

ATTEMPTS TO EXPLAIN THE "ASIA'S MIRACLE" BY FACTOR THEORY. ROLE OF EDUCATIONAL EXPENSES

ABSTRACT

Objective: to reveal the limits of human capital growth in developing and transitive economies.

Method: comparative analysis.

Results: hypothesis is formulated that educational expenses under the average per capita GDP lower than \$ 10 thousand cannot significantly influence the growth of educational index of the population and the growth of human capital.

Scientific novelty: the influence of GDP growth on investment level in science and education in developing countries is revealed; it is shown that reducing costs on education increases the Russia' lagging behind the West, and that with the per capita GDP existing in Russia and Third World countries the effect of education financing of less than 7% of GDP will be negligible.

Practical value: possibility to use the research results when investing capital into science and education in Russia.

KEYWORDS: human capital; educational expenses; education economy; economic growth.

Introduction and results of research

Since 1990s, processes of liberalization of national markets have created conditions for deepened internationalization of world economy. These processes were accompanied at some places by rather high rate of production and consolidation of business structures. Governments of many developing countries, considering science and technics a prerequisite for economic growth and development, intended to create in their countries such economic systems in which knowledge would serve as the main factor of economic growth in future. They took certain measures in order to open their markets for foreign trade, for investment, started to develop infrastructures of science and technology sectors, expand the system of higher education, facilitate industrial research and advanced technical development of local innovation structures. Some countries of Asia achieved significant success in those efforts.

«Miracles of development» are one of the most fascinating phenomena in the framework of contemporary theories studying economic growth. However, success of some countries are still astonishing. For



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example, for the period of 1960–1990, average annual rate of production growth in Japan and South Korea made over 5% annually [1].

Objective of the present article is detecting limits of growth of human capital in developing and transitive economies demonstrated by case study. We consider that Paul Krugman has somewhat exaggerated the positive role of scientific and technical progress in the development of third world countries. We tend more to the conceptual idea of J. Stiglitz that economic growth in the third world and beyond has been triggered by widened export opportunities, which created the effect of «living at the expense of the neighbor». The study of daily life of developing societies conducted by W. Easterly in late 20th century found that for many third world countries, investment in education has zero or negative effect.

The ideas of W. Easterly, J. Stiglitz and other proponents of concepts of non-technological nature of economic systems transformation in the post-war world are very suitable for the analysis of the situation in Russia, since in our country, investment in science and education made during the whole Soviet period had not brought about the expected socially significant effect. In the situation with DPRK, we see that transfer of advanced technologies leads to negative consequences not only for an individual country, but also for the whole world.

Four main factors, in the opinion of P. Krugman, explain the amazing economic growth of South Korea [2]. First – the defining role of the government in the course of the reforms. Second – strategy of export focus of the national economy justified by the shortage of natural resources. Third – abundance of cheap

and at the same time well trained and disciplined workforce. Fourth – international climate favorable for trade. Due to the influence of these factors and changes started from 1962, South Korea has turned out of one of the poorest agricultural countries into a rapidly developing industrial economy. This leap got the name of the «economic miracle on the river Han» (the Han river flows in Seoul).

The reforms started and continued under auspices of South Korean government by means of state planning. The tasks and the course of the reforms were formulated in the first five-year plan of economic development for 1962–1966. It clearly stated the strategy of export-focused industrialization. Structural reorganization stipulated a decisive turn from agricultural economy to modern economy of processing industry and export trade. The five-year plan was focused on creating the basis of industrialization. Other plans were adopted as well, like, for example, the large-scale five-year program of tariffs reduction worked out in 1984. As a result, rate of tariff for the produced goods was reduced on average from 22,6% in 1983 to 6,2% in 1996.

Mechanization of agricultural production on the basis of industrialization, consolidation of farming enterprises significantly reduced the percentage of rural population in the country, facilitated their floating to cities. The percentage of rural dwellers in South Korea was reduced from 57% in 1962 to 11% in 1995. At the same time, manufacture of agricultural production increased. It doubled for 15 years, starting from 1962. In 1995, 4,7 mln tons of rice was produced.

When characterizing changes in the production industry and the whole economy, South Korean statistics employs the notion of «primary», «secondary», and «tertiary» sectors of economy. The primary include industries producing goods out of natural raw materials: agriculture, fishery, extraction industry. The secondary industries are all those making ready-made products (light and heavy industry, machinery manufacturing, electronics, etc.). The tertiary include all non-production sectors functioning on the basis of material production, including banking, science, education, management, culture, state service, trade, service industries, etc.

The general dynamics of the change of ratio of those industries in South Korean economy in the course of increasing processes of industrialization and modernization consisted in significant reduction of the share of the primary industries, growing role and effectiveness of processing secondary industries, and on that basis increasing number and percentage of the employed in state service, in trade, etc. Thus, the share of agriculture, fishery, and extraction industry in the

overall economic structure decreased from 34,8% in 1966 to 23,5% in 1976 and 6,6% in 1995. The percentage of the employed in those industries among all the employed decreased from 50,4% in 1970 to 34% in 1980, from 17,9% in 1990 to 12,5% in 1995.

At the first stages of industrialization, the traditional for South Korea branches of light industry were modernized, especially textiles. The highest rate of development was demonstrated in heavy and chemical industry, machinery and equipment manufacturing, electronics, shipbuilding, automobile construction for home and foreign market. After 1990, South Korea rated 6th in the world in production of steel. The share of intensively developing processing industries in the economic pattern of the country increased from 20,5% in 1966 to 27,2% in 1995. The percentage of the employed in them among all the employed grew from 14,3% in 1970 to 22,5% in 1980 and 23,5% in 1995. The share of tertiary industries in the economic pattern of the country increased from 44,7% in 1966 to 66,2% in 1995. And the proportion of the employed in them among the working population grew from 35,3% in 1970 to 43,5% in 1980, from 54,5% in 1990 to 64,0% in 1995.

The increase in gross national income (GNI) of South Korea by five-year periods, in bln. US dollars, is shown in Fig. 1.

In foreign trade, the volume of South Korean export increased multifold – from 30 283 mln doll. in 1985 to 125 058 mln doll. in 1995. The first place is taken by export of machinery and transportation equipment – 11 384 mln doll. in 1985 and 65 646 mln doll. in 1995; second place, by manufactured goods, respectively 15 436 mln doll. and 40 750 mln doll.; third – chemical and similar products, respectively 936 mln doll. and 8 944 mln doll. Yet, import still exceeded export due to the shortage of natural resources. Thus, import of crude fuel, oil lubricants and associated materials made 7 363 mln doll. in 1985 and 19 103 mln doll. in 1995. And import of raw technical materials, except fuel – 3 875 mln doll. in 1985 and 11 713 mln doll. in 1995. Manufactured goods, machinery and transportation equipment, and other goods are also imported.

Foreign trade of South Korea is mostly focused at countries of Asia. In 1995, export in those countries made 61 565 mln doll., and import from them – 54 921 mln doll. Conversely, export in the Americas in 1995 reached 33 292 mln doll., and import from that region – 36 972 mln doll. With countries of Europe, import also exceeded export respectively 22 452 mln and 20 854 mln doll.

The generalized conclusion from the data of following the economic experience of 40 developing

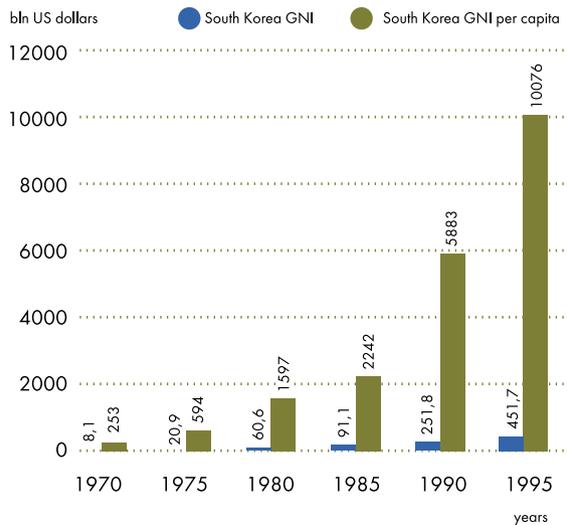


Fig. 1.
Ratio of gross national income of South Korea and gross national income of South Korea per capita

countries of Asia, Africa and Latin America is that economic development, besides the intensive employment of conventional factors of production, is accompanied by significant «transformations of order», i.e. transformations of institutional structures [1]. It is also recognized that a clear sign of economic development is fundamental change in sectoral structure of production known as «structural transformation» meaning increasing share of industrial production and corresponding decrease of the share of agriculture in full employment and GNI [3, 4].

In addition, of special interest is the dynamics of indicators characterizing development of intensive sectors. In the course of the decade (1996–2007), the rate of research and development (RD) in developed countries was lower than in developing countries. In USA, EU and Japan growth of expenses for RD fluctuated in the range of 5,4 to 5,8%, while in Singapore and Taiwan this indicator was around 9,5–10,5 and 12% in South Korea [5].

The influence of the global economic recession on innovation expenses, characterized by dramatic and sharp decline of this indicator in most countries in 2008–2009, appeared paradoxical in China where growth of expenses for RD made 28% – the highest indicator since 2000.

Relatively high rates of RD of Asian economic systems (except Japan) led to changes in the global distribution of the expected expenses for innovation. Compared to 1996, the region of North America (United States, Canada and Mexico) cut its share in

the world expenses for RD from 40 to 36% by 2009; the share of EU decreased from 31 to 24%. The share of Asia / the Pacific region increased from 24 to 35%, despite slow growth rate of Japan.

The preliminary conclusion is that do not have to possess «traditional» resources any more in order to have opportunities to incorporate into global economy. Opportunities become less «predictable» in terms of classical production functions and concepts of production structures. In this situation, economic success is more dependent on the flexible thinking of corporate managers and politicians: they have to find a suitable place and time where and when it is possible to incorporate into the dynamic system of production and selling chains.

The success secret of «Asian Tigers» is just the thing that they have managed to realize a rapid and effective switch from one development strategy to another. In response to the shift in the world demand, they were able to expand production of exported goods, basing it on knowledge and not on conventional resources.

However, it should be noted that the current state of world economy does not allow to copy the policy methods of Asian countries in most developing states due to liberalization of foreign trade under the conditions of globalization, limitations of International Monetary Fund in respect of currency policy, as well as rigid requirements of GATT – WTO. But this does not mean that Asian experience is of no use for others. The success example of Asian economies reveals the value of internal sources of growth in the purposeful, complicated and pragmatic state policy of economic development. In our opinion, in modern economic strategy of Russia, the experience of investment development of Asian countries will prove rather helpful.

On the background of all these data, the reasons behind the economic recession in USSR / Russia in late 20th – early 21st centuries are not clear enough. Despite their economic growth, the republics of the former USSR demonstrate a degenerative system of innovation economy and have practically no structures of knowledge economy, even as different from Singapore and Malaysia. We doubt, too, that high expenses for research and technological development in a number of countries of Asia are the source of economic growth there. Our doubts are based on statistical observation of the development of a number of economies, including Russian.

As shown in innovation economy study conducted by D.D.Timchishin in 2010, the correlational dependence between growth of investment in research efforts and increase in gross domestic product (GDP) in some countries is merely insignificant (Fig. 2).

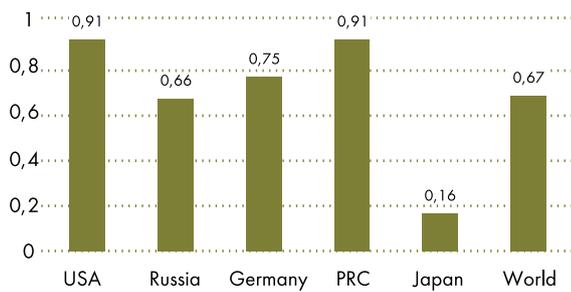


Fig. 2.
Correlational dependence between growth of GDP and expenses for research in GDP for five countries [6]

Low dependence between research and growth of GDP in Japan is an illustrative case indicating that investment in science and education is not of positive effect everywhere and at all times. A few years earlier, M. Gurgand detected small correlation dependence between time spent on education and growth of GDP in developed countries (coefficient was 0,03) [7].

Last decade, an opinion was stated that education can produce effect only if knowledge is provided under the conditions of the corresponding institutional environment [8]. Around the same time, Russian researchers G.G. Popov and T.V. Leus attempted to show dependence of economic growth and its quality on economic structure and level of development of civil society on the basis of mere empirical comparison [9]. Observations of these researchers found in most cases a strong influence of the raw-material orientation of the national economy on the level of development of democracy and institutes of civil society. It is interesting to compare the level of volume of investment in science and education in those states with the countries having no problems with democracy. Also of interest here is to have a look at the growth rate of GDP per capita.

Among the countries surviving through the acute «raw materials curse», according to G.G. Popov and T.V. Leus [9], are Saudi Arabia, Brunei, Iran, Libya, Algeria, Malaysia, Egypt. At the time of their article, revolutions in Libya and Egypt had not yet taken place. These «disadvantaged» countries, in the opinion of Popov and Leus, were contrasted by Thailand, Lebanon and Turkey as states with relatively successful development of institutes of civil society. We will compare investment in science and education for countries with different level of development of institutes of civil society.

Since statistical analysis of third world countries is difficult and rather disputable, we will take indicators of early 2000s, as general tendencies can hardly change even within one generation (see Table 1).

From the data in the table below, it is not obvious that the level of education of the population depends on the level of development of institutes of civil society and on specialization of economy. We can say that we detect a weak connection between the level of education, percentage of people having higher education, and GDP per capita in different countries. Most probably, marginal return on investment in education in third world countries and in non-European societies on the whole has boundaries of 30–40% coverage of population aged younger than 19.

The problem of low return on investment in education for non-European societies is evidently, for the most part in the level of their GDP on the whole. Malaysia spends 5,1% of its GDP on education, while Sweden – 6,7% (data as of early 2000s¹), yet the latter has GDP per capita almost three times as much, that is why the effectiveness of educational expenses is higher.

As it is seen from the data in table 1, education index of population fluctuates insignificantly depending on the educational coverage of children and teenagers. This means that the sensitivity threshold for economy of a developing country to education funding reaches 40% of educational coverage of school-agers. Roughly speaking, when four out of ten children and teenagers study at school, if we add another one to them, we do not get the expected effect of GDP growth. Apparently, this conclusion is valid only in case if the state spends 4–6% of GDP for education.

In Russia, educational expenses in 2007 made 3,6% of GDP, in 1999 – 4,1%, when GDP per capita made about 10 th. US doll. in 2005. For 2013, educational expenses of the consolidated budget of Russian Federation are allotted in the amount of 4,5% with further lowering to 3,9% in 2014 [11]. This means that economic growth was not and is not able to facilitate development of human capital in Russia. Private capital and citizens of Russian Federation spend money for education in small proportions, and it is inexpensive on average around the country if we take into account tuition for extramural and evening higher education.

Conclusions

In this way, the policy of educational expenses containment conducted since early 1990s only stretched and continues to stretch the lag of Russia behind the West, decreasing together with that marginal return on investment in education. If we imagine that more than half of children and teenagers

¹ Russian education in the context of international indicators: comparative report. – M.: Ministry of Education of Russian Federation, 2002

Table 1.

Basic indicators of development of education in selected countries (as of year 2000)*

Indicator	Sweden	Turkey	Hungary	Egypt	Malaysia	Thailand	Indonesia
Educational coverage of population, % (aged 15–19)	86,4	28,4	81,1	31,4	46,5	60,2	38,5
Educational coverage of population, % (aged 20–29)	33,4	5,2	18,7	less than 5%	6	less than 5%	3
Education index	98	81	96	No data	No data	86	83
Percentage of people with higher education aged 24–55, %	21	10	17	No data	10	No data	2,1
GDP per capita, US dollars (as of year 2005)	31420	8420	16940	5904	9120	8380	3230

* Source: compiled based on [10].

in Russia did not study, the effect would be the same as if they studied. This rule, valid for all non-European or non-Western societies (remember the famous rule of the Soviet school that a quarter or even a third of students most of the time merely «wear out the seat of their trousers»). The way out of this situation is in increasing educational expenses at least to the level of 7% of GDP.

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