings/human-development-index/human-development-index-info
https://gtmarket.ru/ratings/life-expectancy-index/life-expectancy-index-info
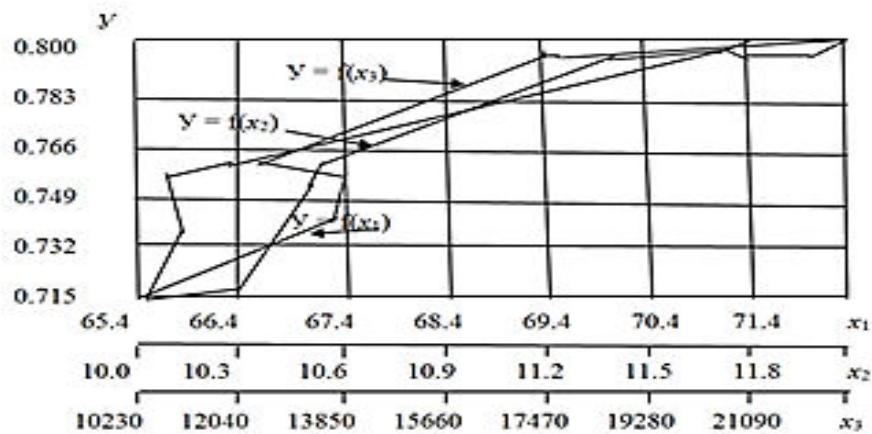
Figure 3. The relationship of the human development index with considered factors

Calculations of regression coefficients and multiple correlation were performed using MS Excel software. The resulting multi-factor regression model is:

$$У = 0.2199 + 0.0064x_1 + 0.0071x_2 + 1.9554x_3; \qquad (19)$$

multiple correlation coefficient R = 0.9549

Assessing the value of the human capital: a Kazakhstan example

As an example, we will assess the value of the human capital of a doctoral PhD O. Yu. Kogut according to the formula (18):

1. In 1996 she graduated from the Kazakh State Academy of Management with a degree in Accounting and Audit, and in 2012 she graduated from a scientific and pedagogical magistracy. Since September 2001 he has been working at KazNU, Al-Farabi senior teacher of the department "Accounting and Auditing". In 2015–2016 She took advanced training courses "Professional accountant RK", and in 2008 she entered the PhD program in the specialty "Accounting and Auditing".

Table 4. Initial data

Years	Tuition, $ undergraduate	magistracy	doctoral studies	refresher courses	rj
1992	131.30				0.650
1993	65.50				1.70
1994	78.11				2.70
1995	136.53				0.450
1996					0.320
1997					0.185
1998					0,250
1999					0,200
2000					0.140
2001					0.110
2002					0.075
2003					0.070
2004					0.070
2005					0.080
2006					0.090
2007					0.090
2008					0.105
2009					0.070
2010		1482.48			0.070
2011		1592.15			0.075
2012					0.055
2013					0.055

2014		0.055
2015	480.06	0.055
2016		0.055
2017		0.103
2018	6989.41	0.090
2019		0.093
Test results 87%		

IHC = [[131.30(1 + 0.65)(1 + 1.70)(1 + 2.70)(1 + 0.450)(1 + 0.320)(1 + 0.185)(1 + 0.250) + 65.50(1 + 1.70)(1 + 2.70)(1 + 0.450)(1 + 0.320)(1 + 0.185)(1 + 0.250) + 78.11(1 + 2.70)(1 + 0.450)(1 + 0.320)(1 + 0.185)(1 + 0.250) + 136.53(1 + 0.450) (1 + 0.320)(1 + 0.185)(1 + 0.250) + (131.3 + 65.50 + 78.11 + 136.53)(1 + 0.200)(1 + 0.140)(1 + 0.110)(1 + 0.075)(1 + 0.070)(1 + 0.070)(1 + 0.080)(1 + 0.090)(1 + 0.090)(1 + 0.105)(1 + 0.070)(1 + 0.070)(1 + 0.075)(1 + 0.055)(1 + 0.055)(1 + 0.055)(1 + 0.055)(1 + 0.055)(1 + 0.103)(1 + 0.090)(1 + 0.093) + 1482.48(1 + 0.070)(1 + 0.075) + 1592.15(1 + 0.055)(1 + 0.055) + 480.06(1 + 0.055) + (1482.48 + 1592.15 + 480.06)(1 + 0.055)(1 + 0.055)(1 + 0.055)(1 + 0.103)(1 + 0.090)(1 + 0.093) + 6989.41(1 + 0.090)(1 + 0.093)] · 0.579 · 87 / 100.

The calculation was made using MS Excel software. Individual human capital O. Yu. Kogut amounted to 19383.7 dollars.

Conclusion

The modern economy places higher demands on the quality of human capital, namely, on the individual's characteristics, knowledge and professional skills, competence and mobility. However, despite the large number of studies investigating human capital and the diversity of approaches to its assessment, in practice there are many unsolved problems in measuring the value of this type of capital. The main difficulty lies in the fact, that some indicators of human capital cannot be directly estimated, for example, there is no direct way to measure either the quantity or the price of human abilities. In addition to the fact, that the calculation of cost values in itself is a very laborious process, the collection, processing and evaluation of the reliability of the necessary information is much more difficult, and this applies to any level of research (macroeconomic, regional, corporate).

One of the estimated indicators of human capital development is the human development index. It is a cumulative indicator of the level of human development in the country, so it is sometimes used as a synonym for such concepts, as "quality of life" or "standard of living".

An analysis of the values of the HDI in Kazakhstan clearly shows, that for the economic development of the state, more attention should be paid to indicators such as the level of education, namely access to education for all segments of the population, as well as a decent standard of living for every citizen.

To assess the value of human capital, it is necessary to use a methodology based on accounting for the costs incurred. The proposed methodology takes into account the initial cost of the human capital of a particular employee and the cost of the knowledge acquired by him as a result of professional development.

Observation and measurement of human capital today is possible only in the management accounting system of the organization. But even here, a conceptual framework for the financial assessment of human capital has not yet been created, which would have been widely used to manage it: there is no unequivocal judgment about the approaches to the financial assessment of human capital, to the disclosure of financial indicators of intellectual and business qualities, labor results.

References

Allaverdyan, V. (2003). *Otsenka stoimosti "kadrovogo potentsiala" predpriyatiya.* CFIN [online]. Available at: http://www.cfin.ru/management/people/value_people.shtml [Accessed 02.03.2020].

Arabyan, K.K. (2010). Otsenka chelovecheskogo kapitala. In *Aktual'nyye problemy razvitiya ekonomiki sovremennogo predprinimatel'stva: Proceedings of All-Russian scientific-practical conference* (pp. 10-19). Moscow.

Becker, G. (1975). *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education.* New York: National Bureau of Economic Research.

Bogatova, A.V. (2013). Metodologicheskiye podkhody k otsenke chelovecheskogo kapitala. *Vestnik Altayskogo gosudarstvennogo agrarnogo universiteta*, 3, 135-139.

Chigoryaev, K.N., Skopintseva, N.A., & Ulischenko, V.V. (2008). Otsenka stoimosti chelovecheskogo kapitala na osnove proizvedonnykh zatrat. *Bulletin of Tomsk Polytechnic University. Georesources Engeneering*, 6, 54-56.

Chitsaz, E., Tajpour, M., Hosseini, E., Khorram, H., & Zorrieh, S. (2019). The Effect of Human and Social Capital on Entrepreneurial Activities: A Case Study of Iran and Implications. *Entrepreneurship and Sustainability Issues*, 6(3), 1193-1203. DOI 10.9770/jesi.2019.6.3(24)

Czerewacz-Filipowicz, K., & Kogut, O.Yu. (2019). Comprehensive methodology for assessing human capital and problems of its assessment. *The Journal of Economic Research & Business Administration*, 1(127), 287-298.

Danilovskikh, T.E., & Avakyan, A.G. (2015). Metodiki otsenki chelovecheskogo kapitala: podkhody k klassifikatsii. *Fundamental Research*, 6-1, 108-111 [online]. Available at: https://www.fundamental-research.ru/ru/article/view?id=38403 [Accessed 04.03.2020].

Díaz-Fernández, M., Pasamar-Reyes, S., & Valle-Cabrera, R. (2017). Human capital and human resource management to achieve ambidextrous learning: A structural perspective. *Business Research Quarterly*, 20, 63-77. DOI 10.1016/j.brq.2016.03.002

Drucker, P. F. (1999). Knowledge-worker productivity: The biggest challenge. *California management review*, 41(2), 79-94. DOI 10.2307/41165987

Fisher, S., Dornbush, R., & Shmalenzi, R. (2002). *Ekonomicheskaya teoriya.* Moscow: Yuniti.

Flamholtz, E. G. (2012). *Human resource accounting: Advances in concepts, methods and applications.* Springer Science & Business Media.

Friedman, M. & von Hayek, F. (2003). *O svobode.* Moscow: Socium.

Gumanitarnaya entsiklopediya: Issledovaniya. (2020). *Indeks chelovecheskogo razvitiya. Tsentr gumanitarnykh tekhnologiy, 2006–2020 (last ed. 22.09.2020)* [online]. Available at: https://gtmarket.ru/ratings/human-development-index [Accessed 23.09.2020].

Henderson, W.D. (2014). Human capital accounting. *Articles by Maurer Faculty,* 2592 [online]. Available at*: http://www.repository.law.indiana.edu/facpub/2592* [Accessed 04.03.2020].

Ilinsky, I.V. (1996). *Investitsii v budushcheye: obrazovaniye v innovatsionnom vosproizvodstve.* Saint Petersburg: Publishing house of SPbUEF.

Ivanova, T.A., Trofimova, V.Sh., Valyaeva, G.G., & Heinonen, V.A. (2016). Ekonomiko-statisticheskoye modelirovaniye stoimosti chelovecheskogo kapitala v RF soglasno podkhodu Kritskogo. *Bulletin of SUSU. Series "Economics and Management"*, 10(2), 47–52. DOI 10.14529/em160206

Ivlieva, N.N. (2005). *Otsenka stoimosti intellektual'nogo kapitala predpriyatiya.* [PhD dissertation, Moscow University of Industry and Finance (MUIF)]. Moscow. Available at: http://economy-lib.com/disser/140392/d?#?page=1 [Accessed 05.03.2020].

Kasayeva, T.V. (2013). Rasshiritel'naya traktovka struktury chelovecheskogo kapitala. *Terra Economicus*, 11(2,-2), 21-27.

Kau, W. (1998). Costs and benefits of vocational education and training at the microeconomic level. *TITLE Vocational Education and Training--The European Research Field. Background Report. Volume I. INSTITUTION European Centre for the Development of Vocational Training*, 195 [online]. Available at: https://www.cedefop.europa.eu/files/RR1_Kau.pdf [Accessed 04.03.2020].

Kendrick, J. (1978). Sovokupnyy kapital SSHA i yego formirovaniye. Moscow: Progress.

Kenton, W. (2019). Human Capital [online]. Available at: https://www.investopedia.com/terms/h/humancapital.asp [Accessed 03.03.2020].

Kogut, O.Yu., Janshanlo, R. Es., & Czerewacz-Filipowicz, K. (2019). Human capital accounting issues in the digital economy. In *Digital Transformation of the Economy: Challenges, Trends and New Opportunities* (pp. 296-305). Springer, Cham. DOI 10.1007/978-3-030-11367-4_29

Leddy, C. (2018). *The Value of Human Capital: Measuring Your Most Important Assets.* Spark [online]. Available at: https://www.adp.com/spark/articles/2018/10/the-value-of-human-capital-measuring-your-most-important-assets.aspx [Accessed 02.03.2020].

Lisenkova, K.S. (2010). Otsenka effektivnosti investitsiy v chelovecheskiy kapital kompanii. *Aktual'nyye problemy ekonomiki i prava*, 1(13), 53-58.

Machlup, F. (1966). Proizvodstvo i rasprostraneniye znaniy v SSHA. Moscow: Progress.

Marshall, A. (1993). *Principles of economic science*. Moscow: Progress.

Marx, K. & Engels, F. (1961). *Sochineniya.* 2nd Ed, Vol. 24. Moscow: Politizdat.

McConnell, C.R., & Bru, L.S. (1993). *Ekonomika: in 2 volumes.* Vol. 2. Moscow: Yuniti.

Miller, S. (2017). *Health Premiums Expected to Rise 5.5% in 2018, Driving Cost Management Steps.* SHRM [online]. Available at: https://www.shrm.org/resourcesandtools/hr-topics/benefits/pages/employers-benefits-costs-rise.aspx [Accessed 02.03.2020].

Möller, K., Gamerschlag, R., & Guenther, F. (2011). Determinants and effects of human capital reporting and controlling. *Journal of Management Control*, 22(3), 311-333. DOI 10.1007/s00187-011-0138-3

Morse, W. (1973). A Note on the Relationship between Human Assets and Human Capital. *The Accounting Review*, 48(3), 589-593.

Nagyova, A., & Pacaiova, H. (2018). Maintenance evaluation based on the EFQM model excellence. *IOP Conference series: Materials Science and Engineering*, 393(1), 012005.

Nesterov, A.K. (2017). *Otsenka chelovecheskogo kapitala.* Encyclopedia of Nesterovs' [online]. Available at: http://odiplom.ru/lab/ocenka-chelovecheskogo-kapitala.html [Accessed 02.03.2020].

Nickolas S. (2019). *What is the Relationship between Human Capital and Economic Growth?* Investopedia [online]. Available at: https://www.investopedia.com/ask/answers/032415/what-relationship-between-human-capital-and-economic-growth.asp [Accessed 04.03.2020].

Noskova, K.A. (2013). Otsenka chelovecheskogo kapitala i-go sotrudnika organizatsii. In *Aktual'nyye voprosy ekonomicheskikh nauk – Proceedings of the Second International Scientific Conference* (pp. 4-8). Ufa.

Oksinoyd, K. E., & Rozina, E.V. (2014). *Upravleniye personalom: teoriya i praktika. Upravleniye sotsial'nym razvitiyem i sotsial'naya rabota s personalom organizatsii.* Moscow: Prospect.

Oshchepkova, D.S. (2016). K voprosu ob otsenke chelovecheskogo kapitala. *Bulletin of Tomsk State University. Economy*, 2(34), 88-97.

Perepelkin, V.A., Perepelkina, E.V., & Morozova, E.S. (2016). Evolution of the Concept of "Human Capital" in Economic Science. *International Journal of Environmental & Science Education*, 11(15), 7649-7658 [online]. Available at: http://www.ijese.net/makale_indir/IJESE_1054_article_57f21891be0e5.pdf [Accessed 02.03.2020].

Petty, W. (1940). *Ekonomicheskiye i statisticheskiye trudy.* Moscow: State Socio-Economic Publishing House.

Podberezkin, A.I. (2012). *Natsional'nyy chelovecheskiy kapital. Vol. 1: Rol' ideologii v modernizatsii Rossii.* Moscow: MGIMO University.

Riccardini, F. (2015). Towards Satellite Accounts on Education and Human Capital in OECD Countries. In Maggino, F. (Ed.). *A New Research Agenda for Improvements in Quality of Life. Social Indicators Research* Series, 57 (pp. 205-230). Springer, Cham.

Sasongko, G., Huruta, A.D., & Pirzada, K. (2019). Why labor force participation rate rises? New empirical evidence from Indonesia. *Entrepreneurship and Sustainability Issues*, 7(1), 166-176. DOI 10.9770/jesi.2019.7.1(13)

Schultz, T. (1980). *Investment in People. The Economics of Population Quality*. London: University of California press.

Sirazieva, A.R. (2015). Chelovecheskiy kapital: problemy otrazheniya v uchete i otchetnosti. *Vestnik nauki i obrazovaniya*, 3, 97-99 [online]. Available at: https://cyberleninka.ru/article/n/chelovecheskiy-kapital-problemy-otrazheniya-v-uchete-i-otchetnosti/viewer [Accessed 29.02.2020].

Tsarev, V.V., & Evstratov, A.Yu. (2008). Otsenka individual'noy stoimosti rabotnika kommercheskogo predpriyatiya. *Upravleniye personalom*, 24, 34-39.

UNDP. (2019). *Human Development Report 2019* [online]. Available at: http://hdr.undp.org/en/2019-report [Accessed 05.03.2020].

United Nations. (2010). *Doklad o razvitii cheloveka. Real'noye bogatstvo narodov: puti k razvitiyu cheloveka* [online]. Available at: www.un.org/ru/development/hdr/2010/hdr_2010_complete.pdf [Accessed 23.11.2019].

Worldometer. (2020). *Life Expectancy of the World Population* [online]. Available at: https://www.worldometers.info/demographics/life-expectancy/ [Accessed 01.03.2020].

Xingqiang, D., Jingwei, Y., & Fei, H. (2018). Auditor human capital and financial misstatement: Evidence from China. *China Journal of Accounting Research*, 11(4), 279-305. DOI 10.1016/j.cjar.2018.06.001

Yakunina, R.P., & Bychkov, G.A. (2015). Correlation Analysis of the Components of the Human Development Index Across Countries. *Procedia Economics and Finance*, 24, 766-771. DOI 10.1016/S2212-5671(15)00692-9