

The human factors of the national economic development: a comparative analysis of Poland and Ukraine

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Abstract. A comparative assessment of the level of economic progress and indicators of human development in Poland and Ukraine as interconnected and at the same time strategic factors in building a competitive national economy has been carried out. The range of factors related to human development and the use of the country's labor potential, affecting the competitiveness of the national economy as a result of economic development, has been determined. These factors include: labor productivity, reflecting managerial, economic, institutional potential of competitiveness; educational turnover in the country, which characterizes the ability of the labor market to accept highly qualified specialists; the level of educational load on the population, which indicates the readiness and intentions of the country and its labor potential to move to the knowledge economy. A statistical model for determining the influence of these factors on the discrepancy between the levels of economic development of Poland and Ukraine has been built; using a statistical model, the influence of these factors was determined. The performed calculations of the influence of the factors of the role of freedom were to determine the reasons for Ukraine's lag behind Poland, concerning human development. The ways of increasing the rates of economic development of Ukraine on the basis of increasing material incentives, increasing costs for education, increasing educational burden on the population, using the mechanism of intentions are proposed.

Key words: competitiveness, human development, economic development, labor productivity, education, intentions.

JEL: J01, O15

Introduction

In modern conditions of globalization, building a competitive economy is the main task of national strategic management. An important clause for the implementation of this task is to study the issues of a generalizing assessment of the level of economic development of the national economy, as well as the factors that ensured it. The level of gross domestic product, traditionally used as a characteristic of development, is the quintessence of organizational, economic, institutional, managerial and other components of the national economic system.

The rate of development and competitiveness of the national economy as a result of the implementation of the economic strategy depends on many reasons, but the main factor is the human, which is expressed in the level of a) human development and b) labor efficiency.

The level of human development concentrates not only the results of the economic development strategy of the country, but also of the education systems. The latter is one of the areas in which conditions for the reproduction of labor power, and, consequently, labor efficiency, are formed. Human development as an economic goal and at the same time an instrument of economic growth, in the opinion of Vasyl Miklovda, Natalya Kubiniy and Sergey Moshak, «finds practical implementation in the potential of labor, the implementation of which ensures the purposefulness of the entire economic system; consistency of functioning of constituent elements of economy; monitoring the development of the economy and ensuring its competitiveness» [Miklovda V., Kubiniy N. & Mjshak S., 2015], which ensures the growth of labor efficiency as an indicator of the country's economic ontogenesis. The role of the human factor is indirectly confirmed by researchers who adhere to The Resource Curse Hypothesis, and argue that "countries with high natural resource endowments have experienced lower economic growth rates than countries with scarce stocks of natural resources. The resource curse is paradoxical, because production of natural resources has been the initial source of nearly all development, providing an almost immediate source of foreign exchange, attracting foreign capital and skills and increasing the availability of both raw materials for processing and a market for manufactured inputs" [Costantini V. & Monni S., 2008].

Labor productivity is a systemic tool with a wide range of impacts. First of all, the growth of labor productivity acts as an intensive factor in increasing the volume of gross domestic product as an indicator of the competitiveness of the economic system as a whole and the result of strategic management. Labor productivity, the level of which is calculated by the ratio of the gross domestic product and the number of employees, makes it possible to identify the quality of the development strategy. Secondly, the growth in labor productivity causes an increase in wages, which is the main source of human capital.

Thus, the determination of ways to increase the competitiveness of the national economy, which lie in the sphere of human potential and its labor component, is an important scientific task and is of great practical importance.

Theoretical premises

Determining the ways of economic development and the formation of competitive national economies are in the focus of scientific interests of a wide range of researchers. One of the most common approaches to studying this problem is to study the influence of spatial organization on the level of economic development. So, of interest is the publication by Przemysław Sleszyński, Adam Kowalewski, Tadeusz Markowski, Paulina Legutko-Kobus and Maciej Nowak, who study the impact of spatial chaos on economic development and defines: "The total annual costs of spatial chaos were estimated at not less than 20 billion euros per year». [Przemysław Sleszyński, Adam Kowalewski, Tadeusz Markowski, Paulina Legutko-Kobus & Maciej Nowak, 2020]. At the same time, the authors do not show how the elimination of spatial chaos will affect the growth of labor productivity, which ensures the efficiency of the economic system and its competitiveness. To some extent, the relationship between spatial organization improvement and job creation has been explored by Czerny, M., & Czerny, A . Considering the role of the spatial organization of the economy on the example of South and Central America, the authors argue that from external influence, "the most important actor in the shaping of regions' socioeconomic space is globalization - the global interests of enterprises representing different sectors of the economy ... is to go on being satisfied and often decide the locations of new infrastructural development, and therefore also the places in which new job opportunities arise"[Czerny & Czerny, 2019], which indicates economic development. At the same time, the creation of new jobs should be accompanied by an increase in labor productivity in the country as a whole, otherwise economic growth will be extensive, which requires additional costs and does not ensure compliance with the principle of efficiency.

The school of researchers of methodological and statistical aspects of assessing the level of development is of great interest. Among the representatives of this direction, one cannot but agree with Thomas V. and Chindarkar N., who emphasize the importance of correct measurement of development for the development itself [Thomas & Chindarkar, 2019]. Rafał Czyżycki proposes an improvement in methodological approaches to the analysis of economic development, arguing that "one of the factors significantly affecting the final result of ordering the regions in terms of socio-economic development is the choice of method used to obtain a synthetic measure of development" [Czyżycki, 2018]. In addition, when choosing a particular

method of assessing labor productivity itself, it is advisable to take into account Myklovda's comments declaring that "one of the main criteria for competition is labor efficiency" [Miklovda, Kubiniy & Moshak, 2015], which, in this study, is measured by the productivity of the national economy. Burda Michael C. declares the idea that "labor productivity depends on a host of factors that make it susceptible to significant measurement error. A correct assessment of these factors is crucial for our understanding of how labor markets operate in both the long and short term" [Burda, 2018]. At the same time, it is advisable to expand the research content of this school with analytical factor models.

It is advisable to highlight the problem of studying the dependence of the country's economic growth on the level of investment in human potential, which significantly enhances labor potential and contributes to an increase in labor productivity. Gustav Ranis and colleagues consider human development "the central objective of human activity and economic growth as potentially a very important instrument for advancing it" [Ranis, Steward & Ramire, 2000]. Kuada J. concludes that "economic development is both multidimensional and highly nonlinear. It entails dynamic change not only in production patterns and technology but also in social, political and economic institutions, as well as in patterns of human development" [Kuada, 2015]. Investments in people and education in rural regions of Poland as a way of progress was observed by Bazyli Czyżewski and Jan Polcyn (2016) as the important factor of development and "it was shown that in Poland, the theories of polarized development are more applicable than those of endogenic development" [Czyżewski & Polcyn, 2016]. The focus on human development as a driver of economic growth is underlined by Eric A. Hanushek [2013]. The role of the human factor is indirectly confirmed by researchers, adherents of "The Resource Curse Hypothesis", who argue that "countries with high natural resources endowments have experienced lower economic growth rates than countries with scarce stocks of natural resources. The resource curse is paradoxical because production of natural resources has been the initial source of nearly all development, providing an almost immediate source of foreign exchange, attracting foreign capital and skills and increasing the availability of both raw materials for processing and a market for manufactured inputs" [Costantini & Monni, 2008].

Another direction in the investigation of human potential and its effective use in the economy is the study of behavioral factors, among which there are intentions that perform an important function; in our previous publications, there was insisted the conclusion about the

importance of intentions for human development and "the formation of new knowledge and its transformation into innovation as the basis of the competitiveness of the economic system" [Kubiniy, 2019].

At the same time, insufficient attention of researchers is paid to the problems of identifying the factors of human development that affect the competitiveness of the economy. The range of factors traditionally used in the analysis of human development is not supplemented by new indicators that contribute to the study of their impact from different angles.

The above descriptions determined the setting of the article's goal - research and comparative analysis of the influence of factors on the economic development in Poland and Ukraine.

To achieve the goal, the following tasks were solved:

1. Identification of factors influencing the level of economic development.
2. Building a statistical model of the influence of factors in Poland and Ukraine and measuring the degree of influence.
3. Justification of proposals to intensify actions aimed at increasing the pace of development and the formation of a stable competitive economy in Ukraine.

Methodology

During the study, we used the methods of causal induction, which allows us to establish a causal relationship between the productive and factor indicator (in our study, between the level of GDP per capita and factors of human and labor potential), scientific abstraction, which allows us to form a logical model of the influence of intentions on human development and focus on the determinants of development.

When choosing a statistical method for analyzing the influence of factors on the level of economic development, we were guided by the following principles:

- simplicity of calculations,
- clarity of statistical logic,
- availability of information for analysis.

It is possible to identify the influence of the factor of labor productivity and the training of skilled labor on the level of development of the national economy (EDC) using a statistical model:

$$(1) \quad EDC = f(W * ET * N)$$

$$(2) \quad W = \frac{GDP}{NP}$$

GDP – gross domestic product

NP- population of the country.

The next factor is number of employees per student

$$(3) \quad ET = \frac{E}{HS}$$

E –number of employees,

HS – number of students of higher education.

We call this indicator educational turnover (ET); the higher this coefficient, the more opportunities students have for employment. In other words, this indicator characterizes:

- a) the ability of the labor market to accept graduates of higher education,
- b) indirectly – the level of development of the economy, which needs highly qualified specialists.

The next factor, the educational burden on the population (EL), is calculated by dividing the number of students by the number of the population.

$$(4) \quad EL = \frac{NS}{NP}$$

The significance of this factor is that it shows the following:

- a) the strategy of the state to increase the level of human development through the education system;
- b) the level of education of society, which is especially important in the context of the transition to the knowledge economy and the need to live and work in an innovative society.

Results

A comparative assessment of the gross domestic product in Poland and Ukraine is presented in Table 1, the data of which suggest that the level of competitiveness of Poland

is significantly higher than that of Ukraine, despite the fact that the growth rate of the gross domestic product in Ukraine in 2019 compared to 2015 was higher than in Poland.

Table 1. Main indicators of the economic development of Poland and Ukraine in 2015-2019.

Indications		2015	2016	2017	2018	2019	Growth rate 2019/2015,%
Poland	GDP, bil .dol., PP	478	472	527	587	592	123.8
	Average number of employees, mln. persons	16	15	16	16	16	100.0
	Labor productivity, thous. dol.	31	31	33	37	37	119.4
Ukraine	GDP, bil. dol., PP	90	93	112	131	155	172.2
	Average number of employees, mln. persons	16	16	16	16	17	106.3
	Labor productivity, thous. dol.	6	6	7	8	9	150.0
Labor productivity in Poland/labor productivity in Ukraine		5.2	5.2	4.7	4.6	4.1	X

Sources: based on Knoema, Average number of employees and self-employed in Poland from 2003 to 2019, Employed persons by public and private sector in Poland 2008-2018, Swaid, Statistics Poland, Statistical Yearbook of Ukraine for 2017, Statistical Yearbook of Ukraine for 2018, Statistical Yearbook of Ukraine for 2019.

As follows from the data shown in Table 1, during the survey period, there is an increase in labor productivity, but the ratio of labor productivity levels shows that in Ukraine the efficiency of labor force use was four times lower in 2019 than in Poland.

The level of labor productivity and the level of human development are interconnected, with the data presented in Table 2.

Table 2. The number of people employed and students in Poland and Ukraine in 2015-2019

Indicatioins		2015	2016	2017	2018	2019
Poland	Total population, mln. persons.	38.4	38.40	38.4	38.4	38.4
	Employed persons, mln	14. 8	15.3	15.7	15.9	16.1
	Number of students, thous.	1,405.1	1,348. 8	1,291.9	1,230.3	1,204.0
	Number of foreign students, thous.	57.1	65.8	72.7	78.3	82.2
	Public expenditure on education in relation to GDP, %	4.44	4.36	4.30	4.33	4.33
Ukraine	Total population, mln. persons	42.6	42.4	42.2	42.0	41.7
	Employed Persons, mln	16,0	16.3	16.2	16.4	16.6
	Number of students, thous.	1,375.2	1,369.4	1,330.0	1,322.3	1,266.1
	GDP, bil.grn..	1,988.5	2,385.4	2,983.9	3,560.6	3,974.6
	Public expenditure on education, mln. grn	114,193.5	129,437.7	177,915.8	210,032.3	238,758.7
	Public expenditure on education in relation to GDP, %	0.06	0.05	0.06	0.06	0.06

Sources: based on Bank Danych Makroekonomicznych, Number of studying foreigners in Poland 2014-2020, Higher education. Swaid, Statistics Poland, Statistical Yearbook of Ukraine for 2017, Statistical Yearbook of Ukraine for 2018, Statistical Yearbook of Ukraine for 2019.

Due to the changes in the budget classification, since 2019, expenditure on education relative to GDP has been presented together with expenditure on science (4.75%). That is why we accepted the figure, equal 2018 level – 4.33%.

The information presented in Tables 1 and 2 allows to build a statistical model of the influence of factors on the level of development and determine which of them had the greatest impact on the excess of the development indicator of the Polish economy in comparison with the Ukraine.

The factor model of Poland's economy has acquired the following numerical exposition:

$$(5) \quad \frac{GDP}{population} = 15416,6720 = 36770,1900 * 13,4167 * 0,03125$$

In Ukraine:

$$(6) \quad \frac{GDP}{population} = 3717,0177 = 9337,3500 * 12,7692 * 0,03118$$

The influence of factors is as follows.

Effect of labor productivity (EW):

$$(7) \quad EW = (36670,1900 - 9337,3500) * 13,4167 * 0,03125 = 11501,7925$$

Effect of educational turnover (EET):

$$(8) \quad EET = 9337,3500 * (13,4167 - 12,7692) * 0,03125 = 188,9267$$

Factor of educational burden on the population influence (EEL) effects:

$$(8) \quad EEL = 9337,3500 * 12,7692 * (0,03125 - 0,0318) = 8,3461$$

Total effect: 11,700 US dol.

Negative factors influencing the level of development of Ukraine regarding human development and, accordingly, labor potential are as follows:

1. Low wages, which should serve as a motivator for high labor productivity.

The average salary in Poland in 2019 was 31,970 US dollars, while in Ukraine it was 3,988, the ratio of the levels is eightfold. The ratio of wages and labor productivity in Poland and Ukraine is shown in Fig. 1.



Sources: based on Table 1, Table 2, Swaid, Statistics Poland, Statistical Yearbook of Ukraine for 2017, Statistical Yearbook of Ukraine for 2018, Statistical Yearbook of Ukraine for 2019.

In the absence of material incentives for labor, labor efficiency falls, which significantly reduces the economic development potential.

2. Insufficiently high level of human development for a European country, published in the UN Reports. Table 3 presents data on the human development index of Norway, which consistently ranks first in the ranking of countries, Poland and Ukraine for 2015-2019.

Table 3. Human Development index Poland and Ukraine 2015-2019.

	2015	2016	2017	2018	2019
Norway	0.949	0.950	0.953	0.954	0.957
Poland	0.855	0.870	0.865	0.872	0.880
Ukraine	0.743	0.770	0.751	0.750	0.779

Source: based on Human Development Report 2016, Human Development Report 2018, Human Development Report 2020.

As follows from the data in the table, the level of human development in Ukraine is significantly lower than in the compared countries. One of the reasons for this situation is the low indicator of gross domestic product per capita, which speaks of a vicious circle: a low indicator of human development inhibits economic growth, and the slowdown in economic progress in the country reduces the human development index.

3. Inadequate financing of the education system. As follows from the above data, the share of government spending in Poland on education is more than 4% of the gross domestic product, and in Ukraine - less than 1%. At the same time, the gross domestic product is 3.8 times higher in Poland than in Ukraine. Strengthening the financial support of education and science is a strategic task of Ukraine in the context of the transition of the world economy to a knowledge economy, in which a person and their level of knowledge are the main factors in building a competitive economic system of the country.

Thus, the main directions of increasing labor productivity in Ukraine are highlighted: increasing the level of wages, increasing financial support for education, carrying out a set of measures aimed at increasing the indicator of human development.

To ensure the harmonious development of the economy, it is proposed to observe the "Golden rule of competitive proportion": The specified proportion provides a condition for the regularity of development of all components of economic development and building competitiveness considered in this study.

The growth rate of gross domestic product should be higher than the growth of employees.

The growth rate of employees should be higher than the growth of number of students.

The rate of number of students should be higher than the growth of population.

$$\begin{aligned} & \textit{Golden rule of competitive proportion} = \\ & \textit{Growth rate of GDP} > \textit{Growth rate of employees} > \\ & \textit{Growth rate of students} > \textit{Growth rate of population} \end{aligned}$$

An important direction of stimulation is recommended to activate the mechanism of intentions, that is, systemic, clearly defined, strategically verified development goals. The role of intent was emphasized by the Japanese researcher Nonako Ikudjiro, who described the spiral of knowledge and proved that the spiral is driven by intent. Thus, intention acts as a driving force, a lever for the development of the knowledge economy and, accordingly, human potential as the basis of the knowledge economy. To implement these areas, it is recommended to develop a national strategy for the development of human potential in Ukraine, with a specific program for its implementation.

Summary, recommendations

The human factor in modern conditions is decisive in building a system of competitiveness of the national economy.

The results of the analysis show that the level of development of the Polish economy is significantly higher than that in Ukraine. At the same time, Poland is also significantly ahead of Ukraine in terms of labor productivity, average wages, and the level of human development.

The constructed statistical model for analyzing the human components of economic development made it possible to confirm the factors due to which Ukraine lags behind.

The reasons for the lagging have been identified, including: a low level of material incentives for those employed in Ukraine, lack of an adequate level of funding for education, insufficient attention of the state authorities to the problems of human development. The elimination of these reasons is complemented by the use of the intention mechanism. The main directions of increasing the level of economic development in this study are as follows:

1. Creation of a human development strategy in Ukraine and preparation of a program for its implementation; the program will link strategic development intentions with concrete practical actions.
2. Strengthening financial support for the education system in Ukraine.

3. Improving the analytical base of the influence of factors on the level of economic
development. Application of the rule of harmony.

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