BENEFITS AND DRIVERS OF INCLUSIVE HUMAN CAPITAL DEVELOPMENT

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INTRODUCTION

Why are some countries rich and others are poor? D. Acemoglu and J. Robinson (2012) believe that the reason is that economic institutions in some of them are aimed at extracting maximum income, while in others they promote the creation of inclusive markets so that people have an equal opportunity to realize their talents. M. Spence and R. Solow (COMMISSION ON GROWTH AND DEVELOPMENT, 2008) also emphasize the importance of inclusive human capital development through investment in education, health, knowledge transfer, and the involvement of non-employed labor in production.

Why is it now so important to use inclusive approaches? The emergence of large, fast-growing countries, such as the BRIC group, which demonstrate new fruitful approaches to the organization of socio-economic processes, forces us to look for new ideas for reviving economic growth.

The most promising among them is the inclusive development paradigm. Therefore, it is very important to conduct a detailed analysis of the benefits that it can bring to our world and the driving forces that will influence the implementation of the necessary changes.

The paper aims to analyze the benefits and drivers of economic transformation through the development of human capital using inclusive principles.

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LITERATURE REVIEW

The paradigm of inclusive development has become relevant in the conditions when several factors of instability have become more acute in the world. Income inequality and outstripping private capital growth have reached global proportions. According to the OECD (n.d.), "The top 10% of income earners take home over ten times more pay than the bottom

10%". This creates conditions for increasing social instability, which requires the use of adequate countermeasures.

The world has been undergoing the process of transition of humanity as a system, to a new dynamic state for about 80 years: from quasi-hyperbolic growth to stationary functioning in terms of the number of people. Such a fundamental change as the demographic transition (KAPITSA, 1996; KREMER, 1993) could not but manifest itself in various socio-economic aspects, in particular, in the decline in economic growth (HAWKSWORTH; AUDINO; CLARRY, 2017; OREKHOV; PRICHINA; SHCHENNIKOVA, 2020) and the depopulation of several developed countries.

M. Spence, R. Solow, et al., studying the experience of sustainable growth in the post-war period of 13 economies with an annual rate of about 7% (COMMISSION ON GROWTH AND DEVELOPMENT, 2008), formed several recipes for accelerating economic growth. They noted the importance of foreign direct investment, education abroad, which contributes to the creation of international knowledge-sharing networks, factors of catch-up development and globalization of the economy, as well as the possibility of involving additional labor in industrial production. They pointed out that no country has managed to maintain rapid growth without significant public investment – in education, health, and infrastructure. In their view, equity and equality of opportunity are important elements of a sustainable growth strategy. Inequality concerning certain categories of people prevents the use of their talents in the development of the economy and can also lead to their actions to undermine the social order (MOSALEV et al., 2018; KHETAGUROVA et al., 2018; KRYUKOVA; KHETAGUROVA, 2020). The UN General Assembly noted in The Agenda for Sustainable Development for the period up to 2030:

> Billions of our citizens continue to live in poverty and are denied a life of dignity. There are rising inequalities within and among countries. There are enormous disparities of opportunity, wealth, and power. Gender inequality remains a key challenge. Unemployment, particularly youth unemployment, is a major concern… . (UN GENERAL ASSEMBLY RESOLUTION, 2015, p. 5).

The New Agenda aims at balancing the three pillars of sustainable development: social, economic, and environmental. It is especially worth highlighting the following among the 17 sustainable development goals, concerning inclusive topics: "Reduce inequality within and among countries", "Achieve gender equality and empower all women and girls" and "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all". (UN GENERAL ASSEMBLY RESOLUTION, 2015, p. 14).

The World Economic Forum (WEF) (2018) has made an important contribution to the practice of inclusive development. In 2018, it developed the Inclusive Development Index – IDI, which is based on three key indicators of sustainable development that correspond to the 2030 Agenda: growth and development, inclusiveness, as well as environmental sustainability, and generational equality. Such an index more holistically reflects the picture of socio-economic development than just the GDP indicator, the criticism of which, as an indicator of well-being, is recognized even by its developers (VAN DE VEN, 2014).

The WEF report notes that decades of prioritizing economic growth over social justice have led to historically high levels of wealth inequality. According to WEF data for five years, "Income inequality has risen or remained stagnant in 20 of the 29 advanced economies, and poverty has increased in 17"... "In Intergenerational Equity and Sustainability, the trend is encouraging, with a decline in 56 of the 74 emerging economies" over the past ten years (WORLD ECONOMIC FORUM, 2018, p. 4). Thus, it is highly unlikely that it will be possible to successfully carry out a set of changes necessary for the implementation of inclusive transformations in the current situation and the presence of the trends indicated above.

Along with the fact that the index developed by the WEF drew the attention of society to inclusive development, it also introduced elements of eclecticism. Summing up the three different components of sustainable development under the single name "inclusive", in fact, distracts attention from the actual inclusive changes against the background of growth and development, as well as environmental sustainability. Therewith, the IDI does not sufficiently take into account such important indicators for rapid and sustainable development as human

capital and access to education. If we keep in mind the use of IDI as an indicator of sustainable development, it is no better than such indices as The Social Progress Index (PORTER; STERN; GREEN, 2015; STERN; EPNER, 2018), The Legatum Prosperity Index (LEGATUM INSTITUTE, 2019; OREKHOV et al., 2020), and even the Human Development Index (UNITED NATIONS DEVELOPMENT PROGRAMME, 2018), which include indicators of human capital and/or education much more fully.

The Eurasian Economic Commission (n.d.) defines inclusive growth as "economic growth accompanied by the creation of favorable conditions for improving the quality of life and ensuring equal opportunities for all groups of the country's population". The World Bank understands inclusive growth as one that leads to poverty reduction, involves a significant part of previously unused labor resources in productive activities, and ensures equal opportunities (IANCHOVICHINA; LUNDSTROM, 2009). Another definition is given by The Organization for Economic Co-operation and Development (OECD, n.d.): "Inclusive growth is economic growth that is distributed fairly across society and creates opportunities for all".

The idea of inclusive growth has also been embraced in developing countries. In the case of China, the concept of inclusive development was unveiled at the fifth APEC session in September 2011. The main goal of inclusive growth was to spread the benefits generated by economic growth to all, as well as to achieve a balance in economic and social progress. The achievement of this goal should be achieved in four ways: to prioritize the development of human resources, to focus on achieving full employment; to improve the skills of employees, and all this should be based on social security and sustainable development (AVDOKUSHIN; IVANOVA, 2014).

Dmitry Medvedev, in 2011, when he was President of Russia, speaking at the BRICS summit in Boao (China), formulated the 5-IN concept concerning inclusive development: Innovations, Investments, Infrastructure, Institutions, and Intellect (MEDVEDEV, 2011). Thus, the understanding of inclusive development varies quite a lot in different international organizations and countries.

METHODS

The type of research was theoretically- applied, aimed at applying new knowledge to solve a specific problem of human capital development using inclusive principles. The applied aspect of the study was to determine the degree of profitability of an inclusive approach to economic dynamics, as well as the main tools for inclusive transformation.

The main method of research was metatheoretical system analysis (MEADOWS, 2008), which allowed building a holistic picture of the phenomenon under study, in particular, a systematic view of humanity, which is undergoing drastic changes, including the transition to the use of an inclusive paradigm. The importance of its use is determined by the fact that humanity behaves as a single system with a complex and nonlinear interaction of components.

The main method of the next level was the economic analysis of indicators that characterize humanity as a system: the number of people (N), GDP per capita at PPP (GDP/C), the amount of explicit knowledge of humanity (Z), and the number of years of education (E). Therewith, we studied mainly the values of the order, which change many times over the centuries. The following methods were also used in the work:

- Econometric methods (regression with a causal relationship). In particular, the dependence on the population of the Earth of the GDP per capita and the amount of explicit knowledge – Z. A comparison of these regressions reveals a new dependence of GDP per capita on the amount of explicit knowledge.

- Repeated trend studies, in particular, the exponential trend of GDP per capita from Mean years of schooling – E, which allows illustrating the systemically exponential dependence of the contribution to GDP per capita on the level of education of specialists (OREKHOV et al., 2019).

- Forecasting the dynamics of GDP per capita in the long term with obtaining an analytical connection with the volume of explicit knowledge of humanity.

- A mathematical model of the profitability of educational differentiation as an important force that counteracts inclusive changes.

- Methods of knowledge management (QUINTAS et al., 2004; SKYRME, 1998; NONAKA; TAKEUCHI, 1995), which made it possible to assess the dynamics of the volume of explicit knowledge of mankind

- Desk research. It allowed identifying the main driving forces of inclusive transformation, as well as making estimates of the amount of explicit knowledge of humanity (LIBRARY OF CONGRESS, n.d.; USHAKOV, 2007; SUKIASYAN, 1997; PROKHOROV, 1987; PRICHINA et al., 2019).

- A method of analyzing the field of forces proposed by sociologist Kurt Lewin (1935, 1951) to analyze the possibilities of change.

- Elements of the cognitive modeling methodology (KOSKO, 1986; PODVESOVSKII; ISAEV, 2018), which were used to assess the magnitude of the forces of inclusive transformation.

- Analysis of data from open databases of analytical data (MADDISON, 2008; THE WORLD BANK, n.d., 2018, 2021b; UNITED NATIONS, 2019; OECD, 2020; UNITED NATIONS DEVELOPMENT PROGRAMME, 2018).

The research was conducted at the Sinergy University, Moscow.

Information collection procedures and tools:

We used secondary sources of information: monographs, electronic databases, statistical data, and the results of our research.

The information was collected using the Yandex Internet search engine, as well as through links to literature in authoritative publications.

Deduction and induction were used as the main information processing procedures.

The process of forming a problem situation consisted of studying the sources of information on the issue of inclusive transformation and identifying the most powerful forces that promote and hinder inclusive change. It was believed that stakeholders with influence on the situation and the corresponding financial, political, informational, and other resources are behind each force. These stakeholders have their benefits from changing or maintaining the existing situation, the value of which can be estimated by experts. All these factors determine the power of the corresponding force, which can be approximately quantified in the logic of cognitive modeling.

The process of selecting the main quantitative parameters that characterize humanity consisted in analyzing the models and hypotheses proposed by various authors about the main factors that characterize this system, in particular: the number of people (N), GDP per capita at PPP (GDP/C), the amount of explicit knowledge of humanity (Z) and the number of years of education (E).

When analyzing the main forces of inclusive transformation, we primarily used the sources of information presented in the following works by D. Acemoglu, J. Robinson (2012), Commission on growth and development (2008), OECD (n.d.), S.P. Kapitsa (1996), M. Kremer (1993), J. Hawksworth, H. Audino, R. Clarry (2017), UN General Assembly Resolution (2015). We also used information provided in well-known, reliable databases (MADDISON, 2008; THE WORLD BANK, n.d., 2018; UNITED NATIONS, 20019; OECD, 2020; UNITED NATIONS DEVELOPMENT PROGRAMME, 2018).

Data on GDP at PPP were measured in international dollars and, if necessary, converted to the required year using a deflator (THE WORLD BANK, 2021b). Data on the educational levels of employees were taken into account following the ISCED 2011 classification (UIS UNESCO, 2013), data on the storage volume of the largest libraries were obtained from the Library of Congress website and secondary sources (NONAKA, TAKEUCHI, 1995; LIBRARY OF CONGRESS, n.d.; USHAKOV, 2007; SUKIASYAN, 1997; PROKHOROV, 1987).

We used data on the volume of books stored in the largest libraries in the world, primarily in the Library of Congress to measure the amount of knowledge (LIBRARY OF CONGRESS, n.d.; USHAKOV, 2007; SUKIASYAN, 1997; PROKHOROV, 1987; PRICHINA et al., 2019).

Statistical analysis

Regression analysis was used as the main method of statistical information processing, which was performed using the Microsoft Excel 2010 computer program. In the course of the study, a search was made for a regression dependence in an analytical form, which provides the smallest regression

$\Delta R = 1 - R^2$, where R^2 is the coefficient of determination.

RESULTS

Economic dynamics and population of the Earth

Attempts to compare the growth dynamics of the economies of countries that occurred at different times, come across the question, is such a comparison correct? Why exactly from 1950 to 1975 there was a rapid growth of several economies? Why are the growth rates of developed countries currently declining (HAWKSWORTH; AUDINO; CLARRY, 2017; IANCHOVICHINA; LUNDSTROM, 2009; HAWKSWORTH; CHAN, 2013)?

From a systemic point of view, the main characteristic of modern society is that it is in a state of demographic transition. Humanity has evolved for many millions of years, and all this time there has been relatively slow and monotonous growth in the number of people. Following this, there was an increase in knowledge, the development of technologies, and an increase in the well-being of the population. Approximately, the growth of the number of people (N) occurred according to the hyperbolic (1) dependence on time (KAPITSA, 1996; KREMER, 1993; FOERSTER; MORA; AMIOT, 1960), although various catastrophes, epidemics, wars, and technological cycles made deviations in it (KAPITSA, 1996; DEEVEY, 1960).

$$N \approx C/(T_1 - T) \qquad (1)$$

However, this pattern was restored due to the system properties. Accordingly, this dependence is appropriately called quasi-hyperbolic. The peculiarity of such dependence is that it has a singularity, i.e. it rushes to infinity with a singularity at the time $T_1 = 2027$. As we approached it, the scientific world began to discuss the possibilities of critical overpopulation and the death of humanity in general. However, from about 1960, it became apparent that the population began to grow more slowly than in a hyperbolic relationship, and this process of change was called the demographic transition. Thus, we live in a time close to a special point in the history of mankind, near which the integral characteristics of the system change very quickly and even systemically unpredictable.

Note that complex systems have a very high resistance to changes in their state. They respond to external influences like a flexible network. After its termination, the system returns to its previous state under the influence of numerous feedbacks. Such a system can change to a different state only if the impact is applied to its critical point, which in this case turned out to be the system of childbearing.

To understand what factors influence economic dynamics, consider the dependence of GDP per capita at purchasing power parity (PPP) on the population of the Earth (Figure 1). Here, GDP is given in thousands of international dollars of 1990, according to A. Maddison (2008).

As a regression curve in Figure 1, a linear dependence (dotted line) of type (2) can be used, where m and γ are constants, and GDP per capita is denoted by the letter G.

$$G/N = m + \gamma \cdot N \qquad (2)$$

The power trend (3) gives better results. For it, the regression error $\Delta R^2 = 1 - R^2$ is 0.6%, compared to 2.7% for a linear trend.

$$G/N = 0.672 \cdot N^{1.27} \qquad (3)$$

From the point of view of the theory of inclusive economics, the dependence presented in Figure 2 has a deep meaning. It should be noted that the value of GDP per capita characterizes not only the average cost of goods and services received by the population, but with a coefficient equal to about two, and labor productivity in a given country since most of the goods are produced by employees. Therefore, next, we will conditionally refer to the value of GDP per capita or G/N, as a characteristic of labor productivity.

Accordingly, dependencies (2), (3) indicate that the larger the number of humanity, the greater the productivity of people, on average. If the number of inhabitants of the Earth did not exceed 1 billion people (about 1830), then labor productivity, on average, would be about 10 times less than at present. This shows the systemic properties of humanity, which develop as a single synergistic organism.

Figure 2. The dependence of GDP per capita on the World's population

y = 1.263x$^{-0.976}$
R² = 0.973

y = 0.672x$^{1.267}$
R² = 0.994
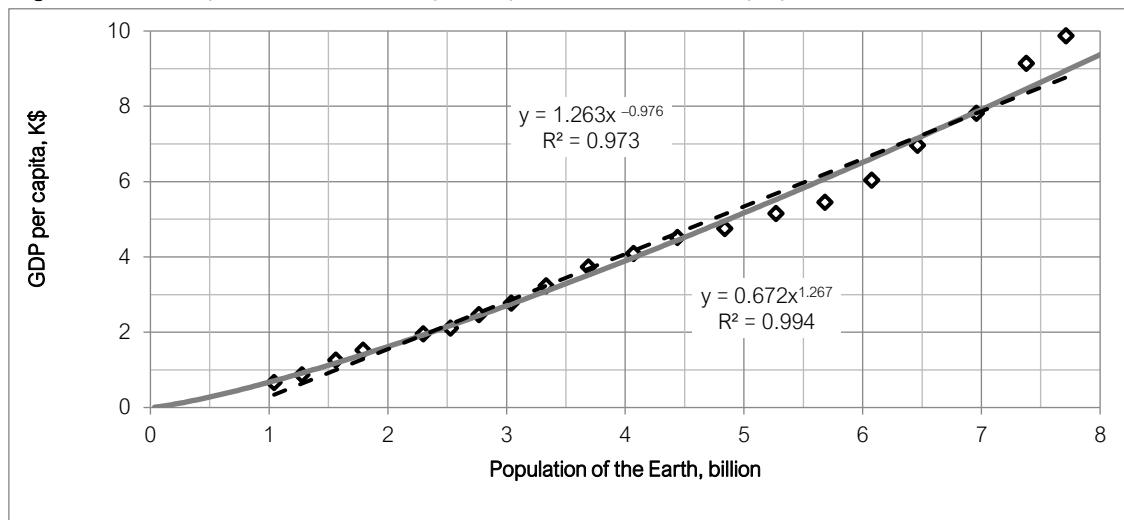
Source: Search data.

As a demographic transition takes place and population growth slows down, the rate of GDP growth per capita slows down accordingly. With the stabilization of the population of the Earth, therefore, it is possible to predict the cessation of the growth of GDP per capita, if adequate measures are not taken to change the dependence of economic growth.

The involvement in the labor activity of those groups of the World's population that currently make a small contribution to productive activity is among such measures. This is one of the main tasks of an inclusive economy. The most powerful tool for such inclusive events is to raise the educational level of the entire world population.

The role of explicit knowledge in an inclusive economy

The empirical dependencies (2), (3) are far from obvious and it is not easy to understand why they are the same, and with a very low regression error. S.P. Kapitsa (1996), having analyzed dependence (1), drew attention to the fact that according to it, the growth rate of the Earth's population is proportional to the square of the number of people:

$$dN/dT = N^2/C \qquad (4)$$

In his opinion, this indicates collective interaction, which "... is determined by the mechanism of dissemination and reproduction of generalized information on the scale of mankind" (KAPITSA, 1996, p. 57). It also follows from expressions (2), (3) that the value of GDP grows mainly in proportion to the number of people in the power n close to 2, and it is also reasonable to look for the origin of this pattern (5) in the dissemination of human knowledge.

$$G = k \cdot N^n \qquad (5)$$

It is natural to assume that the information interaction of people was realized based on the growth and spread of explicit knowledge. To estimate their number, one can use data on the

storage volume of books and brochures in the largest libraries, in particular, in the Library of the US Congress, as well as in the Library of Alexandria (NONAKA; TAKEUCHI, 1995; LIBRARY OF CONGRESS, n.d.; USHAKOV, 2007; SUKIASYAN, 1997; PROKHOROV, 1987). To represent the amount of knowledge in the Library of Alexandria (PROKHOROV, 1987) in a form comparable to that of the Library of Congress, it was assumed that it contained 400,000 scrolls with a volume of one-third of the book. Graphically, the dependence of the amount of knowledge on the number of people is shown in Figure 3.

It can be seen that this dependence is well approximated by the power trend (6) with $\Delta R^2 = 0.07\%$.

$$Z = 3.1 \cdot N^{1.27} \qquad\qquad (6)$$

Figure 3. The dependence of the amount of human knowledge on the number of people
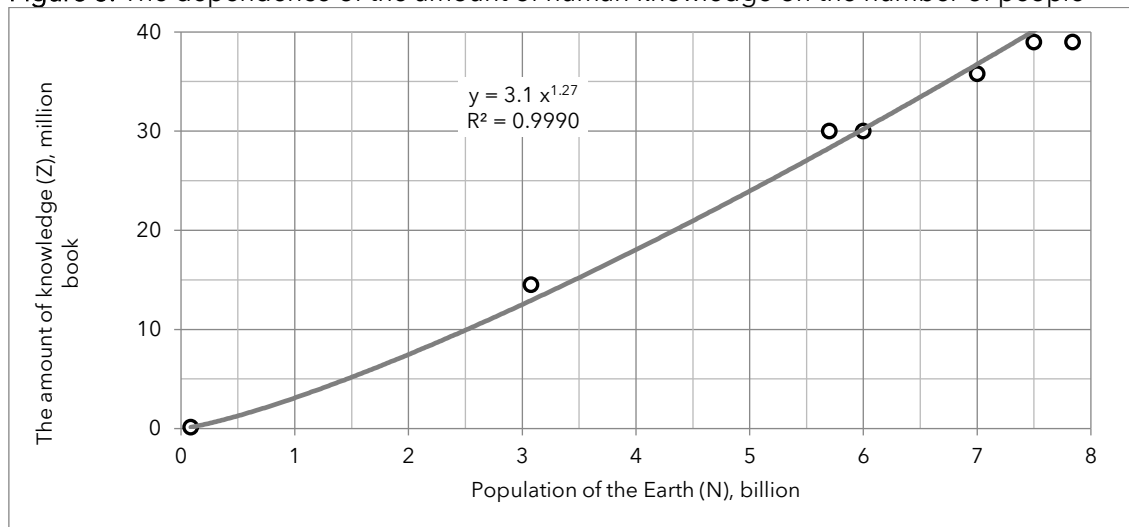
Source: Search data.

In this case, the exponent is 1.27, as in equation (3). Since knowledge is created and used by people, the proportionality of the amount of knowledge to the number of people can be considered a logical pattern. Over time, a person's tools for working with knowledge have become more and more perfect, which probably explains the fact that the exponent in the formula (6) is greater than one and is approximately equal to 1.27.

From equations (3) and (6), we can obtain a formula for the dependence of GDP per capita on the amount of knowledge (7), where G/N is given in thousands of dollars of 1990 PPP, and Z in millions of conditional book, $A \approx 0.36$.

$$G/N = A \cdot Z \qquad\qquad (7)$$

It seems that this formula has a fundamental meaning, and this pattern will have a significant impact on economic dynamics. Its importance lies in the fact that it explains the relationship between labor productivity and such a systemic characteristic of humanity as the amount of explicit knowledge.

It should be noted that the indicator of the degree of approximation dependence (6) may depend on the error with which the estimate of the storage volume in the Library of Alexandria is made. If one removed this point, the exponent will be 1.08. In this case, the expression (7) will take the form $G/N = A \cdot Z^{1.18}$, which does not fundamentally change the result.

Equation (3) shows the total number of people, regardless of whether they are engaged in productive activities and what level of education they have, as well as whether they contribute to the creation and application of complex knowledge. In reality, the number of people who contribute to productive activity $N_W \sim 0.5\ N$. The number of people who work with knowledge is still much smaller.

In the context of a decrease in the growth rate of the world's population, and, accordingly, a decrease in the annual growth of **G/N**, it is possible to use the strategy of inclusive development as a new resource to increase explicit knowledge and **G/N,**. To do this, it is necessary to activate inclusive human resources in order to increase the amount of explicit knowledge and use it for productive activities. Currently, developed countries create about 2/3 of scientific publications and most actively involve them in the production process. The problem is that the system of knowledge creation in developed countries has not increased its productivity in recent years (OREKHOV, 2015; PRICHINA; OREKHOV; SHCHENNIKOVA, 2017). Therefore, the growth of knowledge production will mainly come at the expense of developing countries. The interaction between the two parts of knowledge creation can produce a positive result for all of humanity.

The role of education in an inclusive economy

We have considered the impact of explicit knowledge on labor productivity above. However, real production activities are carried out by people, through the use of implicit knowledge of their consciousness, moreover, the higher their level of education, the greater the effectiveness of their activities. The simplest quantitative assessment of the productivity of workers can be made using the formula of J. Mincer (1994), according to which the employee's earnings exponentially depending on the number of years (E) of his/her education $Y = Y_0 e^{RE}$. Therewith, it is considered that earnings relatively objectively characterize the employee's labor contribution. The work of R. Barro and J. Lee (2001) shows that GDP per capita for various countries also depends exponentially on the average number of years of education of the population, and according to data for 2000 in international dollars in 2019, this dependence is expressed by the formula (8):

$$\textbf{G}/N = 460 \cdot 10^{0.2 \cdot E} \tag{8}$$

According to data for 2018 (THE WORLD BANK, n.d.; UNITED NATIONS DEVELOPMENT PROGRAMME, 2018), a similar relationship for the 72 largest economies in terms of GDP at PPP is shown in Figure 4.

Figure 4. GDP per capita's dependence on Mean years of schooling
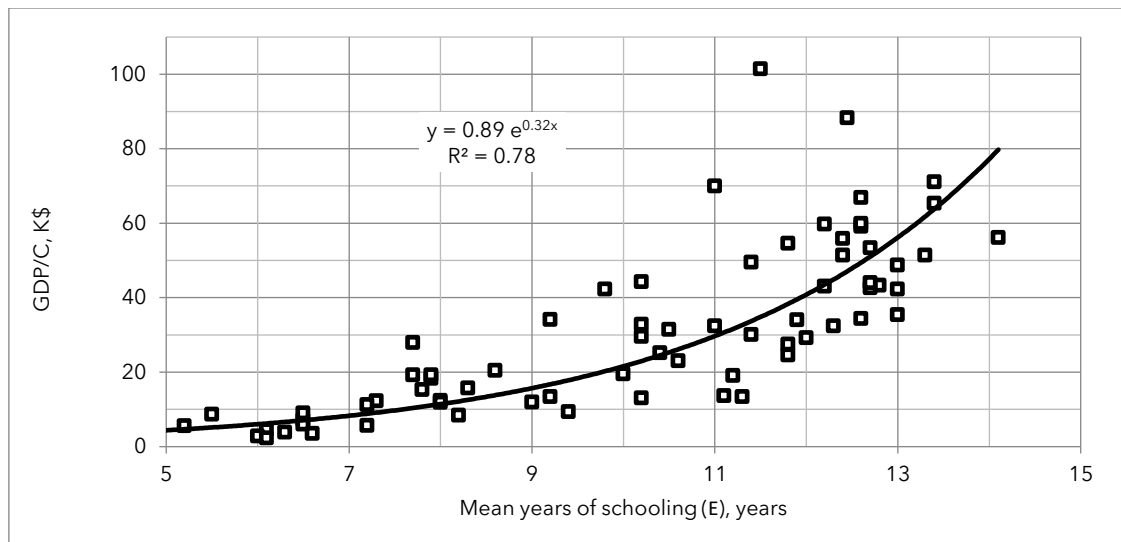
Source: Search data.

To convert the trend equation to decimal form, the exponent shall be divided by Ln(10) and this dependence in 2019 dollars by PPP will have the form:

$$G/N = 892 \cdot 10^{0.138E} \tag{9}$$

It can be seen that the structure of the model has remained similar (8), and its numerical characteristics have changed significantly, which is due to the difference in the time of the study and the sample of countries. In this case (Figure 4), the average number of Mean years of schooling for each country was used. Figure 5 shows the dependence (10) of the

contribution to GDP of employees of various educational levels in 2017 dollars obtained by the authors (OREKHOV et al., 2019).

$$J_E = 20.5 \cdot 10^{0.246\,E} \tag{10}$$

The formula (10) is also exponential with a sufficiently high coefficient of determination $R^2=0.95$. Since, in contrast to the dependence shown in Figure 4, there is no addition of the contributions of specialists with different levels of education, the degree index is almost twice as large as in equation (9), which is correspondingly compensated by a smaller constant coefficient. We also note that the J_E value indicates the contribution to GDP of an individual employee, and G/N indicates what value of GDP falls on each resident, which is about half as much.

Figure 5. Contribution to the employee's GDP depending on the number of years of schooling
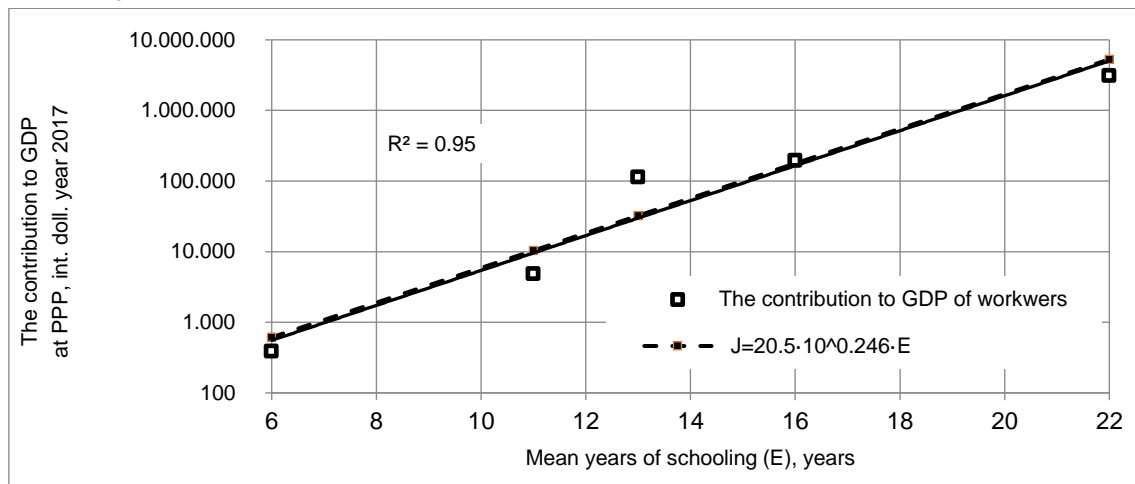
Source: Orekhov et al. (2019)

It is possible to check the formula (10), for example, by calculating the GDP/C for the United States in 2017. The calculated data are indicated in Table 1, which shows the shares of employees with different training periods and their specific contribution to GDP/C at PPP using the formula (10). The training duration of 22 years roughly corresponds to the qualification of research and development employees.

Table 1. Contribution to GDP/C USA employees with various degrees in 2017

Education, years	6	11	13	16	22	Total
Percentage of employees, %	9.4	44.3	11	34.4	0.88	100
Contribution to GDP of one employee, k$	0.61	10.4	32.3	176.9	5,294	
Specific contribution to GDP/C of employees of the same educational level, k$	0.06	4.61	3.56	60.9	46.6	115.7

Source: Search data.

The specific contribution of all employees to GDP/C for the year is 115.7 K$. The number of employees in the USA in 2017 is 50.3% (THE WORLD BANK, 2021a) of the population, so the estimated GDP/ C = 58.2 k$. The real value of GDPC was 60.3 k$. The margin of error is 3.5%, which is acceptable for such predictive calculations.

In principle, all three expressions (8) – (10) indicate an exponential increase in GDP, depending on the level of education of employees. This allows drawing a very important conclusion about which educational strategy is more profitable to follow with the limited resources that can be allocated to education, in terms of GDP growth.

If the costs for one year for secondary and higher education do not differ very much, then it is more profitable to quickly develop a contingent of specialists with higher education who will ensure the rapid economic growth of countries. According to statistics for 38 OECD countries and 9 partner countries (Table 2) (AGRANOVICH; ERMACHKOVA; SELIVERSTOVA, 2019), the

cost of tertiary education per year is approximately twice as much as for secondary education.

Table 2. The ratio of the cost of training at the tertiary and secondary education

GDP/C, K$	More than 41	21 – 41	Russia	Less than 21
Secondary education, K$	11.9	7.5	4.2	3.1
Tertiary education, K$	21.4	10.7	8.5	6.6
The ratio of expenses for tertiary and secondary education	1.8	1.4	2.0	2.1

Source: Search data.

To assess the impact of educational inequality on the potential growth of the economy, consider three models of the structure of education in the country. We will assume that an average of 60 K$ of investment is allocated for the education of each student in the country, and training in secondary education costs 5 K$, and in tertiary education – 10 K$ per year. Therewith, we will assume that this investment structure does not change over time. The three options for allocating such investments to different levels of education for 100 students are presented in Table 3. In the first option, all students receive an equal upper secondary education lasting 12 years, in the second option, 20% receive Bachelor-level tertiary education, and in the third, 20% receive lower upper secondary education, but due to this, 20% receives Master-level tertiary education. The cost of training all students in each of the options is the same.

If we apply formula (10) to each of the groups of employees and take into account that employees make up 50% of the population, we get the GDP/C value for all three options, which are presented in Table 3. It can be seen that in comparison with option 1, GDP/C is about twice as much in option 2, and in the third option – 6 times more.

Table 3. Comparison of three models for the distribution of investment in education

1	Indicator	Option 1	Option 2		Option 3		
2	Number of students	100	20	80	20	60	20
3	Number of years of study	12	16	10	18	10	6
4	Cost of full training, K$	6,000	2,000	4,000	2,400	3,000	600
5	Contribution to GDP of 1 graduate per year, K$	18.4	176.9	5.9	549	5.9	0.6
6	Realizable value of GDP/C, K$	9.2	20.1		56.8		

Source: Search data.

Such a large difference can certainly be attractive to developing countries. This opportunity can be used to good advantage not only by the state but also by companies that want some of the employees to be more qualified. Wealthy individuals also want to give their children a better education or raise their education to earn a bigger salary.

This strategy is not inclusive. It is an important reason that the good wishes to reduce poverty and improve the education of the general population do not always find practical support. However, the concept of inclusive development has recently become increasingly popular. It is important to understand what factors are driving such changes.

It should be noted that the factor of influence of educational inequality also acts at the international level. Moreover, it is much easier to implement it there. If educational inequality within a country can lead to social conflicts and this limits the opportunities for its use, then it is not difficult to isolate residents of other states, including with the use of the armed forces. The international practice of the last centuries shows that this is often the case.

The balance of forces for and against inclusive development
The educational leverage of inequality generated by the educational exponent is far from the only factor that opposes inclusive development. The desire to possess power and wealth also contributes to the negative side of social development. The excessive concentration of wealth in the hands of the wealthiest 1 percent is particularly significant. However, the international community does not have the strength to resist this process. Thus, the forces of resistance to inclusive development are very large.

Next, we will use the concept of the field of forces introduced by Kurt Lewin to analyze the possibilities of making changes (LEWIN, 1935, 1951). To make a change, it is necessary to have a sufficiently powerful force, because, in a state of equilibrium of the situation in support of maintaining the status quo, there are deterrent forces and their nature and strength must be understood. Each force is a social group that has an impact on the situation and the corresponding financial, political, information, and other resources. To make a change, it is necessary to ensure that the driving forces take precedence over the restraining ones. In addition, it is necessary to successfully carry out the process of change itself, which, in the classical model of K. Lewin includes: defrosting, changing, and freezing the situation.

We noted above the impact of the growth of knowledge and the number of humanity on the average labor productivity among the positive driving forces. However, these factors rarely appear in the works of the classics of inclusive development. Accounting for knowledge, in particular, as components of intellectual capital, is used at the corporate level (NONAKA, TAKEUCHI, 1995; ROOS, ROOS, 1997; ALBERT, BRADLEY, 1996; BROOKING, 1996; DAVENPORT, PRUSSAK, 1997), but is almost not used at the level of a systematic understanding of human development. The growth of the human population, as a rule, is considered a negative factor that negatively affects sustainable development.

It seems that international competition has now become one of the most significant forces of inclusive development. There are four major economies in the world: the United States, the European Union, China, and India. In addition, there are other fairly large economies: Japan, Russia, Indonesia, Mexico, and Turkey. Each of these countries seeks to take a more significant place in the economic, political, scientific, information, technological, and military spheres. Therefore, they strive to make the most of their human capital and develop it through education, health care, and other factors. After the exhaustion of traditional resources for the development of human capital, it was the turn of inclusive ones, primarily in developed countries.

Of course, these are not all factors. For example, the appalling poverty of several African countries causes the international community to seek to help them (UN GENERAL ASSEMBLY RESOLUTION, 2015; ALVAREDO et al., 2018), although this process is moving very slowly and more than 600 million people still live in extreme income poverty (UNITED NATIONS DEVELOPMENT PROGRAMME, n.d., p. 7). There are also specific problems in several countries that can be solved through an inclusive approach, for example, the inclusion of migrants who find themselves in Europe (EUROPEAN COMMISSION, 2014, 2019).

It should be noted that educational differentiation plays a negative role, mainly in developing countries, which do not have the opportunity to invest enough in education. This factor plays a less negative role in developed countries. It should be noted that some of the above forces are negative or positive in one case, and vice versa in the other. Thus, the desire to acquire wealth and run a large business is a motivating factor and, to a limited extent, plays a positive role. Similarly, the desire to be a leader and have the appropriate power can play a positive role (ILINA et al., 2016; DUSENKO et al., 2016; KRYUKOVA et al., 2018; DROBYSHEV, KAUROVA, KRYUKOVA, 2017; DROBYSHEV, MALOLETKO, KRYUKOVA, 2017).

To assess the power of the main actors, Table 4 shows their characteristics from the point of view of the authors: the name of the force, the interested parties, the benefits they receive, the amount of benefit, the action that the interested party performs and the assessment of the power of the force.

Table 4. Comparing the benefits and drivers of inclusive transformation

Power	The main benefit	Stakeholders	The stakeholders' action	The value of the benefit	Activity of force
Deterrent forces					
Educational differentiation	The growth of the power of the state	States	Differentiation of education	High	Average
	Qualification of specialists	Companies		Average	Average
	Higher salary	People		Average	Average
Digitalization	Increase in labor productivity	Companies	Introduction of IT, replacing the work of people	Average	Average
The desire to have power	Power over other people	States	Seizing power	High	High
Increasing wealth	Increasing wealth	Financial elites	Wealth accumulation	High	High
Driving forces					
International competition	Leadership in the world	States	Increasing the strength of the economy	High	High
Universal education	Sustainable economic growth	States	Free education	High	Average
Elimination of social conflicts	Sustainable development	States	Alignment of imbalances	Average	Average
Supporting the growth of explicit knowledge	Universal growth of labor productivity	UNO	The rise of education in poor countries	High	Low
		Civil society			
Developing inclusive markets	Sustainable development	States, civil society	Employment of vulnerable groups of citizens	Average	Average
Security and quality of life	Favorable living conditions	People	Elections of power structures	Average	Low
Cheap labor	Savings on labor costs	Business	Moving the business to poor countries	High	High
The decision of international bodies	World progress	Global community	Decision-making	Low	Low

Source: Search data.

The first four forces counteract inclusive change or create inequality themselves. It can be seen that they all have high or medium strength.

A generalized diagram of the main forces that promote and counteract inclusive transformation is presented in Figure 6. Among the factors that promote inclusive development, most of them are of medium or low strength. Only international competition can be characterized as having high strength.

Therewith, this factor has a positive characteristic only concerning competition between the largest economies. In their relations with weaker economies, they may exhibit the negative characteristics common to forces seeking to acquire power and wealth. Table 4 and Figure 6, far from all the forces acting in this field are presented. Thus, globalization can play a positive role in terms of the economic development of states as a whole, and a negative role concerning individual groups of the population.

Figure 6. The force field of inclusive transformation
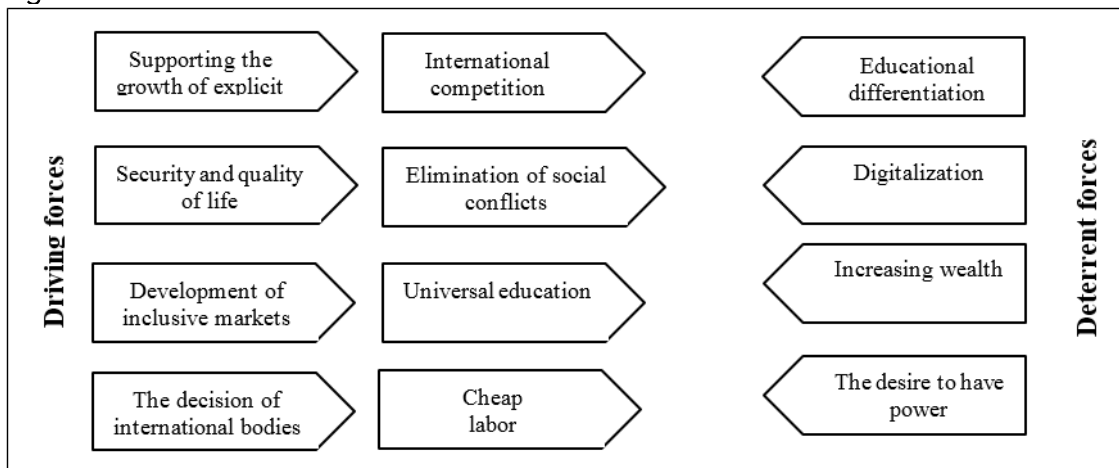
Source: Search data.

It is characteristic that among the forces that promote inclusive development, most are those that operate within countries and few that have an impact at the international level, especially concerning the poorest countries. These include decisions of international bodies, cheap labor, which contributes to the transfer of production to underdeveloped countries, as well as the growth factor of a single explicit knowledge of humanity.

DISCUSSION

The significance of the results of the article for further research

The paper shows that humanity is developing as a complex synergistic system, in which knowledge and education play the most important role, and also defines the main quantitative dependencies of the influence of explicit knowledge and the number of years of education on the growth of GDP per capita. It follows that inclusive transformation should primarily be aimed at involving as many people as possible in the creation of implicit knowledge and the acquisition of implicit knowledge through education. This two-pronged process is a meaningful mainstream of inclusive transformation.

The main obstacles to these two areas of inclusive development have been also identified. Thus, the universal impact of the growth of explicit knowledge on global labor productivity is fundamentally unquestionable. However, public opinion and elites do not realize that the potential contribution of the still underdeveloped countries to the growth of labor productivity around the world can bring significant benefits to the developed countries. Therefore, the process of involving the entire world community in the creation of knowledge and its universal availability is not active enough. The main forces contributing to this inhibition are the desire to have power and wealth here and now.

The main force opposing the development of education is the factor of the profitability of educational differentiation for the growth of GDP per capita since specialists who have received the highest qualifications contribute significantly more to GDP than those who have a low educational level. Accordingly, the countries that were able to provide a high level of education to their citizens have a much larger GDP per capita and resources for further improving the educational level of the population and the growth of human capital. The private interest of citizens, companies, and states is a very powerful force supporting educational differentiation. It is counteracted by the relatively weak force of the development of universal education, including higher education. In addition, education alone cannot produce public goods, but only increases the value of human capital, which can only work effectively if the appropriate means of production and access to markets are available. The power of universal education is supported by international competition, which forces states to increase their human capital.

A predictive look into the future (HAWKSWORTH, AUDINO, CLARRY, 2017) shows that the largest countries such as China, India, and others have taken the path of a constant increase

in the level of education of the population and, accordingly, their GDP and GDP per capita are growing. As a result, in this century, they are likely to become world leaders in economic power, and consequently in the creation of knowledge. Thus, the factor of inclusive development will be developed in the largest developing economies. However, inclusive development will not always be successful in countries with small populations.

Another direction of inclusive development is related to the fact that wealthy countries and citizens strive to have a high quality of life and protection from special groups of people who can create social conflicts and hinder sustainable development. In the future, it will be useful to study in more detail the different categories of people who feel inequality. Therewith, it is important to take into account the extent to which this inequality can be conflict-prone, what negative consequences it can lead to, and what opportunities there are to smooth out the imbalances that caused the tension.

This paper considers a fairly large number of forces that contribute to inclusive change, but it is not a fact that these are all major forces, so more research is needed in the future to systematically identify other forces. Particular attention should be paid to the forces that make it possible to implement inclusive changes at the interstate level since they are relatively few among the factors considered. The issue of increasing the accuracy of measuring the magnitude of forces is relevant. On the one hand, this can be done by interviewing a wide range of experts. On the other hand, it is possible to study the implementation of decisions already taken by the United Nations and other international organizations. It is also relevant to study the forces of the inclusive field operating within specific states.

In this paper, GDP at PPP or GDP per capita was used as the main indicator of economic growth. However, the current trend is to move towards socially-oriented development indicators. If such indicators are used as criteria for assessing the benefits and power of forces (Table 4), the understanding of development trends can change significantly. Such a view makes us wonder what "benefit" and "activity of force" are. Perhaps, along this path, approaches can be found to refine the measurement of the magnitude of forces.

The study showed that the field of forces of inclusive transformation is quite complex and it is not clear how to unbalance it and ensure the implementation of inclusive changes. There are reasons to apply the cognitive modeling methodology to it in full, including considering dynamic changes. The forces presented here do not exhaust all the factors considered, for example, in the works of D. Acemoglu, M. Spence, and others. If we increase the number of factors being considered, then the problem will become even more difficult to solve. In this case, to solve it, it is necessary to identify the most strongly influencing factors and study in which direction the development of the entire system will take place.

Thus, in the future, it is necessary to pay attention to the following main areas of research:

- to study the experience of implementing inclusive changes in countries that have succeeded in doing so,
- to identify the maximum number of forces of inclusive development,
- to develop methods to improve the accuracy of force estimation,
- to conduct cognitive modeling of the dynamics of the force field,
- to identify the forces that determine the behavior of the entire system,
- to find the possibilities of bringing the force field out of balance.

The results of the work can be used in the development of inclusive change projects, as well as in the development of growth strategy at the level of countries and individual regions.

CONCLUSION

Studies of key factors, the transformation of which using an inclusive approach, allows through the development of human capital positively influencing the economic dynamics, have been conducted. Several important forces that promote and counteract inclusive development have been identified. It has been shown that humanity develops as a single system that creates and uses explicit knowledge. Therewith, the average labor productivity in

the world, measured by GDP per employee, is directly proportional to the amount of explicit knowledge of humanity Z, determined through the volume of books in the largest libraries in the world, and associated with the number of people in the world by a power dependence of the type $Z = K \cdot N^{1,27}$. Inclusive transformations that increase the proportion of people who produce and use knowledge lead to an increase in explicit knowledge and the average productivity of the world.

The contribution of employees to GDP depends exponentially on the Mean years of Schooling, which greatly differentiates the productivity and earnings of employees with different education. The concentration of educational investments on a limited proportion of citizens in developing countries can significantly increase GDP per capita. This factor is at the heart of one of the main forces opposing the implementation of inclusive transformations in practice, in conditions of limited investment opportunities in education.

The analysis of the field of forces shows that the factors that counteract inclusive socio-economic changes (educational differentiation, digitalization, the desire to have wealth and power) are highly powerful. The forces that promote inclusive change are less powerful, but more numerous, which makes it possible to implement positive changes. International competition between the major economies creates challenges that encourage them to implement inclusive changes, which contributes to the development of human capital and economic growth of these countries. This creates one of the most powerful forces for inclusive transformation.

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Benefits and drivers of inclusive human capital development

Benefícios e impulsionadores do desenvolvimento inclusivo do capital humano

Beneficios e impulsores del desarrollo inclusivo del capital humano

Resumo

O trabalho tem como objetivo analisar os benefícios e os impulsionadores da transformação econômica através do desenvolvimento do capital humano utilizando princípios inclusivos. O estudo é a continuação de uma série de trabalhos sobre a modelagem do sistema de atividade laboral utilizando os fatores do conhecimento, da educação e do capital humano. A metodologia da pesquisa inclui tanto estudos quantitativos sobre o impacto do conhecimento e da educação na dinâmica econômica, quanto estudos qualitativos dos benefícios e forças que promovem e neutralizam mudanças inclusivas frutíferas. De acordo com a análise do campo das forças, os fatores que neutralizam as mudanças socioeconômicas inclusivas (diferenciação educacional, desejo de ter riqueza e poder) têm, em geral, alta força. As forças que contribuem para a mudança são relativamente menos poderosas, mas mais numerosas, o que permite contar com a implementação bem-sucedida de mudanças positivas inclusivas.

Palavras-chave: Economia inclusiva. Desenvolvimento sustentável. Dinâmica econômica. Conhecimento explícito. PIB.

Abstract

The paper aims to analyze the benefits and drivers of economic transformation through the development of human capital using inclusive principles. The study is a continuation of a series of works on modeling the system of labor activity using the factors of knowledge, education, and human capital. The research methodology includes both quantitative studies of the impact of knowledge and education on economic dynamics, and qualitative studies of the benefits and forces that promote and counteract fruitful inclusive changes. According to the analysis of the field of forces, the factors that counteract inclusive socio-economic changes (educational differentiation, the desire to have wealth and power) have, in general, high strength. The forces that contribute to change are relatively less powerful, but more numerous, which allows counting on the successful implementation of positive inclusive changes.

Keywords: Inclusive economy. Sustainable development. Economic dynamics. Explicit knowledge. GDP.

Resumen

El trabajo tiene como objetivo analizar los beneficios e impulsores de la transformación económica a través del desarrollo del capital humano utilizando principios inclusivos. El estudio es una continuación de una serie de trabajos sobre el modelado del sistema de actividad laboral utilizando los factores del conocimiento, la educación y el capital humano. La metodología de investigación incluye tanto estudios cuantitativos del impacto del conocimiento y la educación en la dinámica económica, como estudios cualitativos de los beneficios y fuerzas que promueven y contrarrestan cambios inclusivos fructíferos. Según el análisis del campo de fuerzas, los factores que contrarrestan los cambios socioeconómicos inclusivos (diferenciación educativa, deseo de tener riqueza y poder) tienen, en general, una alta fuerza. Las fuerzas que contribuyen al cambio son relativamente menos poderosas, pero más numerosas, lo que permite contar con la implementación exitosa de cambios inclusivos positivos.

Palabras-clave: Economía inclusiva. Desarrollo sostenible. Dinámica económica. Conocimiento explícito. PIB.