Human capital contribution into innovation progress: world experience

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Abstract. The article deals with the evaluation of different approaches to the human capital notion, the features of state policy in a number of developing and developed states based on foreign and home research. The approaches are aimed at stimulating human capital in order to stimulate the innovation activity. The article shows the use of concrete program measures of stimulating the human capital development by the innovation capital leaders aimed at stimulating the human capital to encourage innovation progress (benefits, financial support, measures of effective interaction between science and production). Particular attention is paid to the experience of some developing countries (china, India, South Korea) in preventing the «brain outflow» and in attracting both international and home 'intelligence" into the national economy (remigration).
[Kasaeva T.V., Kiseleva N.N., Rud N.Y. **Human capital contribution into innovation progress: world experience.** *Life Sci J* 2014;11(11):626-629] (ISSN:1097-8135). http://www.lifesciencesite.com. 114

Keywords: human capital, human capital theory, investment into human capital, innovations, industrial parks, business incubators, start-up-companies, reemigration

Introduction

The capitalization of various economic spheres has affected the sphere of human society. The 21st century marked the shift from "industrial society" when the material (physical) capital dominates to the "postindustrial society" in which nonmaterial resources dominate (information, knowledge). Production of nonmaterial benefits directly affecting the public thinking has turned into a powerful material force, the factor of achieving a new qualitative basis of production forces. Because of that the leading progress factor in each modern state becomes the human capital. This circumstance is due to the fact that "evolution of human capital favors social prosperity diminishes joblessness and strengthens social links in the society" [1].

Main part

The analysis of civilization and country progress manifests that, since the medieval age, the human capital is a leading evolution factor [2]. The west European civilization in historical progress has won in the global civilization competition over considerably more ancient cultures and civilizations (for instance, china produced one third of world gross home product until the early 18th century) exactly due to the considerable human capital growth - for instance, Western Europe overcame China and India in public literacy by the 18th century. The European investments into education in science in the 18th century enabled western civilizations to progress faster in the 9th and 20t centuries.

The fact how human capital influences the economic growth is exemplified by Japan always having a high level of human capital development. For instance, the Japanese adult population in 1913 was on the average taught during 5.4 years, in Italy during 4.8 years, in the USA during 8,3 years; re average lifespan in Japan was 51 years (at par with the USA and Europe). For comparison: in the Russian empire these indicators were equal to 1–1.3 and 34–35 years. Hence, Japan with its starting human capital has managed to reach this level in th20th century and implement the technological breakthrough and become at par with the world developed countries. [3] Rapid economic achievements in Finland, Sweden, South Korea, is another confirmation that the human capital is the economic growth cornerstone. The human capital is acquiring particular significance in the 21st century which deserves its title as the knowledge economy.

T. Schultz is considered the author of the human capital theory who called the human capital (Human Capital) as one economic growth factor. [4]

T. Schultz approached the human study from the standpoint of capabilities and knowledge obtained through education. In his view, each educated person possesses the asset which this person can apply to the activity planning to acquire definite profit. For instance, T. Schultz writes that, if education affects production, then, from the viewpoint of economy, it is the capital form and it is called "human" because this form becomes a man's component and serves the source of satisfaction or earnings in future or both at the same time [5].

The main ideas of T. Schultz were further developed by the research of many contemporary scientists. The scientifically justified concept of

human capital resulted in the investments into personnel as the source of economic growth equal by significance with capital investments into other spheres of activity [6].

G. Becker developed the human capital theory further from the standpoint of investments into human capital. According to the theory of G. Becker, the human capital is the scope of knowledge, skills and habits a person possess the cost of which (by education, internal corporate training, etc.) Can in future lead to a considerable profit to the worker proper and to the employer [7]. The most important investments into the human capital, the scientist believes, can be education, promotion of professional experience, developed health care, personal mobility, opportunities of free access to information [8]. This approach justification implies that the human capital evolves exactly in the way like he financial capital accumulation that is it requires attracting means at the current moment to obtain extra earnings in future.

J.Ben-Porat understands the human capital is a certain "fund" the functions of which is the generation of some services in commonly recognized units of measurement. In fact, it resembles any labor tool as the material capital [9].

The human capital was explored too by home scientists.

For instance, A. Dobrynin, S. Dyatlov and S. Kurganskii understand the human capital as the investment and accumulation producing a certain combination of qualities comprising health, knowledge, abilities, motivations which can be expedient in some sphere of social production leading to promoting labor efficiency and influencing the growth of earnings y this person [10].

Ju.B. Basin and K.B. Borisova consider the human capital a 'the competence and ability of the company personnel " which is assumed as a part of intellectual capital which the researchers relate to the company capital produced by the ordering knowledge which employees possess due to he significance for the company successful functioning. The scientists attach professional experience, skills and habits, necessary knowledge, creative potential, the company image and interaction with partners, to the intellectual capital [11].

Summarizing the available approaches to the human capital definition, the human capital can be assumed the product of acquired , accumulated , merited human values expressed through physical and physiological abilities , knowledge, intellectual capabilities enabling to use them to acquire the necessary profit to satisfy human needs .

Irrespective the interpretations, most researchers are unanimous that the human capital relates to the cost investments by the public into the economic unities. Therefore, the human capital is expressed in the quality of investments into human resources in order to expect future earnings, in other words, to promote performance.

Let us consider the word experience of investing the human capital into the country's innovation progress.

For instance, at present the USA strives to achieve leadership in all trends of scientific research, to development of fruitful partnership between the state, industry and academic circles, to training scientists and engineers of the top class. One of the main priorities of the USA state policy is to encourage the scientific and technological complex. The fundamental achievements in the sphere of knowledge at the official level are a recognized economic growth base. According to the estimates available in the USA, one dollar worth research and development yield nine dollars of gross domestic product growth [12].

The USA government controls the research and innovation sphere through the agency for science and technology with the USA President. American universities play a leading role in the creation of national human capital in the sphere of science and technology. The universities are advanced national centers in those spheres of science which are considered critical for American economy. The universities develop their own policy in respect to creating scientific and technological partnership with industry.

In this case, the state provides the extra rights of particular measures to the corporation dealing with research and designing, comprising the professional retraining of personnel during transition to the innovative scientific or military engineering state order to manufacture novel products for civil or army purpose including the staff employed in foreign companies, research centers of universities.

The leaders of innovation in Europe are Austria, Finland, Denmark, Sweden, Great Britain.

Great Britain implements the program 'Train to Gain' assisting the employers to determine the required qualification level and the sphere of activity of hired staff, and the program of qualification improvement of directors and managers Leadership and Management. There is the program COMET in Austria to create the centers of competence in high technology areas, and also the program FH-plus to set up the centers of competence with the higher technological school. Germany implements the programs of qualification improvement and rendering consultations to render the training and methodological encouragement to small innovative companies.

Finland has joined leaders of postindustrial world due to creation of efficient innovation system. It has become the world first country having the concept of national innovative system which ha evolved into the main component of the state policy in the sphere of science and technology.

Finland set up in June, 2006; five main strategic centers intended to coordinate the research resources in the spheres of energy, environment protection; metal production and machine building; forestry; public health; information and communication industry. According to the state program, the investments should be channeled to thee strategic centers.

The investments into the high school science, comprising the basic share in fundamental research and some applications, are implemented through the Academy of Finland controlled by the education ministry of the central scientific and administrative body. The result of its activity has led to successful university research, implementation of basic and post diploma education. The technological universities being multibranch regional bodies of education deal mainly with application research.

The foundation of the new innovative infrastructure has resolved one of the main tasks of the finish social policy – implementation of the guaranteed high quality and publicly accessible education that has led at the same time to the acceleration of the country innovative development.

In addition to the oriented innovative system of education, the innovative Finish system includes a considerable number of organizations the technoparks and business incubators of which become the initiators of innovating progress. Each finish technopark are the universities producing the scientific personnel capable of creating the innovation product. The technoparks for universities are an extra financing source and their cooperation results is facilitation of recruitment of new staff, personnel preservation and qualification improvement [13].

Particularly appealing is the experience of developing countries such as China, India and South Korea which prevent the brain leak and attract national brains (reemigration) into national economies which bring new knowledge and experience.

The Chinese programs may serve an example of attracting students from industrially developed countries, for instance, “the Fellowship program for foreign students’ in effect since 2004. In accordance with the program, 20 thousand students receive the scholarship of two hundred dollars per month. Due to this program the number of foreign students trained in the PRC amounted to 200 thousand in 2010-2012, or 5% of all foreign students in the word (for comparison, 2% are trained in the RF).

China has also the program in effect of attracting well-known scientists and instructors under the program implementation, for instance, “Cheun Kong” during 1998-2002 paying grants of 120 thousand dollars to foreign specialist-instructors who receive the work permits of 3-4 months per year.

The PRC are particularly attractive because they stimulate the repatriation of scientific and professional personnel. For instance, in accordance with the programs in effect since 2004, such as “Big talents” and "Knowledge – innovations - initiatives” the following is envisaged:

- subsidizing and encouraging particularly the reemigrants who are capable to become leaders of scientific and technological progress;
- Departure from customary rules of employment distribution;
- Provision of special grants;
- visa status privileges [14].

Specialized innovation centers have been set up in India in the cities of Bangalore, Haidarabad and Deli suburbs by constructing new academic campuses, development of “digital” infrastructure. Facilitated visa regime is envisaged for returning specialists with provision of the special status and tax refund up to 30% of profit tax.

The result was the vigorous repatriation of a significant portion of scientific and business community and intensive growth of information technologies in the 1990s. For instance, one of the leading Indian IT companies is established by reemigrants from the USA, for mote are joint ventures with top managers occupied by reemigrants. Because of that during the passed twenty years the intellectual repatriation has permitted to establish in India a world competitive IT-industry which produces 7.5% of the gross home product and offering over two million high-tech jobs [15].

A specialized state agency was established in South Korea to intensify interaction with scientific community coordinating various repatriation programs, such as “Brains association” acting as the information and coordination center serving the repatriating scientists and specialists. Due to this effort, nowadays approximately 60-70% Korean students return after training abroad [16].

Conclusions

The high capital mobility and factors of production have led to the situation that in present time the availably natural (raw materials resources) and financial capitals (accumulated savings) are immaterial any longer. The modern economy

switched from the competition based on comparative advantages (the labor force cost and availability of natural resources) to the competition based on the advantages comprising the advantages of unique production and processes, in other words, the intellectual capital.

The production of capital consuming products in the 21st century is not by all means implemented by rich countries and labor consuming products by the countries with considerable labor force. The availability of natural resources has little effect either on the competitiveness because the production of science consuming goods is insignificant. Only the factors of economic growth such as human capital and the knack of its application (the innovation system) matter.

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7/13/2014