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**ICT Modernization and Globalization:
Russian Perspectives**

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Summary: The development of ICT is considered as an important indicator of globalization. The main hypothesis is that the development of ICT and global activities of both countries and regions are positively correlated. As criteria for global activities the exports and FDI-inflows are taken. The hypothesis is tested with the example of the world economy, post-socialist countries and Russia. Russian regional differences in ICT development in the context of the global activities of Russian regions are analyzed.

Zusammenfassung: Im Beitrag wird die Entwicklung der I.u.K.-Technologien als ein wichtiger Globalisierungsindikator betrachtet. Die Haupthypothese besteht darin, dass es eine positive Korrelation zwischen der Entwicklung der I.u.K.-Technologien und den globalen Aktivitäten der Länder bzw. der Regionen gibt. Als Kriterium der globalen Aktivitäten werden Exporte und Zuflüsse der ausländischen Direktinvestitionen betrachtet. Die Zusammenhänge werden anhand von Beispielen der Weltwirtschaft, der postsozialistischen Staaten und speziell Russlands geprüft. Es werden die regionalen Unterschiede in der Entwicklung der I.u.K.-Technologien Russlands im Kontext der globalen Aktivitäten russischer Regionen analysiert.

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Discussion Paper 199

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1. Introduction

At the beginning of the 1990's, the term "new economy" appeared in the literature. This term characterized the rapid expansion of the information and communication sector as a global phenomenon (Welfens/Jungmittag, 2001). An increase in the share of information and communication technologies (ICT) in the GDP of industrial countries, a drop in computers and communication services prices, new products and services in the information sector – all these trends spoke for a new stage in development of the world economy.

The term "new economy" is closely connected with economic globalization. Developing information and communication technologies make the connections between the economic agents easier. This is one of the prerequisites for considering the world economy to be a whole (global) system.

The interdependence of ICT development and globalization is sophisticated¹. Duwendag distinguishes between quantitative indicators (dynamics of the volumes of world exports, international direct investments, transnational capital movements) and qualitative steps of economic globalization (establishment of regional trade and economic unions, opening up of developing countries, expansion of multinational companies, transformation processes in post-socialistic countries, development of ICT). So, according to Duwendag, the ICT development is one of the qualitative steps of globalization (Duwendag, 2006).

The analysis in this article is based generally on this concept. We consider only two quantitative indicators of globalization: volumes of exports and international direct investments. Our hypothesis is that ICT contribute to the development of communications between economic agents and have positive influence on the dynamics of these two indicators.

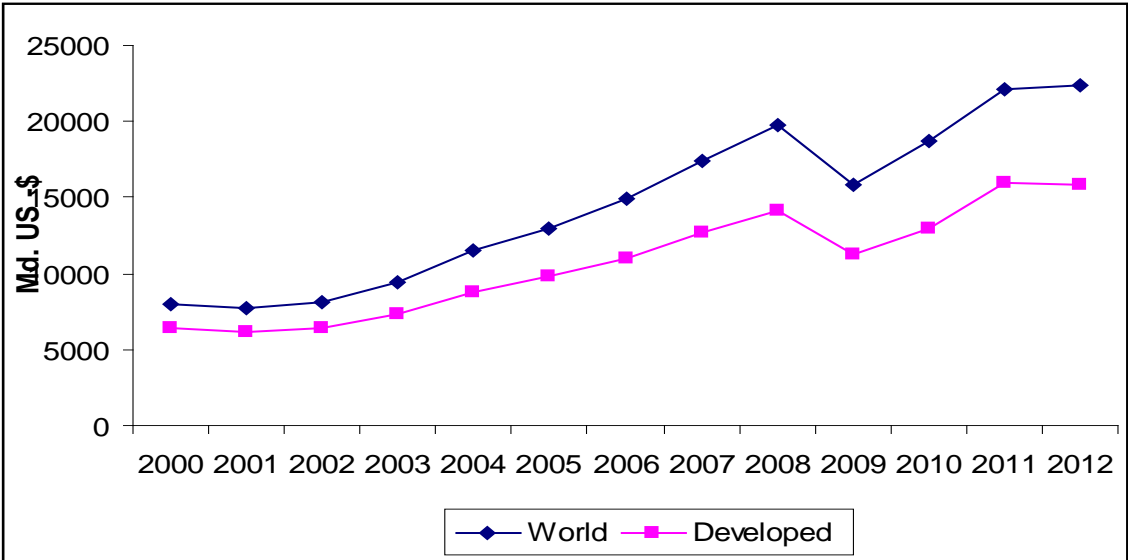
The main research field is the economy of Russia which is characterized by some special features. First of all, it is a *post-socialist country* where the transformation processes have been taking place during the last 20 years and more. So, we consider ICT to be one of the main factors defining the positions of post-socialist countries in the globalizing world (based on international trade and FDI). The situation in Russia is compared with some other post-socialist countries. As a gigantic country Russia is characterized through significant *regional differences*. We make analysis of these differences in our article.

¹ For example Welfens and Vogelsang point out that "the expansion of ICT is associated with the growth of a network society in which the flow of information and technology on the one hand is accelerating. At the same time, both ICT and digital networking facilitate international outsourcing and offshoring. Offshoring involves foreign direct investments while international outsourcing occurs through trade and arm's length market transactions" (Welfens/Vogelsang, 2008).

2. ICT development as an indicator of globalization

In our article, ICT development is considered to be one of the most important factors of *globalization*. Globalization is a very popular term being used frequently during the last two decades. Ohmae (2006) defines globalization as the “integration of national economies into the international economy through trade, foreign direct investment, capital flows, migration, and the spread of technology. It is the diminution or elimination of state-enforced restrictions on exchanges across borders and the increasingly integrated and complex global system of production and exchange that has emerged as a result”. So, the significance of international trade and international direct investments² is accepted by many experts. The development of the world economy since the 1970s has been characterized through the rapid dynamics of both international trade and FDI. This dynamic for 2000-2010 is shown on Fig. 1 and Fig. 2.

Figure 1: Dynamics of world exports in 2000-2012 (Md. US-\$)



Source: www.worldbank.org

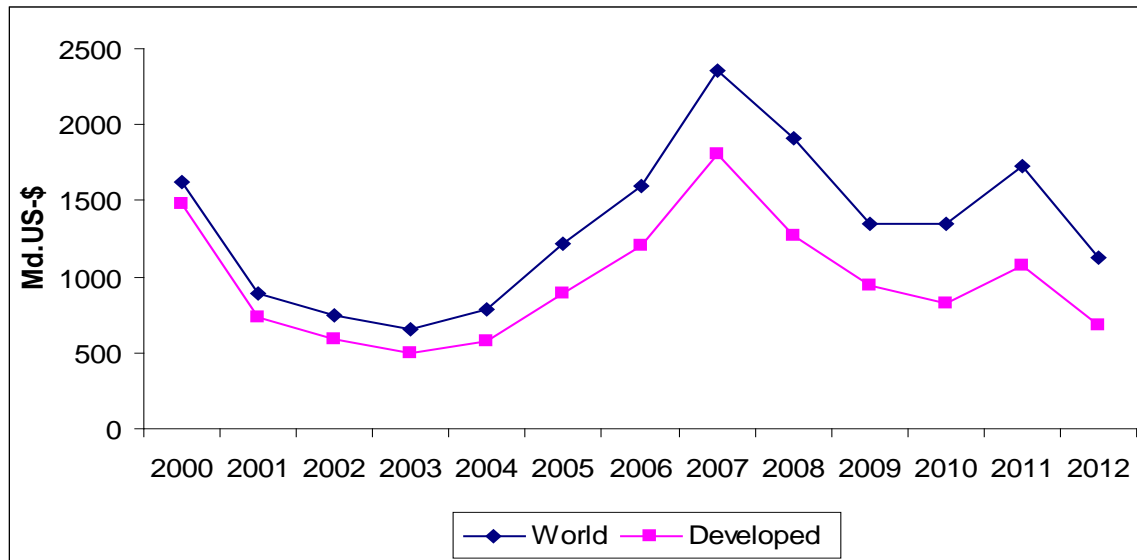
Based on the data of Fig. 1 and Fig. 2 some interesting trends can be identified. First of all, the rapid increasing of both the international trade and FDI volumes is obvious. On the other hand, the domination of developed countries in these international transactions is incontestable. 90% of international trade and 85% of FDI received fall on developed countries.

The increasing of both international trade and foreign investment activities is typical for the developing countries as well. However the share of developing countries in these

² According to the IMF (1993) “...Direct investment is the category of international investment that reflects the objective of obtaining a lasting interest by a resident of another economy. The lasting interest implies the existence of a long-term relationship between the direct investor and significant degree of influence by the investor on the management of the enterprise. Direct investment comprises not only the initial transaction establishing the relationship between the investor and the enterprise but also all subsequent transactions among them and among affiliate enterprises, both incorporated and unincorporated”.

processes is not yet significant. So, the developed countries remain the main driving forces of globalization.

Figure 2: Dynamics of FDI in 2000-2012 (Md. US-\$)



Source: www.worldbank.org

Some differences in the development trends of international trade and FDI can be observed. Until the crisis of 2008-2009, stable development was typical for international trade (Fig. 1). Only in 2009 did volumes of international trade decline both in the world as a whole and in developed countries.

Dynamics of FDI seem to be undulating. After the high level of FDI in 2000, there was a declining of FDI volumes in 2001-2003. Then FDI volumes increased again. Such trends could be explained through specifics of investor reactions to particular events. The recession of the world economy after the act of terrorism on 11th September 2001, wars in Afghanistan and in Iraq – all these tragic events could have lead to the reducing of international investment activities as a whole and FDI-activities in particular. However after 2003 these activities increased again and continued until the crisis of 2008.

The rapid development of ICT has become especially apparent since the beginning of the 2000's. At present, the production and consumption of information as the most valuable strategic resource becomes a basis for all economic activities. The value is added mainly by intellectual activities, increasing technological level of production as well as diffusion of modern ICT.

In many countries, both governmental and non-governmental organizations contribute to forming the prerequisites of an information society in the belief that *“the first countries to enter the information society will reap the greatest rewards”*³. These rewards were

³ Europe and the global information society: Bangemann report recommendations to the European Council, 1994. - <http://www.epractice.eu>

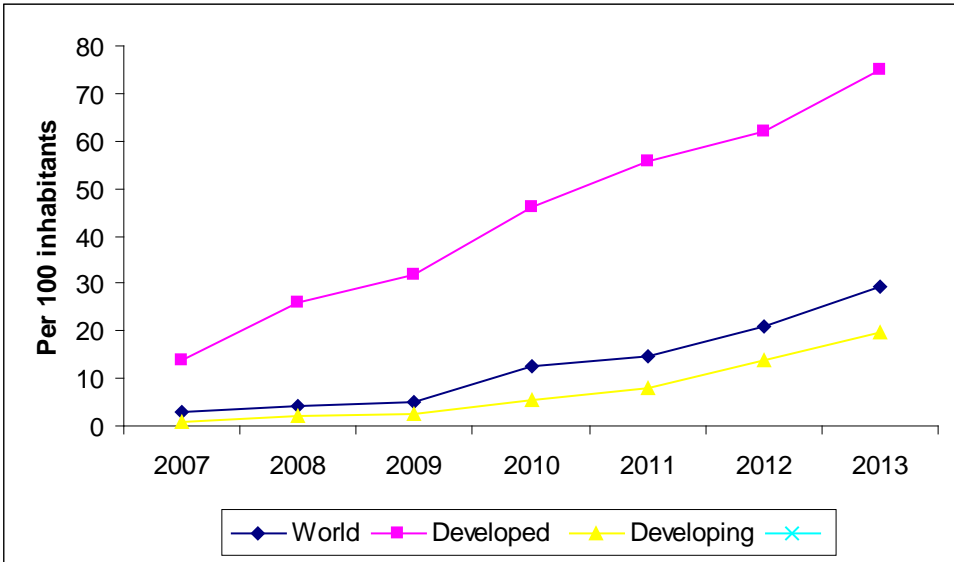
expected to be a higher quality of life, more creative freedom, more efficient, transparent and responsive public services, greater competitiveness of business and a minimizing of distance and remoteness. The governmental and non-governmental activities to foster this information society are mostly focused on advancement in ICT, legislation development, e-government creation as well as researching the social and cultural aspects of the information society.

In 2000, the G8 leaders adopted the Okinawa Charter on Global Information Society⁴, which stressed the vital importance of IT for the sustainable growth of the world economy by enabling people to fulfill their potential. According to the Charter, the essence of the IT-driven economic and social transformation is its power to help individuals and societies to use knowledge and ideas.

In 2003 and 2005, the World Summit on the Information Society was held in Geneva and Tunis. The outcome documents⁵ of the Summit showed the capacity of ICT to reduce many traditional obstacles to development, especially those of time and distance. However the benefits of IT revolution are today unevenly distributed *between* the developed and developing countries and *within* the societies. This situation has been named “*digital divide*”.

The ambitious goal stated in the above-mentioned documents was to bridge the digital divide and to ensure building an inclusive information society. However, since then the digital divide has hardly been bridged. The empirical evidence of the ICT development after 2000 is shown on Figures 3-7.

Figure 3: Mobile -broadband subscriptions, penetration

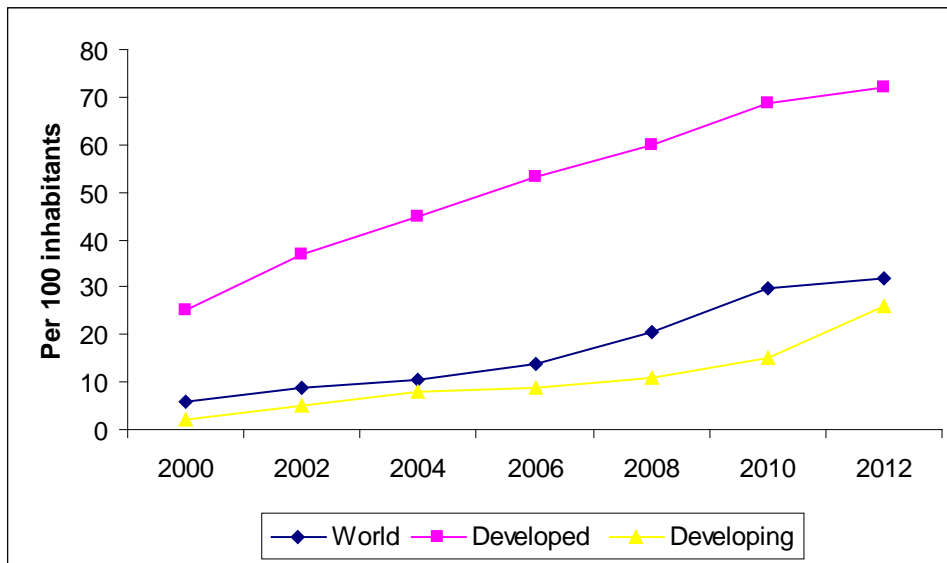


Source: www.itu.com

⁴ Okinawa Charter on Global Information Society, 2000. - <http://www.g8.utoronto.ca/summit/2000okinawa/gis.htm>

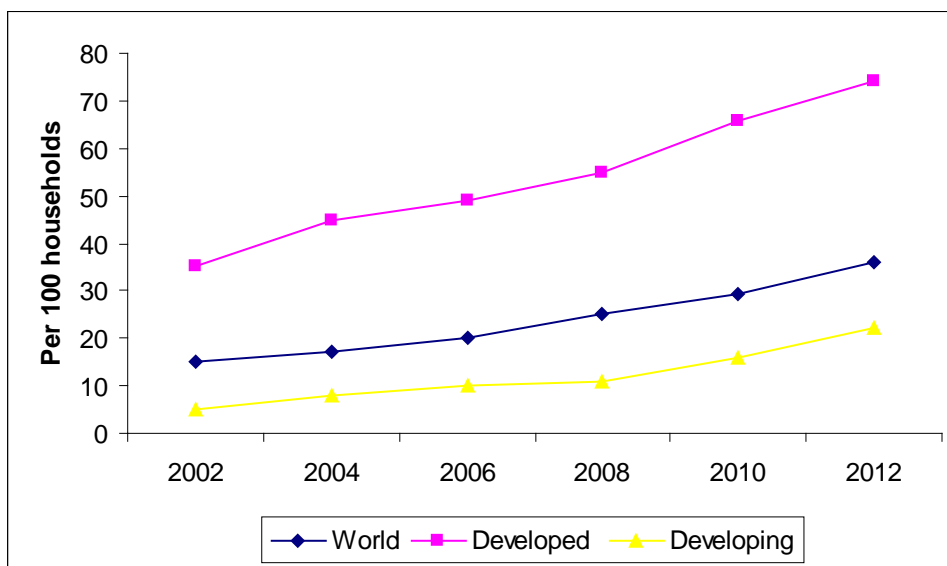
⁵ World Summit on the Information Society: Outcome documents. – ITU, 2005.

Figure 4: Internet users, penetration



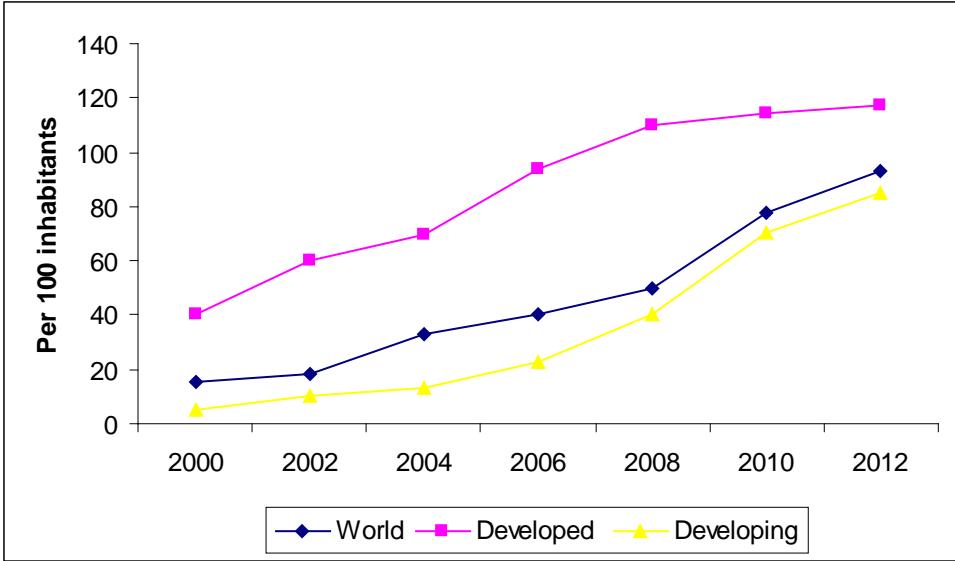
Source: www.itu.com

Figure 5: Households with Internet access, penetration



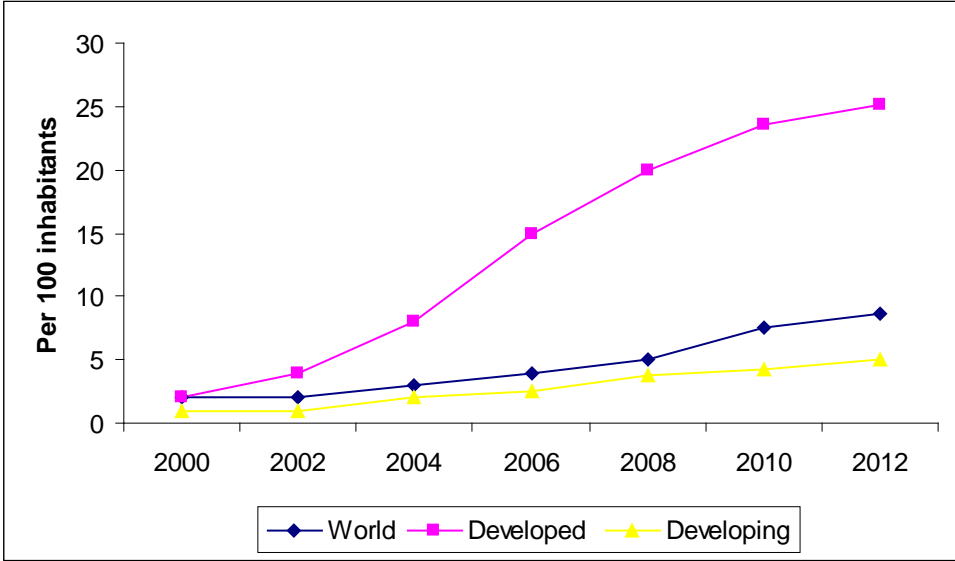
Source: www.itu.com

Figure 6: Mobile-cellular subscriptions, penetration



Source: www.itu.com

Figure 7: Fixed - broadband subscriptions, penetration



Source: www.itu.com

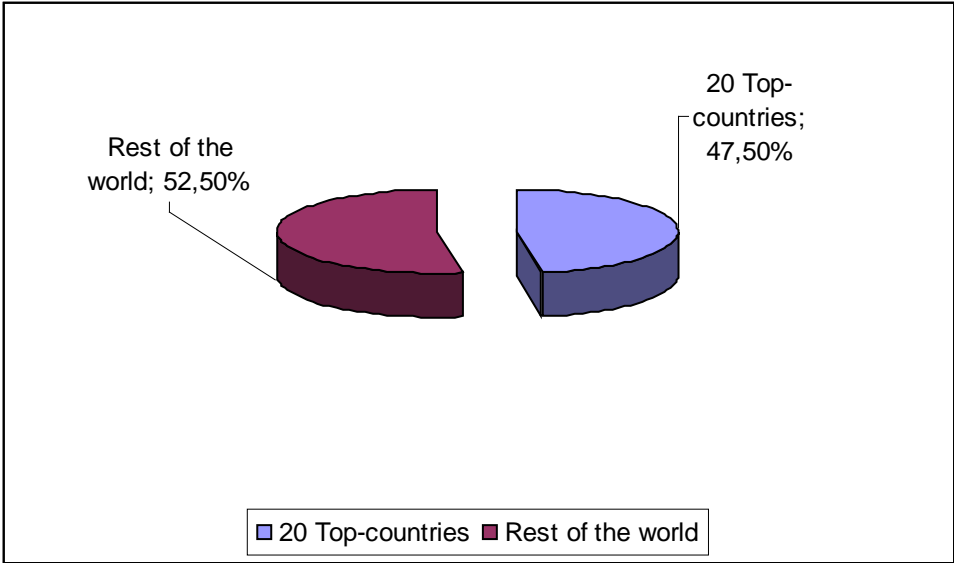
In 2000 the number of fixed broadband subscriptions in developed countries and in developing countries was almost equal (1-2 broadband subscriptions per 1000 inhabitants). After that however, the dynamics in developing countries was clearly faster. In 2012 the number of broadband subscriptions there reached 25,2 per 100 inhabitants, while in developing countries it was at the level of 5 (Fig. 7). As regards mobile cellular subscriptions, in 2000 the developed countries had a big advantage in comparison to developing countries – 40 subscriptions vs. 5 subscriptions per 100 inhabitants. In the next 12 years, the developing countries have shown real progress. As a result in 2012 the advantage of developed countries was not so obvious – 117 subscriptions vs. 85 subscriptions per 100 inhabitants (Fig. 6). As for the number of internet users, in 2000 it

was clearly higher in developed countries – 25 vs. 2 users per 100 inhabitants. In the next 12 years real progress has happened in both the developed and developing countries. However the advantage of developed countries has remained – 72 users vs. 26 users per 100 inhabitants (Fig. 5). Practically the same trends can be identified for the number of households with internet access (Fig. 4). At least the rapid dynamic has been typical during the last years for mobile-broadband subscriptions. But the advantage of developed countries remains huge – for example, 74,8 subscriptions vs. 19,8 subscriptions per 100 inhabitants (Fig. 3).

To check our hypothesis about the positive influences of ICT development on global activities we consider the shares of the top-countries with the most advanced ICT in both the world exports and the world FDI-inflows. The data of Figures 8 and 9 show that more than a half of these two types of global transactions falls on 20 of the countries with the highest levels of ICT development. These phenomena could be explained by many reasons. In our opinion, the most important explanations are:

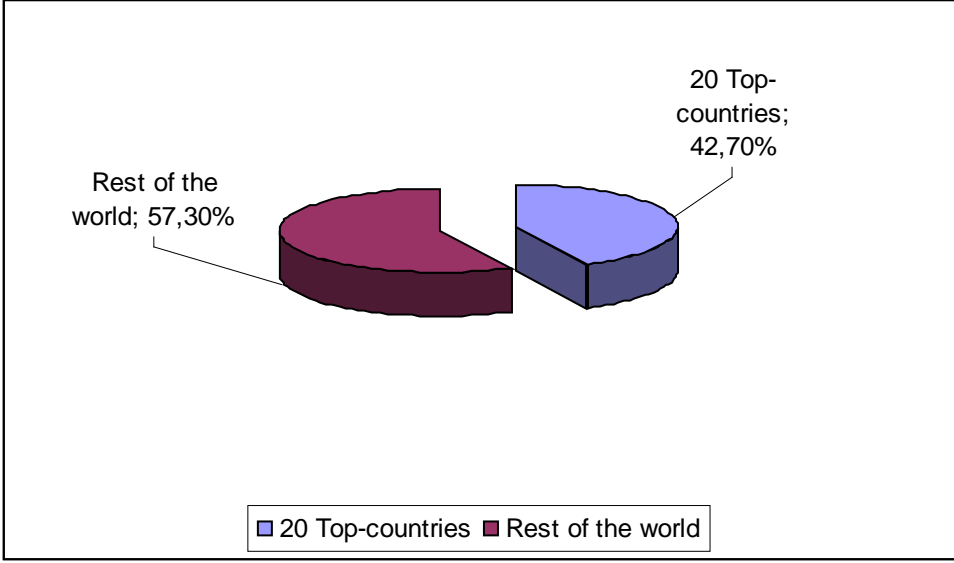
- A well developed ICT sector is generally typical for industrial countries. These countries have a relatively high level of international competitiveness. This factor seems to be very important for international trade activities. So, the countries with a good ICT infrastructure occupy strong positions in world trade.
- The development of the ICT sector contributes to the attractiveness of the national economy for FDI. International companies investing abroad often need a well developed infrastructure, which provides possibilities for researching the markets, creating business connections, money transfer and so on. The ICT sector plays an important role in this process.
- As was already mentioned, the global information space is one of the most important qualitative steps (trends) of globalization. ICT make international business connections easier. They contribute to finding partners both for international trade activities and for international direct investments.

Figure 8: Share of 20 countries with the highest level of ICT development⁶ in world exports (2011)



Sources: www.worldbank.org; www.itu.com; own calculations

Figure 9: Share of 20 countries with the highest levels of ICT development in world FDI-Inflows (2011)



Source: www.worldbank.org; www.itu.com; own calculations

So, some correlations between the development of ICT and the global activities of countries seem to be obvious. We will consider this correlation with the example of the post-socialist countries and on the example of Russia in particular.

⁶ For identification of the 20 countries with the highest levels of ICT development the ICT development index of ITU was used. In 2011 the 20 top countries were Korea (Rep.), Sweden, Iceland, Denmark, Finland, Hong Kong, Luxembourg, Switzerland, Netherlands, United Kingdom, Norway, New Zealand, Japan, Australia, Germany, Austria, United States, France, Singapore and Ireland (www.itu.com).

3. ICT development and global activities: case of post-socialist countries

All post-socialist countries had been developing within a planned economy during a period of 40-70 years. Most of them began market reforms at the beginning of the 1990s⁷. Most countries with a planned economy were closely integrated with each other. However they were, to a great extent, isolated from the rest of the world. The state had a total monopoly on all foreign trade relations. The domination of state ownership practically excluded the opportunity of foreign investments. There were no real FDI-inflows at that time.

Such forms of economic isolation led to many structural disproportions. First of all, the countries with a planned economy were practically excluded from international competition. The enterprises in many branches did not have a motivation to be competitive. Generally it was typical for manufacturing industry.

As for the development of ICT, two contradictory trends could be identified. In some countries (in particular, in the USSR), good traditions of education in mathematics and engineering sciences were typical. This could be a good basis for ICT development. However the countries with a planned economy lagged behind industrial countries in the development of manufacturing branches. The ICT sector was underdeveloped too (Gajdar, 2006). This underdevelopment remained after the collapse of the planned economy. Now the post-socialist countries do not have top positions in the Index of ICT development (Table 1). It is conspicuous that countries of Eastern Europe have a relatively higher level of ICT development in comparison with other post-socialist countries. Clear weaknesses of the ICT sector are typical for Asian countries (China, Mongolia).

Table 1: Index of ICT-development for former socialistic countries (2011)

Country	Ranking	Score
Estonia	24	6,81
Slovenia	25	6,70
Poland	31	6,19
Czech Republic	32	6,17
Lithuania	35	6,06
Russia	38	6,00
Hungary	41	5,77
Kazakhstan	49	5,27
Moldova	62	4,55
Ukraine	67	4,40
China	78	3,88
Mongolia	84	3,83

Source: www.itu.com

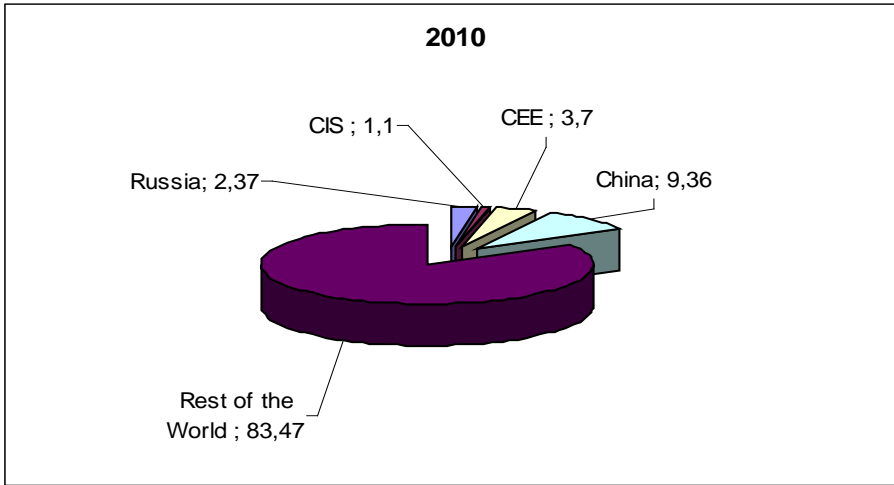
The transformation processes in post-socialist countries can be considered in a global context. The state monopoly on foreign trade was abolished. The main basis for FDI-

⁷ China is an exception in this case. The economic reform began there in 1978.

inflows was created. National financial sectors were integrated in international financial systems. Most post-socialist countries are members of the WTO. So, since the beginning of market reforms, the post-socialist countries have established a new form of external relationships with the rest of the world.

The global activities of post-socialist countries are limited (Fig. 10 and Fig. 11). Their share in world exports in 2010 was about 16,53 % (share of China – 9,36%). China seems to be the only one post-socialist country which plays a significant role on the world markets. It could be explained by some specific features of the Chinese economy (cheap workforce, favorable “price-quality” ratio and so on). So, it is possible to speak about the relatively high level of international competitiveness of China⁸. That is why China shows high volumes of exports from year to year⁹.

Figure 10: Share of former socialistic countries in the world exports (2010)

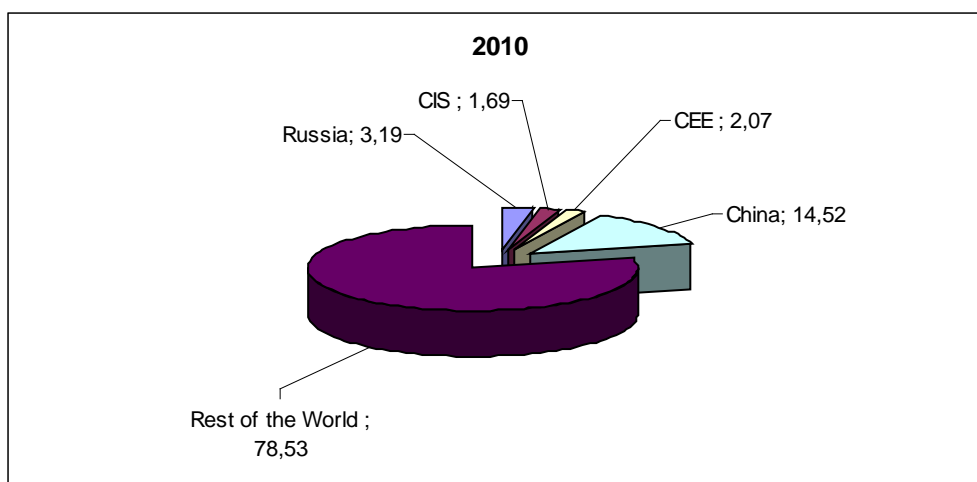


Source: www.worldbank.org; own calculations

⁸ In 2010, China exported \$ 1194 Md., down from 1429 Md. in 2008. Its main exports are electrical goods and other machinery, including data processing equipment, apparel, textiles, iron and steel, optical and medical equipment. China’s main export partners are the US (17,7%), Hong Kong (13,3%), Japan (8,1%), South Korea (5,2%) and Germany (4,1%). www.economywatch.com

⁹ Before the market reform, China was an insignificant participant in international trade. Both the liberalization of the foreign trade system and attraction of foreign investment have contributed to a changing of the situation (Fung, Iizaka, Tong, 2002).

Figure 11: Share of former socialist countries in the world FDI-inflows (2010)



Source: www.worldbank.org; own calculations

Practically the same picture is to be seen in FDI-inflows. The share of post-socialist countries in 2010 in the world FDI-inflows was about 21,47%, the share of China – about 14,52%¹⁰. Only the economy of China seems to be really attractive for FDI-inflows¹¹. The main cause of this is connected with some advantages of the Chinese economy for foreign investors¹².

As for ICT development, the ranking of China is lower than in many post-socialist countries (Table 1). However it is possible to speak about some of the progresses of China in ICT-development¹³. In general some trends can be identified:

- The post-socialist countries do not have any top positions in ICT development. Some causes are to be found in their history. The underdevelopment of manufacturing industry was generally typical for countries with a planned economy. ICT has to be considered as a part of the manufacturing industry. During the transformation stage this lag behind industrial countries has not yet been fully caught up.
- A very important part of market reforms is the reform of the system of external economic relations. However the global activities of post-socialist countries remain very limited. This is true both for volumes of exports and volumes of FDI-inflows.

So, the case of post-socialist countries generally confirms our hypothesis about some correlation between ICT development and global activities.

¹⁰ FDI-inflows in transformation countries (CEE, CIS and Russia) reduced sharply under the influence of the world economic crisis in 2008-2009 and did not restore in 2010 (Petrushkevich, 2011).

¹¹ In this case we do not take FDI per capita. However the absolute volumes of FDI-inflows are of immense importance too. They allow identifying the attractiveness of a country (region) for FDI-inflows in comparison with other regions.

¹² The promotion of FDI-inflows has been an important part of the economic reform process in China. In 1970's and early 1980's, new regulations to permit joint ventures using foreign capital were set. At the same time, Special Economic Zones (SEZ) and "Open Cities" were created (Fung, Iizaka, Tong, 2002).

¹³ According to Cheng Donghong and Jia Hepeng(2010): "a much higher proportion of people in China use information communication technologies than in any other development countries with a similar per capita income"

4. ICT development: Russian Perspectives

In terms of the key indices in the sphere of information technologies Russia has much leeway to make up in comparison with developed countries.

The leading or backward development of information society in a country is measured by several international ratings. Let's discuss the position of Russia in some of these ratings.

1. **Digital economy rankings**¹⁴ of the Economist Intelligence Unit (previously titled the "e-readiness rankings") are the annual benchmarking study that assesses the quality of a country's ICT infrastructure and the ability of its consumers, businesses and governments to use ICT to their benefit. The following scoring criteria categories with correspondent weightings are used in the research of the Economist Intelligence Unit:

- Connectivity and technology infrastructure (20%);
- Business environment (15%);
- Social and cultural environment (15%);
- Legal environment (10%);
- Government policy and vision (15%);
- Consumer and business adoption (25%).

Russia's rank in this research of 2010 is 59 out of 70 countries being analyzed (Table 2). The following criteria contributed to this low score: connectivity (3,85), legal environment (3,65), government policy and vision (3,00), and consumer and business adoption (3,01).

Table 2: Digital economy rankings of Economist Intelligence Unit, 2010

Ranking	Country	Score sum
1.	Sweden	8,49
2.	Denmark	8,41
3.	USA	8,41
4.	Finland	8,36
5.	Netherlands	8,36
...
59.	Russia	3,97

Source: Economist Intelligence Unit, 2010

2. **Networked Readiness Index**¹⁵ (NRI) has been published annually by World Economic Forum and INSEAD since 2001, accompanying and monitoring ICT

¹⁴ Economist Intelligence Unit, 2010

¹⁵ World Economic Forum, The Global Information Technology Report 2013. Growth and Jobs in a Hyperconnected World

advances over the last decade as well as raising awareness of the importance of ICT diffusion and usage for long-term competitiveness and societal well-being. Networked readiness is understood as the capacity of countries to fully benefit from new technologies in the competitiveness strategies and their citizens' daily lives. The index consists of three components:

- “Environment” – the conduciveness of national environments for ICT development and diffusion, including the broad business climate, some regulatory aspects and the human and hard infrastructure needed for ICT;
- “Readiness” – the degree of preparation for and interest in using ICT by the individuals, the business sector and the government in their daily activities;
- “Usage” – the actual use of ICT by the individuals, the business sector and the government.

Some of the parameters are calculated on the basis of international statistics and others are received on the basis of expert estimations of company managers in the analyzed countries.

Russia is ranked 54 out of 144 economies covered in the research of 2013 (Table 3). In unison with the Digital economy rankings covered above, the total score was significantly lowered by such parameters as efficiency of legal framework, government procurement of advanced technology products and the impact of ICT on new services and products. Among other parameters with unsatisfactory scores it is worth mentioning the intensity of local competition and the availability of the latest technologies.

Table 3: Networked readiness index by World Economic Forum and INSEAD, 2013

Ranking	Country	Score sum
1.	Finland	5,98
2.	Singapore	5,96
3.	Sweden	5,91
4.	Netherlands	5,81
5.	Norway	5,66
...
54.	Russia	4,13

Source: The Global Information Technology Report 2013. Growth and Jobs in a Hyperconnected World

3. **ICT Development index**¹⁶ (IDI) is prepared by International Telecommunication Union. It is a composite index made up of 11 indicators covering ICT access, use and skills:
 - Access sub-index: captures ICT readiness and includes five infrastructure and access indicators (fixed telephony, mobile telephony, international Internet bandwidth, households with computers and households with Internet);
 - Use sub-index: captures ICT intensity and includes three ICT intensity and usage indicators (Internet users, fixed broadband and mobile broadband);

¹⁶ ITU, Measuring the Information Society, 2013

- Skills sub-index: captures ICT capability or skills as indispensable input indicators and includes three proxy indicators (adult literacy, gross secondary and tertiary enrolment).

According to the data of 2012, Russia has a received total rank of 40 out of 157 countries covered in this research (Table 4). The skills sub-index was evaluated relatively high (8,8), while the use sub-index (4,34) diminished the total evaluation of the country.

Table 4: ICT development index by the International Telecommunication Unit, 2012

Ranking	Country	Score sum
1.	Korea	8,75
2.	Sweden	8,45
3.	Iceland	8,36
4.	Denmark	8,35
5.	Finland	8,24
...
40.	Russia	6,19

Source: ITU, Measuring the Information Society, 2013

Digital divide can be observed not only between Russia and advanced economies but also between regions and economic branches within Russia. The *inclusive information society* has not yet been formed in Russia. This digital divide can be analyzed with the help of data from the Institute of Information Society¹⁷, which has calculated an Index of Russian regions e-readiness since 2005.

The index represents a measurement of the level of readiness for full-scale ICT usage for the sake of social and economic development of different regions. Since the moment of its creation, the index has become an important analytical instrument for elaborating and carrying out regional policy of information society development.

77 parameters form the index. These are the main parameters of access to and usage of ICT recommended by international organizations. These parameters characterize the following aspects of information society development:

- information and communication infrastructure;
- human capital;
- economic environment,

as well as usage of ICT for development purposes:

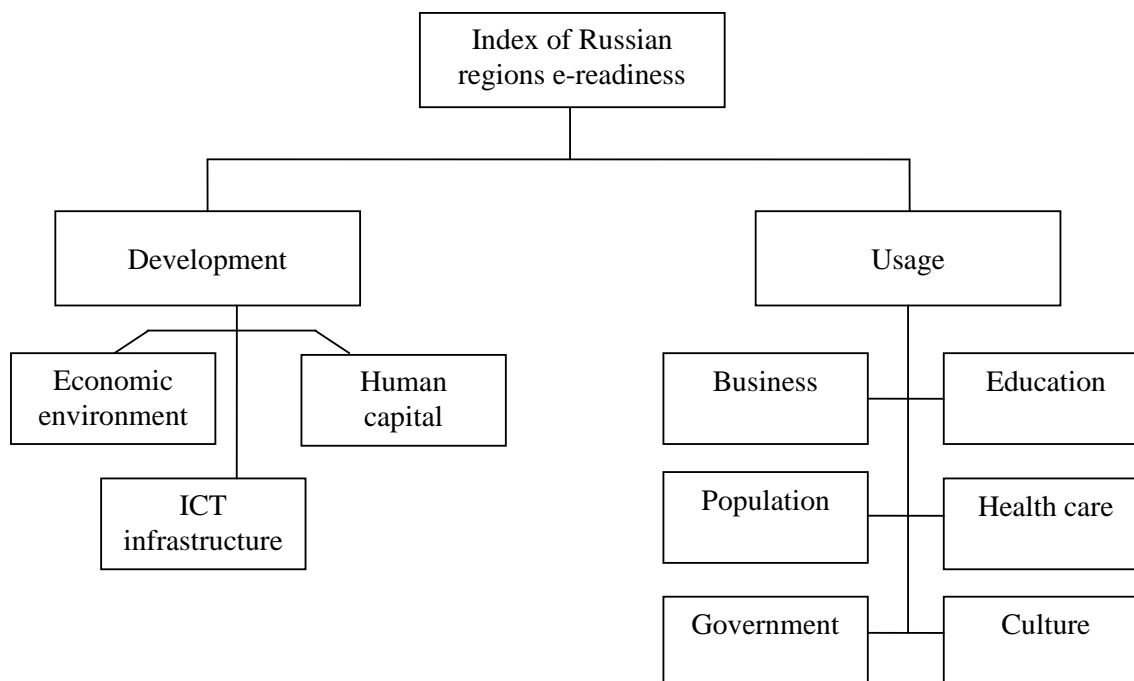
- in business;
- by state and municipal authorities;
- in health care;
- in cultural sphere;
- in education;

¹⁷ www.eregion.ru

- by population in households.

The structure of the Index is presented on Figure 12.

Figure 12: Index of Russian regions e-readiness by the Institute of the Information Society



Source: eregion.ru

Table 5 shows the Index of Russian regions e-readiness in 2010-2011. The leaders of this rating are Russian regions with a high volume of gross regional product where the authorities carry out purposeful policy aimed at the development of information society as well as regions with a high level of human capital development.

Table 5: Russian regions with the highest e-readiness index, 2010-2011

Ranking	Country	Score sum
1.	Moscow	0,683
2.	St.Petersburg	0,612
3.	Tumen	0,540
4.	Yamal-Nenets Area	0,513
5.	Khanty-Mansi Area	0,510
6.	Tomsk	0,507
7.	Murmansk	0,464

Source: eregion.ru Digital divide between Russian regions is vividly illustrated by Tables 6 and 7. In these tables, the digital divide is measured as a ratio of maximal value of a parameter to its minimal non-nil value among Russian regions.

Table 6: Digital divide in Russia: the gap between the aggregated parameters, 2010-2011

Factors	Minimal value in Russia	Maximal value in Russia	Digital divide
Development factors	0,205	0,755	3,675
ICT infrastructure	0,118	0,606	5,150
Human capital	0,077	0,976	12,628
Economic environment	0,330	0,856	2,595
ICT usage factors	0,179	0,612	3,425
Individual usage	0,313	0,791	2,526
Business usage	0,209	0,624	2,986
Governmental usage	0,159	0,704	4,428
Usage in health care	0,162	0,537	3,305
Usage in education	0,159	0,637	4,005
Usage in culture	0,027	0,608	22,519

Source: www.eregion.ru

Digital gap between Russia and developed countries as well as between Russian regions is a consequence of a range of economic reasons (the long-lasting crisis of the Russian economy in the 1990's, low level of incomes of the majority of the population). However, the insufficient development level of ICT in Russia is compounded by several factors hindering the creation and the effective application of ICT in the economy. The following factors could be named:

- an incomplete regulatory environment created without regard to opportunities provided by modern ICT;
- an insufficient development of e-government;
- a lack of holistic information infrastructure and effective information support for product and service markets, including e-commerce;
- a high level of monopolization of communication networks hindering their multi-purpose application and resulting in disproportions of prices.

Table 7: Digital divide in Russia: the gap between selected individual parameters, 2010-2011

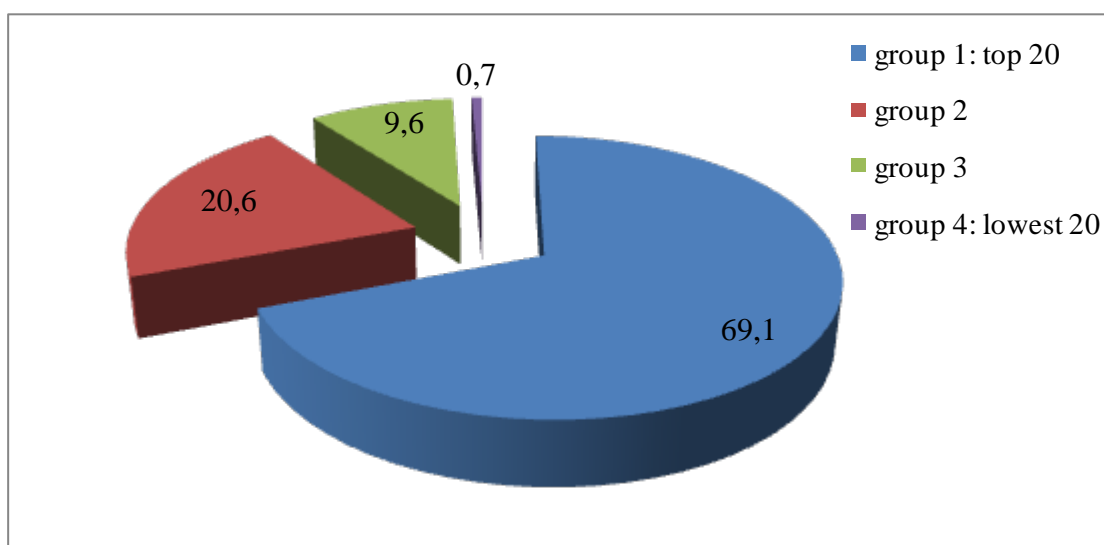
Factors	Minimal value in Russia	Maximal value in Russia	Digital divide
Sub-index "Human capital"			
Number of students per 1000 inhabitants	9,67	101,12	10,46
Number of ICT graduates per 10000 inhabitants	0,13	31,69	243,77
Number of researchers per 10000 inhabitants	0,21	117,31	558,62
Sub-index "ICT infrastructure"			
Mobile communications penetration per 100 inhabitants	104,6	224,4	2,15
Number of PC per 100 inhabitants	6,42	65,54	10,21
Share of adult population using Internet, %	14,80	66,00	4,46
Sub-index "Business usage"			
Share of companies having CRM or supply management systems, %	14,89	55,29	3,71
Share of companies having ERP-systems, %	1,60	18,90	11,81
Share of companies having websites, %	4,26	69,33	16,27
Sub-index "Usage in education"			
Number of PC with Internet access per 100 school pupils	0,41	16,74	40,83
Share of schools having websites, %	8,84	100,00	11,31
Share of schools having e-libraries, %	4,42	100,00	22,62

Source: www.eregion.ru

We have seen that the countries leading in ICT development also play the most important role in international economic activities. Large differences between Russian regions in terms of their ICT development give rise to the same question concerning their role in foreign trade and the attraction of foreign direct investment. The same approach as taken in Figures 8 and 9 was used where the share of the top 20 countries leading the ICT development in world trade and FDI-inflows was calculated.

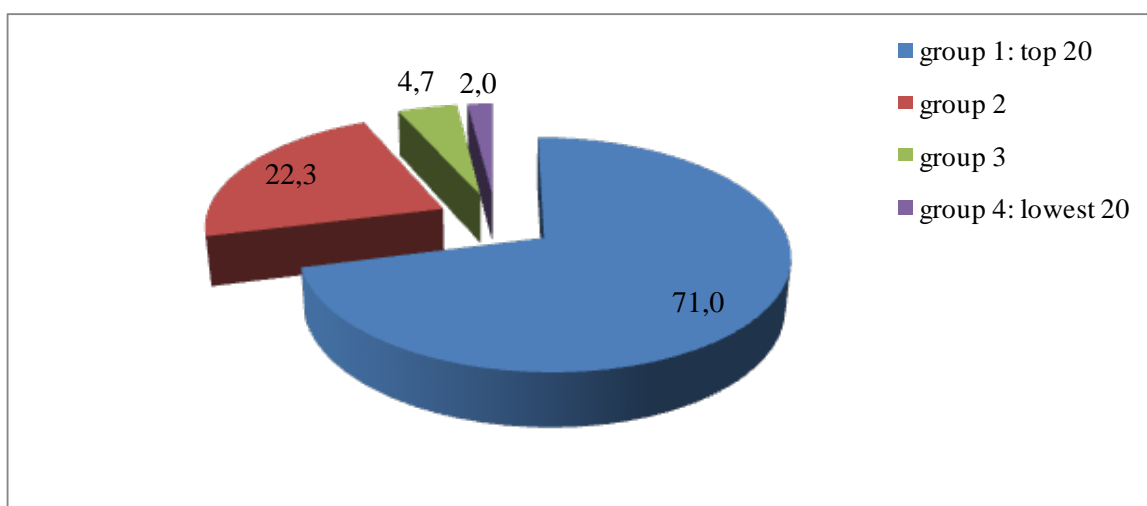
There are 80 regions in Russia. So, four groups were formed based on the level of ICT development with 20 regions each. The share of each group of total Russian exports, imports and FDI-inflows is shown on Figures 13-15.

Figure 13: Share of regional groups in total Russian exports, 2011, %



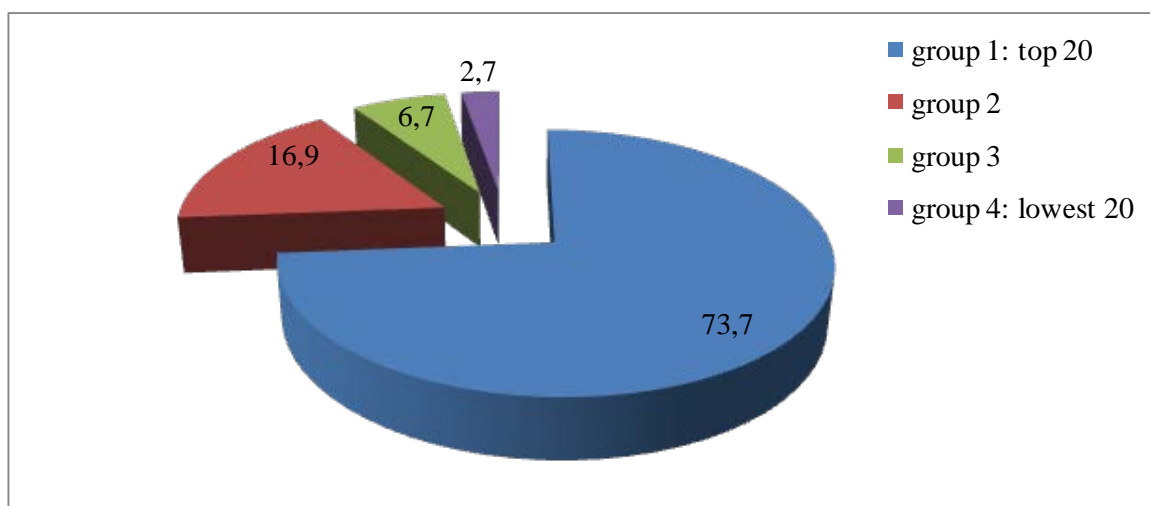
Sources: www.eregion.ru; www.gks.ru; own calculations

Figure 14: Share of regional groups in total Russian imports, 2011, %



Sources: www.eregion.ru; www.gks.ru; own calculations

Figure 15: Share of regional groups in total Russian FDI-inflows, 2011, %



Sources: www.e-region.ru; www.gks.ru; own calculations

A correlation between the e-readiness of Russian regions and their role in international economic activities is obvious: the top 20 regions¹⁸ leading the e-readiness index account for 69,1% of total Russian exports, 71,0% of total Russian imports, and 73,7% of total foreign direct investments attracted by the Russian economy. On the contrary, the most backward 20 regions¹⁹ with the lowest e-readiness results account only for 0,7% of exports, 2,0% of imports, and 2,7% of FDI inflows. This data confirms our hypothesis about the interdependence of information society development and scope of foreign economic activities also in the case of different Russian regions: the regions leading in e-readiness rating are also dominating in foreign trade and foreign direct investments attraction.

At present, a range of conceptual documents and federal programs were adopted in Russia that are oriented towards information society formation. These are, in particular, the Targeted Federal Program “Electronic Russia (2002-2010)” and “Strategy for Information Society Development in the RF” adopted in 2008. In the same year a Presidential Council for Information Society Development was created. According to the Strategy for Information Society Development in the RF, by 2015 Russia should be among the top 20 countries in the main international ratings measuring information society development. To achieve this goal, the state measures aimed at legislation improvement, youth education

¹⁸ The top 20 Russian regions in ICT development (2010-2011) are Moscow, St.Petersburg, Tumen, Tomsk, Murmansk, Khabarovsk Territory, Kamchatka, Sakhalin, Tatar Republic, Novosibirsk, Republic of Karelia, Magadan, Samara, Krasnoyarsk, Nizhny Novgorod, Chukotka Area, Moscow Area, Jaroslavl, Kaluga, Leningrad Region

¹⁹ The 20 Russian regions with the lowest e-readiness index (2010-2011) are Kirov, Kurgan, Jewish Autonomous Region, Tambov, Orel, Altai Republic, Kostroma, Republic of North Ossetia, Amur region, Kursk, Trans-Baikal Territory, Republic of Adygea, Bryansk, Kabardino-Balkar Republic, Republic of Kalmykia, Republic of Tyva, Republic of Dagestan, Karachai-Cherkess Republic, Republic of Ingushetia, Chechen Republic

and research support are needed as well as a new orientation of business, which should take into consideration in their strategic planning the new informational era meaning new macroeconomic conditions of their growth.

5. Conclusions

Thus, the rapid growth of ICT during the last decades suggests the beginning of the new stage of global economic development, which is often referred to as “new economy”. Information and communication technologies become a key factor supporting economic progress both within national economies and on the global level. Our main hypothesis is that the development of ICT and global activities of both countries and regions are positively correlated. The data of Figures 1-15 confirm practically this hypothesis. So, the post-industrial countries which have top positions in Indices of ICT development account for more than half of world exports. These countries are most attractive for FDI-Inflows. As for post-socialist countries, the level of ICT development there is, in spite of some differences, generally lower in comparison with the top countries. Their global activities (exports and FDI-inflows) are relatively limited too.

Russia still lags behind the leading post-industrial countries. Moreover, there are considerable gaps in the levels of ICT development between Russian regions. That is why ICT development should become one of the main orientations of Russian economic policy in the nearest future. However, the regional aspect has not received much attention in the strategic documents paving the way for Russia towards the information society. There might be different approaches towards regional policy in supporting advances in ICT. One of them might be even (“fair”) support to all regions disregarding their level of present development. Another would be targeted development of ICT in the backward regions in order to provide population in these regions more opportunities for self-realisation and the creation of new businesses. A third one might be more active state policy oriented towards cluster formation in the most advanced regions to reach higher efficiency and global competitiveness on ICT markets. The decision about the concrete type of the regional ICT policy should be based on deeper research. More data about the different regions should be analyzed systematically, including demographical characteristics and the structure of gross regional products and export / import operations. Such analysis would show groups of regions with different patterns of interdependencies between levels of ICT and economic development and different requirements from economic policy. The economic policy aimed at ICT development should take into consideration three types of ICT users: households, business, and the state. These users are analyzed in all information society ratings mentioned above. So, the measures can be categorized according to these three target segments:

- The state should be considered as a leading user providing a high quality of e-government sources, setting the standards for the private sector and motivating the population to learn ICT basics;

- The support for companies could be carried out in different ways, including supporting entrepreneurship in the ICT sector and creating public-private partnerships in the development of broadband and mobile Internet infrastructure;
- The population in Russia has a high acceptance of new technologies, so the main focus can be on education development.

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