G. Dinzhanova

University of International Business, Almaty, Kazakhstan

dinzhanovagulbakhyt@gmail.com

https://orcid.org/0000-0002-4964-2747

A measure of human development

Abstract

Object: The paper aims to define the appropriate approach to measuring human development in Kazakhstan. A new approach to human capital measurement is proposed.

Methods: We used statistical data analysis, index calculation method, method of UNDP, and method of correlation and regression analysis. The sample mean method is used in the calculation of average national test results.

Results: Results indicate the level of human development in the regions of Kazakhstan, including the level of health, education and life. Also, we have discovered the interrelation of human capital and the average income of the population.

Conclusion: This article investigates the components of human capital development index, the computing of human development within Kazakhstan and its regions, relationship of the human development to income. The effect of income on HDI is explained in the article. The human capital index in Kazakhstan is high, however, in 6 regions it is average.

Keywords: human capital development index, human capital, methodology of HDI, level of education in Kazakstan, theory of human capital.

Introduction

The theory of human capital, which has an impact on educational and social sciences, is the most controversial and complex in economic theory. The concept of human capital appeared in the XVII century by measuring human value to assess the wealth of a nation (Petty, 1899). So, A. Smith (2020), W. Petty, D. Ricardo (Stigler, 1958) made the basis of the concept "Human capital". However, human capital theory became popular only in the 50s of the XX century. Human capital is a non-renewable resource (Becker, 1964). Humans are not only an aim but a resource in social and economical development. The human factor is becoming more important as an object of investment than fixed assets and technologies (Sagadiev, 2012). Therefore, countries are interested in developing human resources to get a labour force to implement low skilled and high skilled jobs.

As President K.Zh. Tokayev (2020) pointed out in the message to the people: "Firstly, it is necessary to increase assets of the population by creating workplaces and providing fair wages. However, it is impossible without the rising quality of human capital". Within midterm Strategic plan 2025 of the Republic of Kazakhstan (2018) mentioned that national human capital is a key factor of development in the XXI century.

There are many definitions of the term "human capital". We propose the following interpretation of the term: "human capital is a set of high quality skills and abilities of people who can make an economic contribution to the development of the country".

In a market economy, a quick return on investment is possible in the long term if many countries provide a strong link between physical and human capital. Consequently, sustainable development depends on a person's standard of living or quality of life. One of these aggregate indicators for assessing the standard of living of a person is the human development index (HDI). The human development index is an aggregate indicator calculated to measure the standard of living, literacy, education, and longevity (UNDP, 2019).

Kazakhstan's healthcare expenditures in 2019 amounted to 4.5 trillion tenge, i.e., 6.47 % of GDP (Statistics Kazakhstan, 2020). In developed countries this indicator is significantly higher, for instance, the United States (17.06 %, 2017), Germany (11.25 %, 2017), and Canada (10.57 %, 2017) (Worldbank statistics, 2020). Conversely, the cost of education in 2019 amounted to 2.33 trillion tenge (Statistics Kazakhstan, 2020), which is half of the amount spent on healthcare. In developed countries, such as the USA (4.99 %, 2014), Germany (4.93 %-2014), Canada (5.27 %, 2011), this indicator is higher (Our world in data, 2020).

Secondary statistics of Kazakhstan were required that would allow to fully show the picture of the current situation in the country to calculate the human development index. Since some statistical data is not available, we have modified the methodology for calculating the level of human development. The aim of the research is to define the human development level in the regions of Kazakhstan and propose recommendations to the sustainable development of human capital. There are two hypotheses: 1) human development index in the regions will be lower than in the megapolises as Almaty, Nur-Sultan, and Shymkent; 2) human development and income of strongly correlated and linked.

This article consists of three main sections. The first section will cover the components of the human development index. The second section will present the author's methodology for calculating human development in Kazakhstan. In the third section, we will look at the relationship between the human development index and the income of the population.

Literature Review

The first attempts to quantify human capital began to be accepted from the beginning of the XX century. Economists tried to calculate the cost of human capital, the impact of education on economic growth, and government spending on education and the upbringing of the population using economic, mathematical, and statistical research methods. Fischer (1906), Forsyth (1914), Dublin (1930) made a great contribution to these studies. Forsyth investigated the cost of human capital based on financial losses. He considered financial losses as a result of average life expectancy, life expectancy, and age-related mortality rates. Dublin and Lotka (1930) published the work "The Monetary value of a person", in which they estimated the age and annual earnings of a person until the end of life by subtracting the amount of living expenses. Ashton & Green (1996) insisted that measurement of human capital should be considered within a social and political context, and between human capital should correlate with economic performance.

Three approaches in human capital measurement, output-based approach, coast-based approach, and income-based approach, are common among researchers and will be considered.

There is the output-based approach where school enrollment rates, accumulated years of schooling the ratio between skilled-adults and total adults the average years of schooling are considered to measure the stock of human capital.

Ilynskyi considered human capital as a combination of education, health, and culture. By culture he means the stereotypes of behaviour in the framework of traditions, general culture, and social interaction, while experience and professional skills are included in education (Petkova, 2020).

Seryabrakova, Volkova, and Volkova (2019) considered integral method of human capital evaluation, which includes demographic factor, labour and educational factor, research, and sociocultural factors.

Baldissera and Cornali (2020) analyzed human capital in the regions of Italy comparing educational attainment, assessment of adult competencies, and literacy. They have determined that being young, well-educated and with a high professional position predicts a high level of proficiency. Also, geographical variance incompetence of human capital is possible due to the local education.

The cost-based approach is based on the calculation of human capital by invested costs for individuals' human capital. So, the method based on all expenditures on human capital formation and accumulation, including, households and education. Depreciation and discounted income in the future are used to calculate the invested cost. Kendrick (1976), Eisner (1985, 1988, 1989) calculated human capital by twofold calculation of student expenses as time expenditure during study, tuition fee, education materials and government expenses as salaries and investment into universities and institutions.

However, according to Kiker (1966) and Le (2003), human capital should be determined by demand and supply, that's why it contradicts the conceptual ground of human capital value. Also, identifying expenditures between investment and consumption is complicated (Liu & Fraumeni, 2016).

Cost-based approach is used in the calculation of human capital in Germany (Ewerhart, 2001), the Netherlands (Rooijen-Horsten et al., 2008), and Finland (Kokkinen, 2008, 2010).

The income-based approach is based on the returns that an individual obtains from a labour market through education investment (Dae-bong, 2009, p.6). This approach helps to assess a person's earning power to see human capital price in the market, while the labour market takes into account other factors such as ability, effort, productivity and education, as well as the institutional and technological structures of the economy (Dagum & Slottje, 2000). This method also allows to evaluate the future productive capacities economy (Graham and Webb, 1979).

Meanwhile, scientists discovered the drawbacks of the method. De Foville (1905) and Eisner (1988) argued that maintenance costs don't deduct from gross earning and may lead to overestimation of human capital. Weisbrod (1961) discovered that it is difficult to differentiate the maintenance costs from public goods.

According to the research "Measuring Human Capital: Alternative Methods and International Evidence" (Oxley, Le & Gibson, 2008), the income-based method's drawback is lack of availability of data on earnings in countries such as Kazakhstan. Wages data in many developing counties are not available or not reliable. Oxley, Le, and Gibson argue that income-based measures of human capital will be biased because of the reasons in the different wages range which does not always depends on productivity.

According to Krueger and Lindahl (2001), human capital is not measured enough because of the mixed evidence. The traditional approaches of measuring human capital have the following disadvantages as incomplete indicators, interconnection of economy and human capital is not taking into account.

Methods

There are various methodologies for calculating the human development index (UNDP, WorldBank, ILO). As a basis of measurement human development index of UNDP is used. The calculations are mainly based on the health index, the education level index, and the standard of living index. The structure of the education index has modified, we use governmental statistics for 2019. Also, the relationship of human development index to income is considered in regression.

Quantitative method used in order to evaluate the dependence of the human development index on the population's income. Statistical data is studied in a period from 1993 to 2019. At the specification stage, a paired linear regression and correlation were selected. Its parameters are estimated using the least-squares method.

Results

The concepts of maximum and minimum are used as tools for transforming indicators into an index from 0 to 1. The minimum values are the natural zero, and the maximum values are the desired norm.

Table 1. The components of human development index

Measurement	Indicator	Actual value of Kazakhstan	Minimum	Maximum
Health	Life expectancy (years)	73.18	20	85
Education	Net primary school enrolment rate (children aged 7–10 years)	99.6	0	100
	Gross enrolment ratio in secondary education	104.6	0	100
	Gross enrolment in higher education	54.29	0	100
	Average point of National test	65.5	0	140
Standard of living	GDP per capita	9812.5	100	75 000
Note: modified by author based on UNDP technical notes (2019)				

$$\text{Dimension index} = \frac{\text{Actual value} - \min}{\text{Max} - \min} \qquad (1)$$

The health index will be calculated based on the life expectancy of the country's citizens. Life expectancy is a statistical measure of a person's average lifetime. The maximum indicator is the age of expected death of a person. For this measurement, we use the age of 80 years. The natural zero life expectancy is 20 years. People's life was minimum 20 even in the medieval period (Human development report technical notes, p.2).

$$\text{Health index} = \frac{73.18 - 20}{85 - 20} = 0{,}818 \ (1)$$

The education index is calculated taking into account that the required length of education and the average length of training are replaced by the net primary education coverage rate (children aged 7–10 years), the gross secondary education coverage rate, and the gross higher education coverage rate.

$$\text{The index of the enrolment ratio in primary education} = \frac{99.6 - 0}{100 - 0} = 0.996 \ (2)$$

$$\text{The index of the enrolment ratio in secondary education} = \frac{104.6 - 0}{100 - 0} = 1.046 \ (2)$$

$$\text{The index of the enrolment ratio in higher education} = \frac{54.29 - 0}{100 - 0} = 0.5429 \ (2)$$

Education coverage index $=\frac{0.996+1.046+0.5429}{3} = 0.861$ (3)

At the moment there is a theory (Frumin, 2018) about the need to calculate the education index not in terms of coverage but in terms of the quality of education, where a large role is given to cognitive and analytical skills of a person. For this data the World Bank uses the results of the PISA exam among 15-year-old citizens of the country but taking into account that the exam is conducted entirely in English, it is impossible to judge the level of education in general since the level of English language proficiency is still low. Therefore we will use the results of National Test (NT) for 2019 for the calculation.

NT index $=\frac{65,5-0}{140-0} = 0,468$ (4)

Education index$= \frac{education\ coverage\ index + NT\ index}{2} = \frac{0.861+0.468}{2} = 0,6645$ (5)

In the index of living standards in this calculation we will replace GNI per capita with GDP due to the lack of statistical data in Kazakhstan.

The income index $=\frac{\ln 9812.5 - \ln 100}{\ln 75000 - \ln 100} = 0.692$ (5)

$HDI = \frac{education\ index + health\ index + income\ index}{3} = \frac{0.6645+0.818+0.692}{3} = 0.724$ (6)

According to UNDP (2019) classification, Kazakhstan is a country with a high human development index.

Using the same methodology we have computed HDI in the regions of Kazakhstan (figure 1).
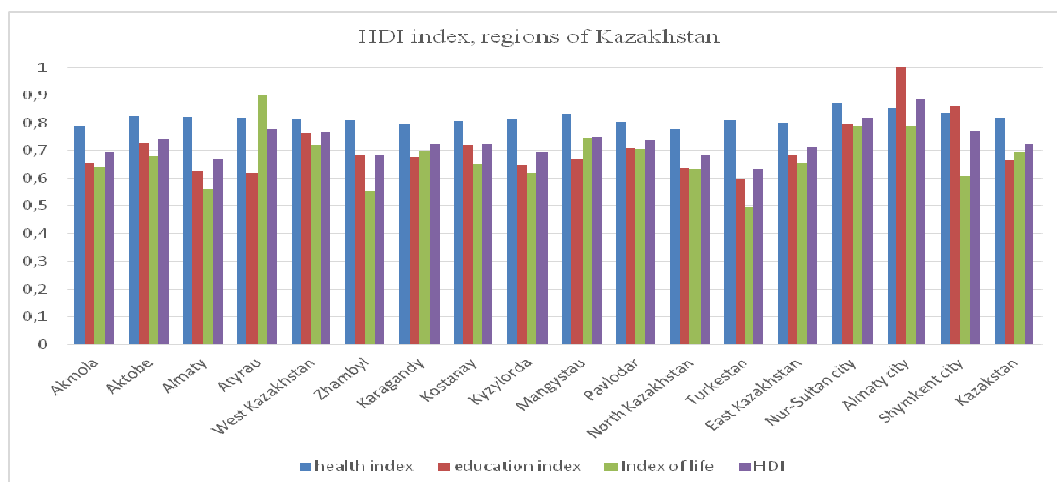

Figure 1. Human development index in the regions of Kazakhstan

Note: compiled by author

Figure 1 shows that the human capacity in the cities Almaty and Nur-Sultan is 0.89 and 0.82 respectively, which is very high. In Akmola region, Almaty region, Zhambyl region, Kyzylorda region, North Kazakhstan region, and Turkestan region human capacity is average, while in the rest of the regions human development index is high. It is important to notice that education and life level in Turkistan region is low in comparison with average indicators in the country.

Relationship of the human development index to income

Quantitative method used in order to evaluate the dependence of the human development index on the population's income. Statistical data is studied in a period from 1993 to 2019. At the specification stage a paired linear regression and correlation were selected. The regression parameters are estimated using the least-squares method. The correlation of human capital index and income are strong which is 0,88.

An economic interpretation of the model parameters is possible: an increase in the human development index by 1 unit leads to an increase in income by an average of 0.00021 units (Figure 2).
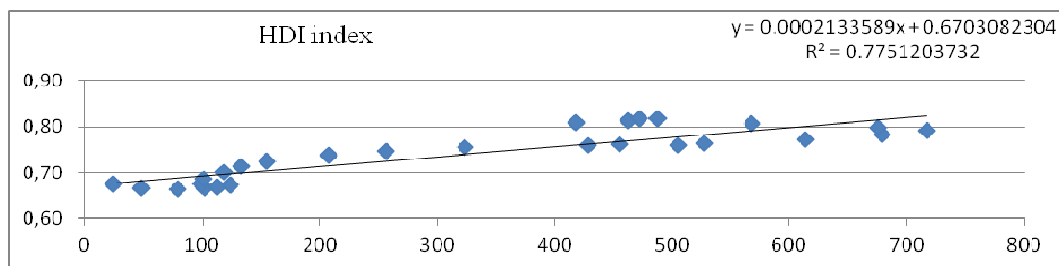
Figure 2. HDI index and income interrelation

Note: compiled by author

Table 2. Regression statistics

Multiple R	0.880409
R-square	0.77512
Normalized R-square	0.766125
Standard error	0.026321
Observations	27
Note: compiled by author	

The HDI change depends on the population's income by 77 %, while other factors that are not accounted for in the model account for 23 % of the HDI change. If the coefficient of determination is 0.77, then the HDI change is 77 % of the population's income, and the share of other factors not accounted for in the model remains 23 % of the HDI change (table 2).

Table 3. Analysis of variance

	df	SS	MS	F	Significance of F
Regression	1	0.059699	0.059699	86.17059	1.41E-09
Remains	25	0.01732	0.000693	-	-
Subtotal	26	0.077019	-	-	-
Note: compiled by author					

Table 4. Linear Regression Model Findings

0	The coefficients	Standard error	t-statistics	p-value	Lower 95 %	Top 95 %	Lower 95.0 %	Upper 95.0 %
Y-intersection	0.670308	0.00911	73.5821	9.54E-31	0.6515	0.68907	0.65154	0.68907
Average monthly nominal salary per employee	0,000213	2,3E-05	9,282811	1.41E-09	0.0002	0.00026	0.00016	0.00026
Note: compiled by author								

According to Tables 3, 4, the resulting linear regression model is proved this model statistically significant.

Discussion and conclusion

According to the literature review, human capital calculation has complicated and complex computing, i.e., it has incomplete indicators in income, productivity, and education. The methods in use have their advantages and drawbacks, therefore we considered a modified human development index to measure human capital in the regions of Kazakhstan.

First, we have considered the components of the human development index. The indicators of the education index were modified by adding quality factor. It allows to fulfil the knowledge of the current state of education and human capital in Kazakhstan.

Secondly, the author's methodology for calculating human development in Kazakhstan is presented. According to calculations, Kazakhstan is a country with a high human development index. The human capacity in the cities Almaty and Nur-Sultan is very high, 0.89 and 0.82 respectively, while in Shymkent (0,769) this indicator is nearly the same as Atyrau (0,779) and West Kazakhstan (0,766) regions. In Akmola region, Almaty region, Zhambyl region, Kyzylorda region, North Kazakhstan region, and Turkestan region human capacity is average, while in the rest of the regions human development index is high. The state should take measures to improve these indicators by investing in education. Therefore, the hypothesis that Almaty, Nur-Sultan, and Shymkent have a high human development index is rejected. Moreover, one more computation of the reasons for low human development index in some regions should be defined in future research.

Third, the dependence of the human development index on the population's income was studied. An economic interpretation of the model parameters is possible: an increase in income by 1 unit of change leads to an increase in HDI by an average of 0.00021 units of change. Income and human development index are strongly linked, human development affects income, which, in turn, reflects on the economic growth of the country, therefore investing in human capital is necessary. The hypothesis is proved.

References

Ashton, D. &Francis, G. (1996). *Education, Training and the Global Economy.* Cheltenham, UK: Edward Elgar. http://dx.doi.org/10.14507/er.v0.31

Baldissera, A., & Cornali, F. (2020). *Geography of human capital in Italy: a comparison between macro-regions. Modern Italy, 1–17.* doi:10.1017/mit.2020.25

Becker, G.S. (1964). *Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education.* 3rd Edition, The University of Chicago Press, Chicago.

Current health expenditure (% of GDP). (n.d). Retrieved from 4/10/2020 https://data.worldbank.org/indicator/SH.XPD.CHEX.GD.ZS

Dae-bong, K. (2009). Human Capital and its Measurement, the 3rd OECD World Forum on "Statistics, Knowledge and Policy", Charting progress, Building Visions, Improving life, Busan Korea 27–30 October. Retrieved from http://www.oecd.worldforum.org

Dagum, C. & Slottje, D.J. (2000). A new method to estimate the level and distribution of household human capital with application. Structural Change and Economic Dynamics, 11(2):67–94.

De Foville, A. (1905). Ce que c'est la richesse d'un peuple. Bulletin de l'Institut International de Statistique, 14(3):62–74. Cited in Kiker (1966).

Dublin, L. I.& Lotka, A. (1930) The Money Value of Man. New York: Ronald Press Co.

Eisner, R. (1985). The Total Income System of Accounts. Survey of Current Business, vol. 65, pp. 24–48.

Eisner, R. (1988). Extended Accounts for National Income and Product. *Journal of Economic Literature*. Vol. 26, pp. 1611–1684.

Eisner, R. (1989). The Total Incomes System ofAccounts. Chicago: University of Chicago Press.

Ewerhart, G. (2001). Humankapital in Deutschland. Bildungsinvestitionen, Bildungsvermögen und Abschreibungen auf Bildung. Bielefeld. ISBN: 978-3-7639-3935-0

Fisher, I. (1906). Nature of capital and income. New York. Macmillan.

Forsyth, C.H. (1914–15). Vital and Monetary Losses in the United States Due to Preventable Deaths. American Statis. Assoc. Publication, XIV 758–89.

Frumin, I. (2018). Chelovecheskii kapital 2.0, Retrieved November 28, 2020, from https://www.youtube.com/watch?v=e6K5sPkee8I&ab_channel=2035university [in Russian].

Graham, J.W. and Webb, R.H. (1979). Stocks and depreciation of human capital: New evidence from a present-value perspective. Review of Income and Wealth, 25(2), p.209–224.

Kiker, B.F. (1966). The historical roots of the concept of human capital. Journal of Political Economy, 74(5), p. 481–499.

Kendrick, J. (1976), The Formation and Stocks of Total Capital, New York, Columbia University Press for NBER.

Kokkinen, A. (2008). Human Capital and Finland's Economic Growth in 1910–2000 — Assessing Human Capital Accumulation by Education inside the National Accounts Framework. The 30th General Conference of the International Association for Research in Income and Wealth, Poster Session I: National Accounts Issues. Portoroz, Slovenia.

Kokkinen, A. (2010). Assessing Human Capital in the National Accounts — Is there a Feedback to Theory. The 31st General Conference of the International Association for Research in Income and Wealth (IARIW), Session 8C. St. Gallen, Switzerland.

Krueger, A.B. & Lindahl, M. (2001). Education for growth: Why and for whom? *Journal of Economic Literature*, 39(4), p.1101–1136.

Le, T.V.T., Gibson, J., & Oxley, L. (2003). Cost- and income-based measures of human capital. *Journal of Economic Surveys*. 17(3), p.271–307.

Liu, G., & Fraumeni, B. (2016). Measuring human capital: Country experiences and international initiatives. In D. Jorgenson, K. Fukao, & M. Timmer (Eds.), *The World Economy: Growth or Stagnation?* p. 429–468) Cambridge: Cambridge University Press. doi:10.1017/9781316534502.012

Oxxley L., Le, T., Gibsonm J. (2008). Measuring Human Capital: Alternative Methods and International Evidence. *Korean Economic Review*. Korean Economic Association, vol. 24, p. 283–344.

Petkova, T.A. (2020). Chelovecheskii kapital kak osnovnoi faktor innovacionnogo razvitiya predpriyatii // Vestnik Chelyabinskogo gosudarstvennogo universiteta. Ekonomicheskie nauki, 6 (440), 69, 218–224. DOI 10.47475/1994–2796–2020–10626 [in Russian].

Petty, W., Graunt, J., & Hull, C.H. (1899). *The economic writings of Sir William Petty*. Cambridge: University Press.

President of Kazakhstan Kassym-Jomart Tokayev's State of the Nation Address, September 1, 2020 // https://www.akorda.kz/ru/addresses/addresses_of_president/poslanie-glavy-gosudarstva-kasym-zhomarta-tokaeva-narodu-kazahstana-1-sentyabrya-2020-g

Rooijen-Horsten, M van, D. van den Bergen, M. de Haan, A. Klinkers and M. Tanriseven (2008). Intangible capital in the Netherlands: Measurement and contribution to economic growth. Statistics Netherlands. The Hague/Heerlen.

Sagadiev, K.A. (2012). Rol' chelovecheskogo kapitala v innovacionnom razvitii Kazahstana. Mezhdunarodnyj forum "Pervye Nazarbaevskie chtenija", "Novyj Kazahstan v novom mire", Ministerstvo obrazovanija i nauki RK i GU Nazarbaev centr, Astana, 28–29, November, 2012 [in Russian].

Serebryakova, N.A., Volkova, S.A., & Volkova, T.A. (2019). Metodika integralnoy otsenki chelovecheskogo kapitala regiona. *Proceedings of the Voronezh State University of Engineering Technologies*, 81(3), p.375–380. https://doi.org/10.20914/2310–1202–2019–3–375–380 [in Russian].

Smith, A. (2020). *The wealth of nations*. NewYork: VintageBooks.

Statisticheskie dannye ENT. (n.d.). Raspredelenie vypusknikov shkol tekushhego goda po nabrannym ballam po rezul'tatam ENT v razrezeoblastej (vypuskniki gorodskih shkol). Retrieved November 28, 2020, from https://testcenter.kz/ru/stats/statisticheskie-dannye-ent/? PAGEN_1=2 [in Russian].

Statisticheskie dannye ENT. (n.d.) Raspredelenie vypusknikov shkolte kushchegogoda po nabrannym ballam po rezul'tatam ENT v razreze oblastej (vypuskniki sel'skih shkol). Retrieved November 28, 2020, from https://testcenter.kz/ru/stats/statisticheskie-dannye-ent/? PAGEN_1=2 [in Russian].

Statistika obrazovanija (n.d) chistyj kojefficient okhvata nachal'nym obrazovaniem (deti v vozraste 7–10 let). Retrieved November 28, 2020, from https://stat.gov.kz/official/industry/62/statistic/7 [in Russian].

Statistika obrazovanija. (n.d). Valovyj kojefficient okhvata srednim obrazovaniem (deti v vozraste 7–10 let). Retrieved November 28, 2020, from https://stat.gov.kz/official/industry/62/statistic/7 [in Russian].

Statistika obrazovanija. (n.d). Kojefficient valovogo okhvata vysshim obrazovaniem (deti v vozraste 7–10 let) .Retrieved November 28, 2020, from https://stat.gov.kz/official/industry/62/statistic/7 [in Russian].

Stigler, J.G. (1958). Riccardo and the 93 % labour theory of value. *The American Economic Review*, 48

Strategicheskij plan 2025. (Decree of the President of the Republic of Kazakhstan #636 dated on 15 February, 2018). Retrieved from https://primeminister.kz/ru/documents/gosprograms/stratplan-2025

The dynamics of main indicators. (2020). Statistical data of Kazakhstan. Retrived from 4/10/2020 www.stat.gov.kz

Total government expenditure on education. (n.d.). Retrieved November 28, 2020, from https://ourworldindata.org/grapher/total-government-expenditure-on-education-gdp? tab=table

UNDP. (2019). Human Development Report 2019. Beyond income, beyond averages, beyond today: Inequalities in human development in the 21st century. New York. http://hdr.undp.org/en/content/human-development-report-2019

Weisbrod, B.A. (1961). The valuation of human capital. *Journal of Political Economy*. 69(5), p. 425– 436.

Г. Динжанова

Адам дамуының өлшемі

Аңдатпа

Мақсаты: Мақала Қазақстандағы адами дамуды өлшеудің сәйкес тәсілдерін анықтауға бағытталған. Адам капиталын өлшеудің жаңа тәсілі ұсынылған.

Әдісі: Мақалада статистикалық деректерді талдау, индекстерді есептеу әдісі, БҰҰДБ әдісі және регрессия әдісі қолданылған. Ұлттық тестілеудің орташа нәтижелерін есептеу кезінде орташа үлгі әдісі пайдаланылған.

Қорытынды: Жұмыстың нәтижесінде денсаулық сақтау, білім және өмір деңгейін қоса алғанда, Қазақстан аймақтарындағы адамның даму деңгейі көрсетілген. Сонымен қатар, адам капиталы мен халықтың орташа табысының өзара байланысы анықталған.

Тұжырымдама: Осы мақалада адами капиталды дамыту индексінің компоненттері, Қазақстандағы және оның аймақтарындағы адами дамуды есептеу, адам дамуының табысқа қатынасы зерттелген. Қазақстандағы адами капиталдың индексі жоғары, алайда көрсеткіштердің ішінде бұл индекс республиканың 6 аймағында орташа.

Кілт сөздер: адами капиталды дамыту индексі, адам капиталы, АДИ әдістемесі, Қазақстандағы білім деңгейі, адами капитал теориясы.

Г. Динжанова

Измерения человеческого развития

Аннотация

Цель: Целью данной статьи является выявление подходящего подхода в измерении человеческого развития (ИЧР) в Казахстане. Автором предложен новый подход к измерению человеческого капитала.

Методы: В статье использованы статистический анализ данных, методы расчета индекса, ПРООН и регрессионного анализа. Метод выборочного среднего используется для расчета средних результатов единого национального тестирования.

Результаты: В результатах работы отражен уровень человеческого развития в Казахстане и его регионах, включая уровни здоровья, образования и жизни. Также рассмотрена взаимосвязь между человеческим развитием и доходами населения.

Заключение: В статье изучены компоненты индекса развития человеческого капитала, расчет человеческого развития в Казахстане и его регионах. Кроме того, объясняется влияние дохода на ИЧР в регрессионной модели. Индекс человеческого капитала в Казахстане высокий, однако в 6 регионах он ниже средних показателей республики.

Ключевые слова: индекс развития человеческого капитала, человеческий капитал, методология ИЧР, уровень образования в Казахстане, теория человеческого капитала.

References

Ashton, D., Francis, G. Education, Training and the Global Economy [Текст] / D. Ashton, G. Francis. — Cheltenham, UK: Edward Elgar, 1996 http://dx.doi.org/10.14507/er.v0.31

Baldissera, A., & Cornali, F. Geography of human capital in Italy: a comparison between macro-regions [Текст] / Baldissera, A., & Cornali, F. — Modern Italy, 1–17, 2020. doi:10.1017/mit.2020.25

Becker, G.S. Human Capital: A Theoreticaland Empirical Analysis with Special Reference to Education. 3rd Edition [Текст] / G.S. Becker. — Chicago: The University of Chicago Press, 1964.

Chelovecheskii kapital 2.0 [Видео] / Frumin, I., 2018. Retrieved November 28, 2020, from https://www.youtube.com/watch? v=e6K5sPkee8I&ab_channel=2035university

Current health expenditure (% of GDP) // Retrived from 4/10/2020 https://data.worldbank.org/indicator/SH.XPD.CHEX.GD.ZS

Dae-bong, K. Human Capital and its Measurement [Текст] / Dae-bong, K. // the 3rd OECD World Forum on "Statistics, Knowledge and Policy", Charting progress, Building Visions, Improving life, Busan Korea 27 — 30 2009. October. Retrieved from http://www.oecd.worldforum.org

Dagum, C., Slottje, D.J. A new method to estimate the level and distribution of household human capital with application. [Текст] / Dagum, C., Slottje, D. J. // Structural Change and Economic Dynamics, 2000, 11(2):67–94.

De Foville, A. Ce que c'est la richesse d'un peuple. [Текст]/ De Foville, A. // Bulletin de l'Institut International de Statistique, 1905, 14(3):62–74. Cited in Kiker (1966)

Dublin, L. I., Lotka, A. The Money Value of Man[Текст] / Dublin, L. I., Lotka, A. — New York: Ronald Press Co., 1930.

Eisner, R. The Total Income System of Accounts [Текст] / Eisner, R. //Survey of Current Business, 1985, vol. 65, pp. 24–48.

Eisner, R. Extended Accounts for National Income and Product[Текст]/ Eisner, R. // Journal of Economic Literature, 1988, vol. 26, pp. 1611–1684.

Eisner, R. The Total Incomes System ofAccounts [Текст] / Eisner, R. — Chicago: University of Chicago Press, 1989.

Ewerhart, G. Humankapital in Deutschland. Bildungsinvestitionen, Bildungsvermögen und Abschreibungen auf Bildung. [Текст] / Ewerhart, G. — Bielefeld, 2001 ISBN: 978–3–7639–3935–0

Fisher, I. Nature of capital and income[Текст]/ Fisher, I. — New York: Macmillan, 1906.

Forsyth, C.H. Vital and Monetary Losses in the United States Due to Preventable Deaths [Текст] / Forsyth,C.H. — American Statis. Assoc. Publication, XIV 758–89,1914–15.

Graham, J. W. and Webb, R.H. Stocks and depreciation of human capital: New evidence from a present-value perspective [Текст]/ Graham, J. W. and Webb, R. H.// Review of Income and Wealth, 1979, 25(2): 209–224.

Kiker, B.F. The historical roots of the concept of human capital[Текст]/ Kiker, B. F. // Journal of Political Economy, 1966, 74(5). p.481–499.

Kendrick, J. The Formation and Stocks of Total Capital[Текст]/ Kendrick, J. — New York, Columbia University Press for NBER, 1976.

Kokkinen, A. Human Capital and Finland's Economic Growth in 1910–2000 — Assessing Human Capital Accumulation by Education inside the National Accounts Framework[Текст]/ Kokkinen, A. // The 30th General Conference of the International Association for Research in Income and Wealth, Poster Session I: National Accounts Issues. Portoroz, Slovenia, 2008.

Kokkinen, A. Assessing Human Capital in the National Accounts — Is there a Feedback to Theory. [Текст] / Kokkinen, A. // The 31st General Conference of the International Association for Research in Income and Wealth (IARIW), Session 8C. St. Gallen, Switzerland, 2010.

Krueger, A. B., Lindahl, M. Education for growth: Why and for whom? [Текст]/ Krueger, A. B., Lindahl, M.// Journal of Economic Literature, 2001, 39(4):1101–1136.

Le, T. V. T., Gibson, J., Oxley, L. Cost- and income-based measures of human capital [Текст]/ Le, T.V.T., Gibson, J., Oxley, L.// Journal of Economic Surveys, 2003, 17(3), p.271–307.

Liu, G., & Fraumeni, B. Measuring human capital: Country experiences and international initiatives / Liu, G., & Fraumeni, B., edited by D. Jorgenson, K. Fukao, & M. Timmer //The World Economy: Growth or Stagnation? — Cambridge: Cambridge University Press.. 2016, pp. 429–468. doi:10.1017/9781316534502.012

Oxxley, L., Le, T., J Gibson, J. Measuring Human Capital: Alternative Methods and International Evidence. [Текст]/ Oxxley, L., Le, T., J Gibson, J. // Korean Economic Review. Korean Economic Association, 2008 vol. 24, pages 283–344.

Petkova, T.A. Chelovecheskiǐ kapital kak osnovnoǐ faktor innovacionnogo razvitiya predpriyatiǐ. [Текст] / Petkova, T.A. // Vestnik Chelyabinskogo gosudarstvennogo universiteta. Ekonomicheskie nauki, 2020, No 6 (440)., vyp. 69. p. 218—224. DOI 10.47475/1994–2796–2020–10626

Petty, W. The economic writings of Sir William Petty/ Petty, W., Graunt, J., & Hull, C. H. — Cambridge: University Press,1899

President of Kazakhstan Kassym-Jomart Tokayev's State of the Nation Address, September 1, 2020[Электронныйресурс]// https://www.akorda.kz/ru/addresses/addresses_of_president/poslanie-glavy-gosudarstva-kasym-zhomarta-tokaeva-narodu-kazahstana-1-sentyabrya-2020-g

Rooijen-Horsten, M van, D. van den Bergen, M. de Haan, A. Klinkers, Tanriseven, M. Intangible capital in the Netherlands: Measurement and contribution to economic growth. [Текст]/ Rooijen-Horsten, M van, D. van den Bergen, M. de Haan, A. Klinkers and M. Tanriseven// Statistics Netherlands, The Hague/Heerlen, 2008

Sagadiev, K.A. Rol' chelovecheskogo kapitala v innovacionnom razvitii Kazahstana [Текст] / K.A. Sagadiev // Mezhdunarodnyj forum "Pervye Nazarbaevskie chtenija", "Novyj Kazahstan v novom mire", Ministerstvo obrazovanija i nauki RK i GU Nazarbaev centr, Astana, 28–29 November, 2012.

Serebryakova, N.A., Volkova, S.A., & Volkova, T.A. Metodika integralnoy otsenki chelovecheskogo kapitala regiona [Текст]/ Serebryakova, N.A., Volkova, S.A., & Volkova, T.A. // Proceedings of the Voronezh State University of Engineering Technologies, 2019, 81(3), 375–380. https://doi.org/10.20914/2310–1202–2019–3–375–380

Smith, A. The wealth of nations[Текст] /Smith, A. — New York: Vintage Books,2020

Statisticheskie dannye ENT / Raspredelenie vypusknikov shkol tekushhego goda po nabrannym ballam po rezul'tatam ENT v razreze oblastej (vypuskniki gorodskih shkol) [Электронный ресурс] // Retrieved November 28, 2020, from https://testcenter.kz/ru/stats/statisticheskie-dannye-ent/? PAGEN_1=2

Statisticheskie dannye ENT / Raspredelenie vypusknikov shkol tekushchegogoda po nabrannym ballam po rezul'tatam ENT v razreze oblastej (vypuskniki sel'skih shkol) [Электронный ресурс] // Retrieved November 28, 2020, from https://testcenter.kz/ru/stats/statisticheskie-dannye-ent/? PAGEN_1=2

Statistika obrazovanija / Chistyj kojefficient okhvata nachal'nym obrazovaniem (deti v vozraste 7–10 let) [Электронный ресурс] // Retrieved November 28, 2020, from https://stat.gov.kz/official/industry/62/statistic/7

Statistika obrazovanija / Valovyj kojefficient okhvata srednim obrazovaniem (deti v vozraste 7–10 let) [Электронный ресурс] // Retrieved November 28, 2020, from https://stat.gov.kz/official/industry/62/statistic/7

Statistika obrazovanija / Kojefficient valovogo okhvata vysshi mobrazovaniem (deti v vozraste 7–10 let) [Электронный ресурс] // Retrieved November 28, 2020, from https://stat.gov.kz/official/industry/62/statistic/7

Stigler, J.G. Riccardo and the 93 % labour theory of value [Текст] / Stigler, J.G. // The American Economic Review, 48,1958

Strategicheskij plan 2025 [Электронный ресурс] / Decree of the President of the Republic of Kazakhstan #636 dated on 15 February, 2018. Retrieved from https://primeminister.kz/ru/documents/gosprograms/stratplan-2025

The dynamics of main indicators [Электронный ресурс] / Statistical data of Kazakhstan // Retrived from 4/10/2020 www.stat.gov.kz

Total government expenditure on education[Электронный ресурс] // Retrieved November 28, 2020, from https://ourworldindata.org/grapher/total-government-expenditure-on-education-gdp? tab=table

UNDP. Human Development Report 2019. Beyond income, beyond averages, beyond today: Inequalities in human development in the 21st century [Электронный ресурс]. New York, 2019. http://hdr.undp.org/en/content/human-development-report-2019

Weisbrod, B.A. The valuation of human capital [Текст] / Weisbrod, B.A. // Journal of Political Economy, 1961, 69(5):425– 436.