

### The Structure of Foreign Investment: Russian Knowledge-based Economy

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Abstract: Foreign capital promotes to globalize knowledge-based economy in many countries and in Russia. Shown the structure and trends of foreign capital which is appeared in Russia recently in order to develop science and high tech industries which use materialized knowledge on up-to-date stage. Revealed that foreign investors until now channel insufficient investment in high risky innovation sphere of Russia. Examined the composition of investment both for "input" in knowledge-based economy which is presented by the sector of higher education, research and development, software development where new knowledge is worked out and distributed, and for "output" which involves the sector of high tech and medium tech industries using innovation in real sector of economy and society providing economic growth.

**Key words:** knowledge-based economy; high tech industries; foreign investment **JEL codes:** O14, O3

### 1. Introduction

Globalization of economy is becoming the organic characteristic of social and economic processes in various countries all over the world because of international division of labor both in material production and non-material services sector. Economic growth of any country is more and more dependent on the efficiency of involving knowledge, human capital and financial capital into innovation processes and on the results of cross flow between developed and developing countries.

There are many forms of globalization in innovation sphere. The results of transnational corporation, large companies and pecuniary institutions activity are most apparent. They ensure the income of direct investment by way of establishing joint productions and investing high tech projects. As a result, technological transfer occurs based on the use of knowledge obtained in countries of production of new technics and technologies into the countries of consumption by means of licensing agreements and production and services import. The coming of foreign companies in Russia assists to train highly educated personnel, conduct research and development, develop cooperation networks including based on modern information and communication technologies.

Among them Novartis, Air Liquide, Intel, Schlumberger and others. Intel for example opened the centers on software development in Moscow, St. Petersburg, Novosibirsk and Nizhni Novgorod and uses these centers as its global R&D network.

Transformation of structure technological sectors depends on a set of major factors:

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(1) scale of investment between the sectors of economic activity including new industries and renovation of traditional industries;

(2) research intensity and velocity of innovation re-equipment of high and medium technological sectors and service sector;

(3) technological level of the already established industrial basis of economy, extent of its exhaustion and possibilities of drastic industrial re-equipment;

(4) regional allocation of industries which determine the specialization of industries and immensity of infrastructure objects maintaining the area;

(5) high educational level of the population and the quality of its health, to create and use new technology to produce innovative products and services;

(6) institutional limits and risks restricting technological transformations of the RF's economy.

Later in the article will be examined mainly the first two factors as innovation and investment which accompany each other and as a result affect on the competitiveness countries. In turn, developed countries have the opportunity to direct more investment on human development and science.

It is widely known that the composite indexes of countries are interconnected (Table 1). As a rule, those of countries that have high and index knowledge economy (KEI) at the same time demonstrate the high indexes: Global Competitiveness Index (GCI) and Human Development Index (HDI). For example, it takes place in Norway, although it is resource gathering country as Russia. A high GCI of China currently depends on the size of markets, but in China the government will focus on innovative development and higher index of the knowledge economy.

It is noticeable that at the present time, Russia has the highest knowledge economy index among the SNG's countries and BRIC's countries. However it is necessary undertake significant efforts to achieve the same performance of developed countries (Table 1).

Countries, 2012	Global Competitiveness Index (GCI) <sup>1</sup>	Knowledge Economy Index (KEI) <sup>2</sup>	Human Development Index (HDI) <sup>3</sup>
Switzerland	1	10	9
Sweden	4	1	7
United States	7	12	3
Germany	6	8	5
Japan	10	22	10
Norway	15	5	1
Australia	20	9	2
China	29	84	101
Brazil	48	60	85
India	59	110	136
Russia	67	55	55
Ukraine	73	56	78
Belarus	N/A	59	50
Kazakhstan	51	73	69

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<sup>1</sup> Schwab K. (2012). The Global Competitiveness Report 2012-2013, Published by World Economic Forum, Geneva.

<sup>&</sup>lt;sup>2</sup> Knowledge Economy Index (KEI) Rankings 2012 (2012), available online at: http://siteresources.worldbank.org/INTUNIKAM/Resources/2012.pdf, accessed on 28.03.2013.

<sup>&</sup>quot;The rise of the south: Human progress in the diverse world", Human Development Report 2013, (2013). UNDP, NY, USA.

#### 2. Development of Assumptions

The development of a favorable investment climate depends on the structure of investment in the knowledge economy. In Russia an innovation infrastructure based on technology cities, technological parks, technical implementation zones and innovation town Skolkovo is in progress. The creation of hospitable investment climate in these areas may attract foreign residents including high tech companies with well-known global brands. Interacting with these investors partly helps Russian knowledge-based economy to start up.

Direct home and foreign investment in education, science and software development moves a base to create knowledge store and its further replication in the forms of new educational skills, innovation industrial culture and to the development of new kinds of machinery and technologies resulted from fundamental and applied research.

#### 3. Methodology

Consider next the scale and structure of foreign investment in the frame of approach which is characterizing a knowledge-based economy as a system of production, consumption and redistribution of knowledge enabling countries to step into drastic reformations in science, education and business in order to entry into the world high tech markets.

There are different statistical classifications that distinguish the composition of participants, production, expenses of separate components of knowledge-based economy (Organization for Economic Co-Operation and Development (OECD), 2001). According to the methodology of World Bank a system of knowledge-based economy consists of four groups of social economic factors: institutional regime, educational level of population, the state of information and communication infrastructure and the development of national innovation system including its high tech sector (Innovation vector of knowledge-based economy/Science editor G. A. Untura, 2011).

Classification methodology of the sectors of economy based on its technological level has been adopted and in use by OECD.

In Russia, V. Makarov, academician of the Russian Academy of Sciences (RAS), proposed rendering of knowledge-based economy which registers both World Bank approach to estimate knowledge intensive economy and European experience to characterize components of knowledge-based economy and classify its sectors in terms of "input-output" (Makarov, 2003), which includes OKVED system (Russian Classification of Economic Activities). Block "Input" enters expenses for generation and replication of new knowledge in the organizations of higher education, science and information and communication infrastructure.

#### 3.1 The Structure of the Analyzed Elements of the Knowledge Economy

Block "Output" contains investment in high tech and medium tech industries which consume new knowledge and also a sphere of high tech services: telecommunications, financial sector, insurance business, machine and equipment lease services, computer services, marketing studies and consulting. According to the expanded rendering of World Bank, the structure of knowledge-based economy includes in addition to education also health service as large-scale high tech and science-intensive services. Trends and distribution of foreign investment between the main components of blocks "Input" and "Output" are presented in Tables 2-5 and the share of each block in total volume of foreign investment in the Russian Federation is presented in Table 5. Foreign investment trends for generating and consuming knowledge as an innovation have their own specific nature.

#### 3.2 Measures and Data Collection

Used the method of statistical grouping by blocks of components of the knowledge economy and the data of the official federal statistics on Russia (Rosstat, Federal State Statistics Service. Central Base of statistical data). Came through other investment in Russia from abroad (thousand dollars) taking into account readjustment of rouble equivalent (http://www.gks.ru/dbscripts/Cbsd/DBInet.cgi?pl=2108623), in the context of classification OKVED codes (see Table 1).

#### 4. Key Results

For the industries of block "Input" which produce knowledge, in 2011 most investment fell on R&D sector and amounted to 93% of total volume of producing knowledge investment. From 2009 foreign investment expenditures to develop higher education has started though they amounted to only 0.3-0.4%. The share of foreign investment to develop software in 2009 amounted to almost 70% of all foreign investment of this block and in 2011 this figure was only about 6% (Table 2).

Table 2	Trends of Foreign Investment in Russian Knowledge-Based Economy ("Input")
	[Done on Federal State Statistics Service]

Industries	2005	i	200	)9	20	010	2011 (Januar	y-December)
(OKVED codes)	thous. doll.	%	thous. doll	. %	thous. do	oll. %	thous. doll.	%
Software development (72.20–72.60)	9583	36.5	119070	69.6	9612	18.9	13960	5.8
R&D (73.10-73.20)	16681	63.5	51714	30.3	41120	80.8	223737	93.8
Higher education (80.30.1-80.30.4)	20	0.0	196	0.1	167	0.3	936	0.4
Subtotal	26284	100.0	170990	100	50899	100.0	238633	100.0

Within the 2005–2011 period the volume of foreign investment in producing knowledge increased almost tenfold in value terms and its share in total volume of foreign investment grew approximately by 2.5 times and amounted in the end of this period to 0.13%.

The main share of total volume of all foreign investment occupies the industries of "Output" block providing demand for fundamental knowledge and consumption of high tech innovations. However the share of high tech industries of most recent patterns is less than one percent of all investment of "Output" block (Tables 3-4). In the sphere of high tech services up to 91.9% of all investment of consuming innovations block have been involved in 2011 (see Tables 3-4).

Thus the volume of foreign investment in high tech sector and high tech services sector increased about twelve fold by 2011 and its share in the total volume of foreign investment in the Russian Federation grew by 3.3 times and amounted to 54.5% (Table 5). Where in education and health service only doses of percent are put up, though the most investment is channeled to financial and communication sectors (financial market management, financial intermediation, capital expenditures in funds and property etc.) that is this investment is not real investment to develop high tech production and basic services of knowledge-based economy.

Overall share of investment of "Input" and "Output" industries of Russian knowledge-based economy in the total volume of foreign investment expenditures (Figure 1). In consideration of above listed reasons we notice that the share of foreign investment to develop basic sectors of Russian knowledge-based economy (science, education and most recent high tech businesses) in the total volume of coming foreign investment has not increased (see Figure 1) and even decreased to 5% in the total volume of foreign investment while in recessionary 2008-2009 period it was about 7%.

	[Done	on rederal state	Statistics Service ]		
	2005	2008	2009	2010	2011
Foreign investment in knowledge-based economy of the Russian Federation, total ("Input" and "Output")	53651046.6	103768916.8	81927265.47	114746003.3	190643353
High tech industries of the 1st level	163704.7	988592.72	838587.53	759238.38	826672.37
High technologies of medium level	2951038	6198941.14	5355869.7	6062029.43	8356394.51
Sphere of high tech services	5642931	13632698.28	10002140.61	44133099.97	94507667.6
Education	127.4	0.79	458.3	872.56	1612.87
Health service and provision of social services	15356.2	19775.69	25633.89	12693.02	41904.06
Subtotal "Output"	8773157.3	20840008.62	16222690.03	50967933.36	103734251

## Table 3 Foreign Investment in Knowledge-based Economy of the Russian Federation ("Output") [Done on Federal State Statistics Service ]

Table 4 Structure of Foreign Investment in Knowledge-based Economy of the Russian Federation ("Out
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Industries	2005	2008	2010	2011 (January-December)
Total	100.0	100.0	100.0	100.0
High tech industries	2.1	3.0	1.5	0.8
High-medium tech industries	33.2	28.8	11.8	8.1
Sphere of high tech services	64.5	68.1	86.7	91.1
Education, health service	0.2	0.1	0.0	0.0

Rated on: http://www.gks.ru/dbscripts/Cbsd/DBInet.cgi?pl=2108615.

# Table 5Share of Foreign Investment in Knowledge-Based Economy of the Russian Federation in the Total Volume of<br/>Foreign Investment in the Russian Federation, %

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Industries	2005	2008	2010	2011	
"Input"	0.05	0.09	0.04	0.13	
"Output"	16.43	20.95	44.66	54.41	
Subtotal	16.48	21.04	44.70	54.54	

Rated on: http://www.gks.ru/dbscripts/Cbsd/DBInet.cgi?pl=2108615.

This fact approves the foreign investors' interest together with Russian investors in debt financing foremost profitable processing (food industry) or extractive industries which production has a stable demand on world markets. The future of academic studies, education and health service, high tech industries and software development which make the foundation of knowledge-based economy of Russia as before will depend on the scales of attraction of inland "long" money into above listed spheres.

As suggested by academician A. Aganbegyan (Aganbegyan, 2012) it is necessary to increase the proportion of the knowledge economy (science, education, information technology, biotechnology and health care) in GDP from 15 to 35% including: science—from 1 to 3%, education—from 4 to 8%, health and biotechnology—from 5 to 10%, information technology—from 5 to 15% in the coming years.



Figure 1 Effect of High Tech Services on the Volume of Attracting Foreign Investment in Russian Knowledge-Based Economy

#### 5. Discussion and Conclusion

In 2011 around \$52 billion of direct investment (DFI—direct foreign investment) have been brought in Russia however clear outflow of capital from Russia exceeded \$84 billion. "At this almost half of DFI amounted to transport, communication and extractive industries (47%), while science and education could attract only 1.8%, that is four times less than real estate transactions -7.8%" (Vardul, 2012, p. 36).

In the eyes of N. Vardul, the chief editor of "Financial newspaper", this foreign investment most likely has "Russian roots" and comes back from offshores into Russian economy sectors which can bring back a quick payoff.

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