Investment in human capital and its multiplier effect

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Abstract: The progress of the developed countries contributed to the formation of the new economy - the economy of knowledge, innovation, new technologies and business ventures. Human capital represents the foundation of this new economy. Changing role of human capital, transforming it from the element of the cost into the main productive and social element of the development has led to the necessity of forming a new paradigm of economic growth. In the process of the transition from the industrial to the informational paradigm occurs the socio-economic relationships change, covering all spheres of human activity. Thus through the human capital is determined the efficiency and competitiveness of subjects at different levels. In the new paradigm of the global community development, human capital has a crucial place in national wealth (about 80% in developed countries).

Research on human capital aimed both the concept itself and measuring the level of investment in human capital and the link between the latter and economic growth. Summarizing the basic approaches of the theory of human capital we can say: human capital represents a measure of individual skills and qualities made from investments which, used effectively, leads to increasing the productivity and the income.

These capacities and qualities of individuals have contributed to the occurrence and development of the new economy, have opened new horizons in the perception of economic phenomenon, based on innovative ideas that give rise to innovational economy. The particularities of the human capital in innovational economy have multiplicative value which consists of the fact that after the production process, the newly created value from the output exceeds its input. As a result, the author defines human capital as all social-economic relations regarding the formation and accumulation of knowledge with an multiplicative innovational effect.

Key words: human capital, investment, human capital accumulation, multiplier effect, growth

1. Introduction.

The new global trends in sustainable development have led us to believe that innovation plays an important role, being able to provide the technical and technological renewal of production, to achieve competitive production, to develop the service sector, leading to the formation of innovative economy.

Through this scientific approach it was revealed the correlation between sustainable economic development and innovation, mainly driven by the link between these two concepts, namely the human capital through its component of innovation.

Our study aims to demonstrate the role of human capital in economic growth through its innovative multiplicative effect.

2. Theoretical background

Human capital theory has shown throughout the time that there are many socio-economic factors (education, health, government policies, etc.), contributing overwhelmingly to argue its role in the economic growth phenomenon.

The evolution of human capital theory starting from Jacob Mincer's ideas aims to demonstrate the role that education acquires in economic life, respectively which it has in economic growth. In this regard, Edward Denison [1] has shown empirically that since 1929, until 1982, the annual growth rate of national income per inhabitant in the U.S. was a percentage of 1.55%. This increase was ensured at a rate of 0.38% from the expense of quantitative costs for labor and capital and 1.17% at the expense of productivity factors.

According to calculations, first among qualitative factors is the progress in knowledge, that is 0.68%.
New economic growth theory by Robert E. Lucas [2] and Hirofumi Uzawa's model [3] finds also a strong correlation between productivity growth and investment in human capital and not in the physical capital. In the long term, sustained economic growth is possible only if it is possible to increase without limit the human capital. In Lucas’s view, the term human capital is used as “knowledge” rather than skills acquired through education, so occurring the isolation of the effect of human capital from the one of the innate abilities and from the one of the image created by education. This has been also revealed by scientists Joshua Angrist and Alan Kreuger through studies, in order to establish the effects on the salaries innate abilities, taking into consideration only the effect of schooling [5].

The relationship human capital - economic growth initiated by Robert M. Solow (1957) [6] and then developed by Edward Denison (1967) [1] and James Maddison (2001), gives a greater importance to the residual factors (technical progress, education, health) in explaining economic growth performances. In the long term this economic growth is possible only if there is unlimited growth of the human capital [7]. Solow's model is important because it demonstrates that whatever is the starting point on a growth trajectory, there is a equally balanced growth (Jula, D. et al, 1999, p.34).

The economists Jean Jacques Carre, Paul Dubois and Edmond Malinvaud [8] concluded that between 1950-1975, the economic growth registered in France was due to accelerating contribution of the exogenous growth. This latter, known as technical progress, reflects the improvement of scientific knowledge and innovation and efficiency measures in the use of the means of production,especially of the workforce. Such theoretical progress and empirical studies gradually fulfill the conditions to identify the role of human capital in economic growth.

In a study conducted by Richard Crawford [9] it was shown that 70% of U.S. companies resources, represents human capital investments. Roger Ibbotson and Gary Brinson [10] have the credit for trying to quantify the contribution of the human capital to increase social welfare. Therefore they have shown that, in 1989, the welfare of the developed countries was provided up to 80% by the human capital as compared with the United Kingdom where the human capital was providing half the welfare of the country in 1946. Birsdall Nancy, Thomas Pinckney, and Richard Sabot have studied the relationship between economic growth and education in countries with abundant natural resources.

Nancy Birsdall, Thomas Pinckney, and Richard Sabot have studied the relationship between economic growth and education in countries with abundant natural resources. The conclusion they reached is that these countries spend less on education than other countries. The effects of education are reflected in increased productivity in facilitating the technological progress or the acquisition of technological information and salary increases [11]. Also for OECD countries have been carried out studies by researchers as Nancy Birsdall [12], Angel de la Fuente [13], S. Scarpeta [14], and their conclusions are limited to the fact that educational level is, potentially, a decisive - key of the economic growth. On the other hand, the new theories specify that the basic determinant of investment (in human capital or physical) is innovation in economy motivated by the profit increase.

3. Problem solution

3.1. Hypotheses of the research

An extended period in the history of economic theory, the growth phenomenon was seen only as a problematic and not as a theory itself. [15] The direct correlation of the human capital with the phenomenon of economic growth to human capital theory.

The human capital theory did not always managed to meet the expectations of solving the problems in the field. One such issue is the fact that human capital theory elements can only be used to scale manufacturing processes for differentiating compensation per qualification levels [16]. According to the author there are some shortcomings of the theory of human capital, namely: human capital theory is limited to the study of functional dependencies, namely the neoclassical paradigm unilateral reflecting reality. Human capital theory followers did not reveal the formal character of the neoclassical model. Human capital theory is specific to the microeconomic analysis, according to which increasing human capital provides proportional increase in revenues. People with ideas, talent, with contribution to cultural development were not always properly assessed.
3.2. Means and tools of research

The methodological basis of research knowledge is dialectical method, device and philosophical categorical general systems theory, comparative analysis method.

3.3. Research results and interpretation

If Thomas Davenport's views on human capital refers to the value that is the investment in human capital for its owner, that people are investors and owners of human capital: "human capital means all intangible assets that people bring to their workplace” [17], current theory of human capital requires the evaluation of the human capital not only in terms investment volume in it, but also in terms of individual stock accumulation by the human capital. Reproduction and human capital accumulation are much easier in developed societies based on knowledge. Yet from another approach and political freedom according to A. Sen, is another key element of the development being favorable to growth. Democracy, through social dialogue and education, arouses, also, awakening of the collective consciousness and helps in the development of both social structures and individual behavior. Therefore, is obvious that human capital is the central pivot in the development process and growth through the social and economic relations and investment in it.

Among the human capital theory concepts it is necessary to highlight the categories that are recognized by the economists as direct investments (expenses): for education, including payment for medical services, for changing jobs and their living expenses and alternatives: sacrificed salary, sacrificed product as a result of long-term education or prolonged illness. Having regard to human capital components we can establish the types of investments and the interdependence between them(Figure 1).

<table>
<thead>
<tr>
<th>Human capital components</th>
<th>Types of investment in human capital</th>
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<tbody>
<tr>
<td>Capital health and living standards</td>
<td>Investment in health</td>
</tr>
<tr>
<td>Knowledge capital (education)</td>
<td>Investment in education</td>
</tr>
<tr>
<td>Specialists of preparing capital in production</td>
<td>Investment in workplace training</td>
</tr>
<tr>
<td>Scientific capital</td>
<td>Investment in developing scientific and intellectual development</td>
</tr>
<tr>
<td>Cultural capital</td>
<td>Investment in education (development and self)</td>
</tr>
<tr>
<td>Availability for of information</td>
<td>Important economic investments in information search</td>
</tr>
</tbody>
</table>

Fig.1. Classification of investments in human capital structure correlation

Source: developed by author

The education of the individual during formal education and throughout life involves the allocation of some financial resources as investments in education and training in the workplace. In a similar way providing a scientific capital, culturally causes expenses for the scientific research and intellectual development as well as investment on development and individual self-development. Therefore we can notice that the investment in human capital not only includes expenditure on education and professional adjustment, but also those for healthcare costs, for searching a job and the efforts made by families before entering the school system and afterwards . These expenses can be seen both as an investment and as a consumption, but human capital in general has been treated as an investment, considering that the investment in education and health, generates long-term effects that allow the individual to achieve a growth of the revenue and in a macroeconomical level to lead to an economical growth.

The main factors which determine the investments in human capital are: the general state of the economy, differences that exist in...
the distribution of income, length and stability of income flows, costs, marginal revenue of investment in human capital and the recovery rate of the investment in the human capital, annuity skill (Additional revenues due to special skills that an individual has). In terms of these factors, according to Olaru S., in “The quality of educational services - imperative for the competitive education in the European plan" investments in human capital should be channeled so as to be in accordance with the employment policy and the labor force nationwide. The perception of the changes occurred in the structure of the labor resources and their propagated effects on investment in human capital took place on the background of the restriction of the activity in certain fields. Therefore, the occurrence of the unemployment and the affection by that to some socio-professional categories led to rapid changes mainly in the structure of labor demand and generating significant changes in the pattern of investment in human capital. Investment in human capital can be made both by the individual (family) and by the Company and the society through the state. The investment decision in human capital must be reasonable, deeply analyzing both costs and benefits, thus drawing, the cost – benefit method. Investment in human capital involve benefit for the individual, company and society.

Investing in human capital involves first of all the start of a process of accumulation of the human capital.

Developing innovative society based on knowledge, innovations, the positive acceptance of new ideas, systems and technologies as well as their realization in various spheres of economic activity is based on two models of accumulation closely interlinked:

1) the knowledge accumulation, skills, acquirements, abilities experience, culture,

2) material accumulation.

In our analysis we approach these accruals in the perspective of the immaterial ones. Immateral accumulations by their nature of influence on the development of human social life, have a major priority. These affect all aspects of social life, by ensuring the continuity of the new scientific and technical knowledge, innovations, Know-how, worker’s high professional qualification and the level of culture. The faster spread innovative knowledge, the more those are found in professional-qualitative potential of the workers. The higher the level of scientific production, the more efficient is the result of the investment in human capital. Analyzing this form of accumulation in developed countries in the second half of the twentieth century, we should mention that the most important and greatest objective progresses for reproduction conditions were madein the immaterial sphere.

Development priority changes between 1960-1990 have found expression in multilateral orientation of human development and in satisfying various consumer demands. Was not until in the 60s when the investments in human capital was equal with the investments in the material spere, and over time they have exceeded the latter. Thus in U.S. expenditures on education, health and social security in 1970 have exceeded global material investments almost twice, in 1990 more than three times, and in 2000 this difference being approximately four times. In the second stage of enriching social life of human beeinng, from the mid 70, s. XX, in developed countries there was a new feature of the economic growth. The most important source of growth became the consumption (science and education) in exchange for production. Human capital accumulation means thus, primarily, transforming the consumption into production.

Consumption in the innovational economy, unlike production activity becomes producer’s consumption, thereby is in unity with the production, and therefore with the accumulation. For these reasons, human capital accumulation coincides with both production and consumption.

As a unit of needs and capabilities, human capital is formed both in production and consumption, but production capacities are initially created by consumption and is achieved in production. Consumption needs, conversely, are created in social production and satisfied by consumption. For these reasons, needs and capacities like human capital components, are presented at the same time both as means (economic resources) and as purposes (final results) of the development of the innovative economy on the market [18]. The above mentioned argues the need to correct the traditional approaches of interaction processes in production and consumption,
borders and mechanisms of functioning of the economic system [19]. For these reasons we mention two major drawbacks:

1. Human capital as a stock of capacities is initially created in the consumption process, leading to new parameters of the innovational economic system goal and means of achieving them.

2. Human capital is not carried out only in the sphere of consumption but also in production because, in the economic literature, in the terms of exposure in essence of the human capital, is ignored the needs and innovations stock component, which is formed during the production process.

Such an approach of objectives and fundamental problem of innovational economy, of operating mechanisms conflicts with utilitarian ideology which predominates today in economic science, according to which the individual’s production capacities are studied just as economic resources and not as objectives of the economic development. Needs, conversely, do not perceive as economic resources, giving rise to the ability, initiative and achievement of various innovations.

We can thus conclude that human capital accumulation is transforming the newly created substance in human capital, as a stock of needs and capacities. Dual nature of human capital as a unity of needs and capacities growth processes reflects the particularities of science and education as basic economic and organizational forms. Science and education, through the link between production and consumption, create new forces of economic activity, new necessities and capacities but also their role in human capital reproduction essentially differs. This differentiation is the basis for the distinction between individual and total accumulation of human capital.

So the science, which produces innovation, new methods for developing the social life, labor and consumption, it transforms people, make them carriers of new capacities and of consumption. Role of science in human capital reproduction cycle is to achieve social welfare with new consumption demands and possibilities. This is achieved only for the purpose of accumulation of knowledge, of investment in human capital. Thus the role of intellectual activity in the reproductive process of human capital is the reverse action of consumption over production.

Accumulation of knowledge, investment in human capital directly causes the growth and development, reflected in the human development index (HDI) and GDP / capita. Economic theory often showed a direct relationship between growth and development (Table 1).

Table 1. Human Development Index and GDP / groups of countries according to the degree of development (2012)

<table>
<thead>
<tr>
<th>Human Development Index groups</th>
<th>Gross national income(GNI) per capita (2012)</th>
<th>Human Development Index(HDI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very high human development</td>
<td>33384</td>
<td>0.905</td>
</tr>
<tr>
<td>High human development</td>
<td>11579</td>
<td>0.757</td>
</tr>
<tr>
<td>Medium human development</td>
<td>5479</td>
<td>0.639</td>
</tr>
<tr>
<td>Low human development</td>
<td>1651</td>
<td>0.466</td>
</tr>
</tbody>
</table>

Source: Human Development Report 2013, p. 159

The economic growth is considered to be the source of the economic development, based on human capital. This correlation can be explained, besides the fact that GDP / capita. is part of the HDI, with a double causality: the growth facilitates the development, and the development facilitates the growth. In this respect growth represents a source of development through various mechanisms: rising living standards and material wealth, increasing health expenditure, those with education, productivity and technical progress. But the development generates growth also through the mechanism of human capital. A healthier workforce, better formed is more productive in a modern economy based on knowledge, where human capital accumulation is much easier.

But at the same time there may be growth without development. In World Report on Human Development 2013 is presented eloquently this situation (Table 2).
Table 2. Human Development Index and its components by country (2012)

<table>
<thead>
<tr>
<th>Country</th>
<th>Gross national income(GNI)/per capita (2005 PPP$)</th>
<th>Human Development Index(HDI)</th>
<th>GNI per capita rank minus HDI rank</th>
<th>Non income HDI Value 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norway</td>
<td>48688</td>
<td>0.955</td>
<td>1</td>
<td>0.977</td>
</tr>
<tr>
<td>Kuwait</td>
<td>52793</td>
<td>0.790</td>
<td>-51</td>
<td>0.730</td>
</tr>
<tr>
<td>Botswana</td>
<td>13102</td>
<td>0.634</td>
<td>-55</td>
<td>0.596</td>
</tr>
</tbody>
</table>

Source: Human Development Report 2013, p. 157-159

High levels of inequality can also reduce life expectancy and educational attainment (e.g. Filipino workers in Saudi Arabia). Health system level is also a determining factor. Inequalities in relationships between men/women reduce the level of education of women and thus influence human development index (HDI). Finally, armed conflict, epidemics can inevitably lead to poverty. In this context, with non monetary HDI data, the correlation between income growth and improve health and education is low.

Argumenting the role the role played by the human capital in economic growth and development, and the importance of investment in human capital and its accumulation leads us to the assertion according to which basic feature of human capital is its multiplier effect. Dissemination of the effects that it generates in the chain at different levels demonstrates its ability of sequential multiplication.

If at macroeconomic level, Keynesian model is used mainly in the analysis of macroeconomic influence on national income and expenditure flows [20] and multifactorial analysis of human capital can provide information on material and immaterial national flows with direct innovational effects.

The direct involvement of human capital in longitudinal economic development processes leads to effects with major implications on economic phenomenon.

Thus human capital approach, as independent element make the connection with particularities that have major contribution to the development of the economic and social processes, like health, skills, knowledge, intellectual property, intellectual ability and level of culture. Each of these particularities generates effects influencing the processes taking place in the economy.

In terms of labor demand and human capital there is a division of the effects the effects generated by this in the households, qualifications, within the state as well as noncommercial organizations.

Human capital evaluation process is generator of benefits in the sense of the positive impact that it generates within the documentations, competitions, attestations and selections. This process incites to performance and to overcome the limits of human capital.

Investment in human capital, as we have shown amplify the effect of human capital through the educational industry, health, retraining and improvement and creativity, opening innovational horizons.

The inclusion of human capital in business stimulates the processes of organizing work, business, creative activity and operations of records of intangible assets.

Not the least, the share of the business revenue determines actions with effects to increase wages royalties and also participation at the capital and profit.

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Not the least, the share of the business revenue determines actions with effects to increase wages royalties and also participation at the capital and profit. Supporting this assertion is made in the basis of using the innovative capacity index of human capital I
4. Conclusions

Global processes that occur at the onset of the third millennium related to the acceleration of the tertiary sector, the individualized production, intellectualization of human activity, creating an efficient informational system, training a new motivational mechanism etc. represents the premises of forming a viable post-industrial economy that requires creative interpretations by the economic science under the spectrum of global economic crisis that is manifested since 2008. Changing the role of the individual, transforming his intellect into a decisive factor of the social progress, argues the necessity of a new paradigm of development. Its essence lies in the transition to a new level of socialization, changing development priorities as well as transferring from the technocratic approach to the anthropocentric one, oriented towards human needs and capabilities. Needs and capabilities in innovational economy are interdependent. Such capabilities are studied only as resources, and not as purposes, and meeting the needs, inversely. This state of facts has the consequence modifying the structure of human capital and changing the vision on it. Human capital, in the innovational economy represent the totality of socio-economic relations on the formation and accumulation of knowledge with innovational multiplicative effect, which consists in that after the production process, newly created value exceeds to output its value to input. Innovational human capital component represent the totality of intellectual capacities of the worker to generate and the achievement of new knowledge, having both physical and intellectual capabilities of the worker. We consider that innovational multiplicative effect of human capital is not confined to the analysis undertaken by us, and any other vision will contribute to substantiating this feature.

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