

Post-Soviet countries: the journey from resource-driven economies to knowledge based-economies. Focus on ICT sector

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Abstract. *After the dissolution of USSR the Soviet republics' economies were resource-driven, but only few of them were rich in highly tradable natural resources. They were Russia, Azerbaijan, Ukraine and Kazakhstan. These countries had registered an important economic growth due to natural resources exports, but became prisoners of the so called "Dutch disease". Moldova, Georgia, Armenia, Belarus or Baltic States hadn't any highly tradable natural resources such as oil or gas and had to focus on developing other sectors of economy and have set as a priority the development of ICT sector. The purpose of my study was to find out who has performed better in developing the ICT sector from ex-Soviet republics, what is the correlation between the ICT sector development and the abundance in natural resources. Will the thesis that countries rich in natural resources are less open to knowledge and innovation be confirmed?*

Keywords: ICT sector, post-Soviet countries, natural resources, Dutch disease, resource-driven economies

JEL Codes: O13, O33, O57, P270.

1. Introduction

When leaving the "USSR yard" (or USSR camp, in other's vision), many of Soviet republics' economies, where resource-driven. What was before "shared" between the sister-republics had to be sold at profitable prices on a free market. It became quickly obvious for the new countries that their products are not enough competitive for the external markets. Only natural resources still had their clients abroad, even if the price for raw materials was low and fluctuant. Besides that, countries like Moldova, Georgia, Armenia, Belarus or Baltic States hadn't any highly tradable natural resources such as oil or gas. Others, like Russia, Kazakhstan, Azerbaijan or Ukraine in some extent had exploited inefficiently their natural resources and had become prisoners of the so called "Dutch disease"¹. Only in the past 10 years the government of these countries, becoming aware of the pitfall to remain dependent only on natural resources without diversifying their economies had started to elaborate and implement strategies in order to reverse "the curse of natural resources"². When post-Soviet countries started to develop their economies under the rules of market

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¹ Resource-led export booms have often led to exchange-rate appreciation that has made other sectors, including manufacturing, less competitive in world markets and has led to domestic cost inflation. Such effects have been dubbed "Dutch disease," an expression coined by The Economist in 1977.

² Globally almost 80 percent of resource -driven countries have below average levels of income; more than half of these are not catching up – as per Richard Dobbs, Jeremy Oppenheim, Adam Kendall, Fraser Thompson, Martin Bratt, and Fransje van der Marel, *Reverse the curse: Maximizing the potential of resource-driven economies*, McKinsey Global Institute Report December 2013, exhibit 8)

economy, they found it too difficult and maybe too late to develop some economic sectors where the western economies had already a long and successful history in background such as manufacturing and the majority of services sectors. Having lost that train, some of them understood that there is one they still can catch and compete with western economies and that was the IT sector. So they have started the “journey” from resource-driven economies to knowledge-based economies. It is interesting to see if and who from these countries have reached the destination or are closer to it. In this research I have tried to find out who has performed better in developing the ICT sector from ex-Soviet republics, what is the correlation between the ICT sector development and the abundance in natural resources. Will the thesis that countries rich in natural resources are less open to knowledge and innovation be confirmed?

2. Methods and data

This study aims to confirm or infirm the thesis: *that countries rich in natural resources had developed less successfully their ICT sectors*. It will be focused on 10 ex-Soviet republics: Armenia, Azerbaijan, Belarus, Estonia, Georgia, Lithuania, Latvia, Moldova, Russian Federation and Ukraine which had become independent states after USSR dissolution, in 1991. I didn't include in my study the other 5 former Soviet republics from Central Asia: Kazakhstan, Turkmenistan, Kyrgyz Republic, Tajikistan and Uzbekistan because of the lack or very scarce information on ICT sector in these countries.

After gathering the information on available indicators related to ICT sector development from World Bank, IMF, WTO, UNCTAD, Eurostat and official statistical sites of analyzed countries, I have decided to focus on the following indicators:

- ICT share in GDP;
- ICT services export share in total exports;
- ICT services export share in GDP;
- Share of people employed in ICT activity on total employed people

The year of reference I've chosen to analyse is 2012 (for some indicators is 2013). This is the year with most statistical data available for the majority of analyzed countries and a year when these countries have celebrated their age of majority as independent states.

I have selected the indicators mentioned above because they reflect in my opinion more objectively the performance and the results of ICT sector independently from the country's overall economic development. Other ICT indicators which are often used when assessing a country's ICT capabilities are the ICT infrastructure and access, ICT access and use in households, ICT use in business, but all of them are more related to the infrastructure required to develop ICT sector and not so much to the ICT sector's “final product”. These indicators are also important because they actually ensure the basis for ICT sector development and it is worthy to be mentioned that in the majority of analyzed countries these indicators are at a good level, if compared to global statistics. The ICT infrastructure was almost inexistent at the beginning of 90's in post-Soviet countries, therefore these countries have built it using the newest technologies and now, in many of them, some digital indicators such as internet connection speed or broad band coverage are at a higher level even than in the western countries as per statistics provided by OECD (Organization for Economic Cooperation and Development)³.

Another commonly used benchmark is the ICT expenditures (ICT spending in per capita and absolute terms and as a percentage of GDP), but this indicator depends too much on country's policymakers and was

³ <http://www.oecd.org/sti/broadband/oecdbroadbandportal.htm>

very fluctuant in the past decades depending on countries' economic priorities, that's why I will not use it in my analysis.

I will present bellow the data source and methods of calculation of analyzed indicators.

2.1. ICT share in GDP

It was difficult to assess even such a generally used indicator for the economy, because ICT sector is not analyzed as a separate economic sector indicator in the official statistical reports. Therefore this indicator has been gathered from different sources, mostly from information provided by IT associations from these countries. However it was important, in my opinion to analyze the ICT sector as a share from GDP, because due to the totally different size of analyzed economies, if calculated in absolute terms it won't reflect the reality.

2.2. ICT Services Exports share in Total Exports

This indicator was analyzed separately for 2012, but also for 2005, 2010 and 2011 in order to notice the tendency. The data has been retrieved from World Bank Exports Statistics and calculated by dividing ICT services exports (BoP, current US\$) on Exports of goods and services (BoP, current US\$) ⁴.

2.3. ICT services exports on GDP

This indicator will help us to see what is the influence of ICT sector exports on country's revenue reflected in GDP, but also to see if the concerns of many economists that GDP of Russia, Azerbaijan or Ukraine is highly dependent on natural resources exports and these countries should pay more attention on diversifying their "export bucket" also by exporting more ICT services, are justified. The data on ICT services exports have been retrieved from International Monetary Fund, Balance of Payments Statistics Yearbook and Data Files corroborated with Data from Database: World Development Indicators, for the GDP of each analyzed country.

2.4. Share of people employed in ICT activity on total employed people

This indicator has been calculated with the information gathered from various sources. For Armenia, Belarus, Moldova and Ukraine the figure of total employees in ITC was provided by the Report provided by EU –Eastern Europe and Central Asia, Gateway for ICT Research and Innovation, EAST HORIZON⁵ which I have divided on total employed people, figure retrieved from official statistical sites of these countries. The data for Estonia has been retrieved from Digital Agenda 2020 for Estonia issued by the Ministry of Economic Affairs and Communications⁶. For Latvia, the most recent figure I could find was for 2010 and it has been provided in Eurostat report - Percentage of the ICT personnel divided on total employment figure from the official statistical site of Latvia⁷. For Azerbaijan the Indicator was calculated by dividing the number of people working in Information and Communication sector as per official statistical site⁸ on the total number of employed people. The figure for Russia is calculated as per the data from the Russian IT Association Report⁹ divided to the total number of employed people in 2011 as per official statistical site¹⁰.

⁴ Data source is <http://data.worldbank.org/indicator/BX.GSR.GNFS.CD/>

⁵ Available on <http://eeca-ict.eu/countries/http://eeca-ict.eu/countries/>

⁶ Available on https://e-estonia.com/wp-content/uploads/2014/04/Digital-Agenda-2020_Estonia_ENG.pdf.

⁷ Available on <http://www.csb.gov.lv/en/dati/statistics-database-30501.html>. For Lithuania the figure was provided in the article <http://www.lithuaniatribune.com/62925/lithuanias-ict-sector-amongst-the-most-attractive-in-central-and-eastern-europe-201462925/>

⁸ <http://www.stat.gov.az/indexen.php>

⁹ APKIT in collaboration with McKinsey & Company, Report on "The Measures for IT Sector Development in Russian Federation. A Business Community Approach", November 2012, Moscow retrieved from www.apkit.ru/files/Strategy_APKIT_2012_vr.pdf and http://www.gks.ru/bgd/regl/b12_04/IssWWW.exe/Stg/d03/2-rin-trud.htm page 31

3. Results and analysis

The analysis of first indicator shows that indeed **the ICT share in GDP** of resource-rich countries such as Russia, Azerbaijan or Ukraine is under 2%, while in Armenia is 2%, in Belarus – slightly above 3%, in Latvia and Lithuania is 3,7% and the champions in this rating are Estonia and Moldova with almost 5 and 9% accordingly (see table 1). Unfortunately, this indicator is not available for Georgia.

Table 1

Ranking	Country	% ICT share in GDP	source
1	Moldova	8,9	http://eeeca-ict.eu/countries/
2	Estonia	4,9	http://estonia.eu/about-estonia/economy-a-it/economy-in-numbers.html
3	Latvia	3,7	http://www.liaa.gov.lv/trade/industry-profiles/information-and-telecommunications-technology-industry
4	Belarus	3,1	http://eeeca-ict.eu/countries/
5	Lithuania	3,1	Investment possibilities in Lithuania - Innovation Circle
6	Armenia	2	http://eeeca-ict.eu/countries/
7	Azerbaijan	1,9	http://eeeca-ict.eu/countries/
8	Russian Federation	1,3	http://www.gazeta.ru/business/2012/10/29/4827945.shtml
9	Ukraine	1,24	http://www.unn.com.ua/ru/news/1318416-chastka-it-u-vyp-ukrayini-torik-sklala-1-24

While Estonia is being already recognized as an “IT tiger” of Eastern Europe, the high influence of ICT sector on Moldova’s economy may be surprising for many. One may argue that ICT sector has such a great influence on Moldova’s GDP only because other economic sectors have very low performance. Even though, the fact that ICT shows good performance can be an important step for the economic long-term development of this country, as ICT sector, in opposition with mining sector for example, is recognized for bringing qualitative and sustainable growth.

The fact that ICT sector brings only 1% to Russia’s GDP while the contribution of natural resources to GDP as per World Bank Data¹¹ is above 18% is not seen as a good proportion by the Russian policymakers and strong strategies are elaborated and implemented in order to boost the ICT sector in Russia so that, by 2020 this indicator should get to 4% according to APKIT and McKinsey analysis from 2012.

Far more alarming is the comparison of Natural resources share in GDP vs ICT share in GDP is in Azerbaijan, where the difference between 38,5% and 1,9% respectively talks by its self (see Figure 1).

¹⁰ http://www.gks.ru/bgd/regl/b12_04/IssWWW.exe/Stg/d03/2-rin-trud.htm

¹¹ <http://wdi.worldbank.org/table/3.15>

Azerbaijan government has acknowledged this macroeconomic imbalance and has set an ambitious target to grow the ICT sector share in GDP which should reach 9% by 2020¹².

Ukraine, even if considered to be still a resource driven economy¹³ has a much less disproportion between the contribution of natural resources and ICT sector to country's GDP (see Fig. 1)

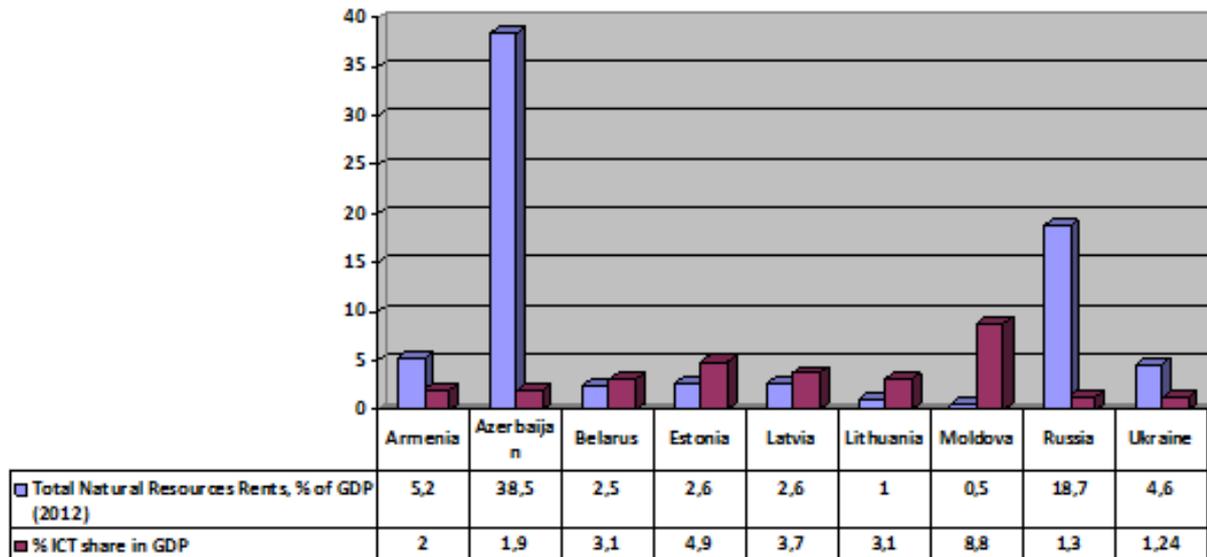


Fig. 1: Share of Natural Resources Rents in GDP vs ICT share in GDP (2012)

ICT services exports share in GDP (year of reference 2013) indicator has been calculated by dividing ICT service exports (BoP, current US\$) by country's GDP. This indicator is reflected in Figure 2.

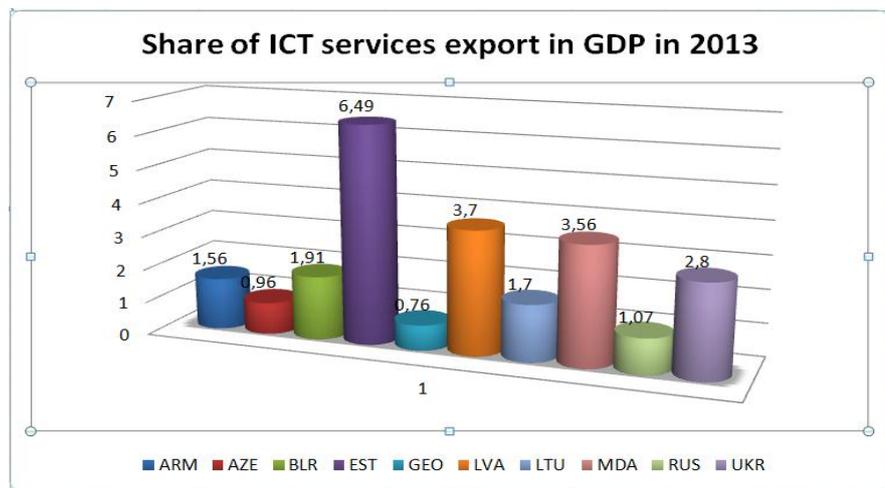


Fig. 2: Share of ICT services export in GDP in 2013

¹² <http://www.trend.az/business/it/2266546.html>

¹³ According to Nataliya Bezrukova; Vitaliy Svichkar DUTCH DISEASE IN UKRAINE: ASSESSMENT OF THE DOMESTIC EXPORT PROBLEMS Source: Economic Annals-XXI (Економічний часопис-XXI), issue: 07-08(2) / 2014, pages: 4-7, retrieved from www.ceool.com

This indicator is highest in Estonia, seconded by Latvia and Moldova. Russian Federation and Azerbaijan are occupying the last positions, repeating the ranking of the first indicator (ICT on GDP). Thus, this indicators is also confirming the thesis that countries rich in natural resources have less developed their ICT sector.

Share of ICT Services Export in Total Exports indicator shows that Moldova, Estonia and Latvia perform better when we talk about ICT services exports. Good performance on this indicator is also shown by Armenia. In Belarus, Lithuania and Georgia, this indicator situates near 2% which means that the ICT services export doesn't have a significant impact on these countries' economies.

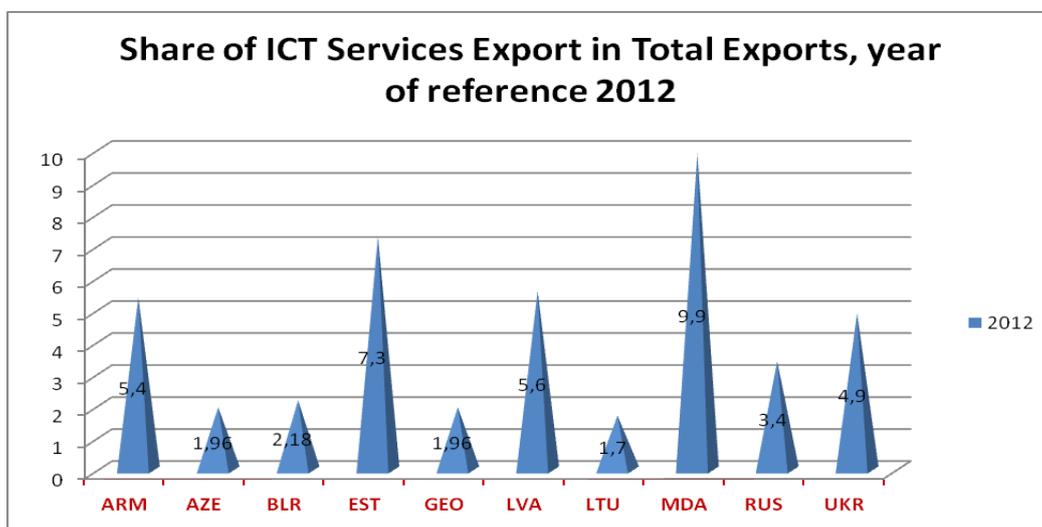


Fig. 3: Share of ICT Services Export in Total Exports, year of reference 2012

When talking about resource driven economies, which are as per criteria singled out by McKinsey & Company, Inc.¹⁴ (2012) countries where the resource export (oil, gas, minerals) makes up more than 20% of exports of the total country exports such as Russia, Ukraine and Azerbaijan, this indicator is at a lower level. However these countries are aware of the risk on remaining dependent on natural resources exports, therefore they have implemented strategies for diversifying their “export bucket”. One of these strategies is related to ICT sector development. In Ukraine, these strategies have started to show some results and this is reflected by the relatively higher level of ICT services export share in total exports, which has reached almost 5%. We see that Ukraine has performed better in diversifying its export by increasing the ICT services exports share also when analyzing the dynamics of this indicator, starting from 2005 (figure 4).

While in absolute terms Russia exports more ICT services than other countries from the region if calculated as a share from total exports it is only 3,4%, a figure that is still very low when comparing to 64% representing the share of natural resources exports in total exports.¹⁵

¹⁴ Richard Dobbs, Jeremy Oppenheim, Adam Kendall, Fraser Thompson, Martin Bratt, and Fransje van der Marel, *Reverse the curse: Maximizing the potential of resource-driven economies*, McKinsey Global Institute Report December 2013

¹⁵ according to <http://www.resourcegovernance.org/countries/europe/russia/overview>

Azerbaijan has absolutely alarming situation when we talk about export diversification, the ICT service export share is only 1,96% while share of extractive exports in total reaches 95% (!)¹⁶

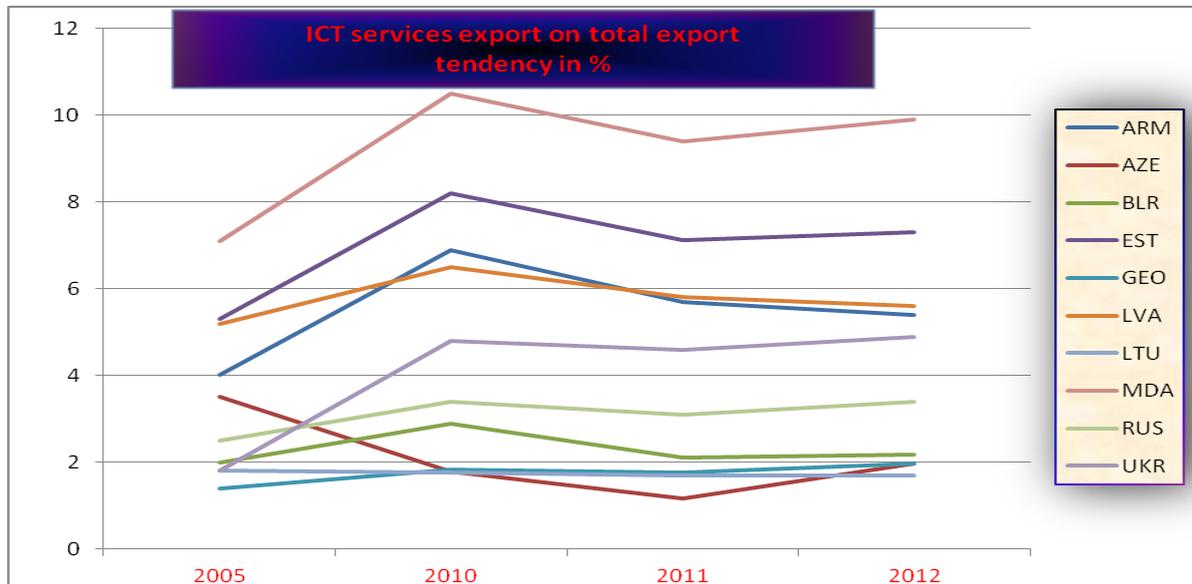


Fig. 4: ICT services export on total export tendency in %

Figure 4 shows also that almost in all 10 analyzed countries starting from 2005 there is a tendency to increase the share of ICT services export in total exports, and only in Azerbaijan, the indicator in 2012 was at a lower level than in 2005.

Share of people employed in ICT indicator grants the leadership again to Estonia, where 4% of total employed people are working in ICT sector, seconded by Moldova with 3% and Belarus with 2,2%. In other analyzed countries this indicator is under 2%, as shown in the figure bellow.

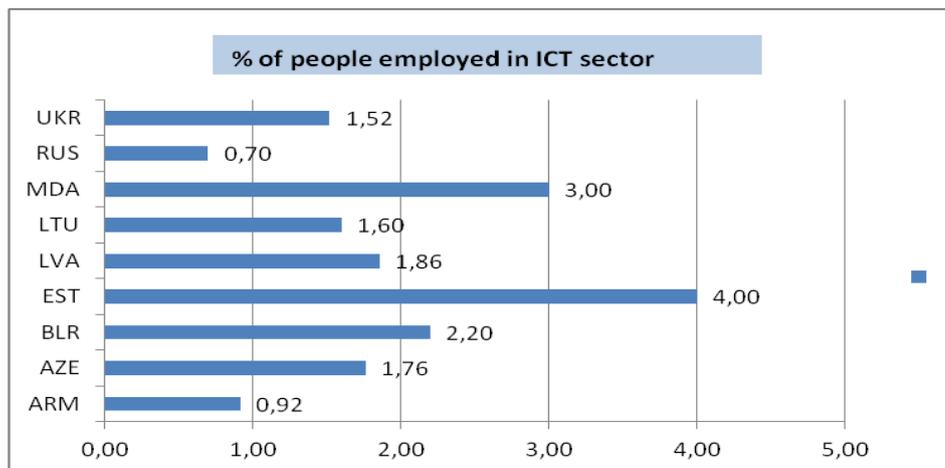


Fig. 5: % of people employed in ICT sector

¹⁶ according to <http://www.resourcegovernance.org/countries/eurasia/azerbaijan/overview>

This indicator isn't very homogeneous, because in some statistics it includes only the persons working in IT sector, in other this figure includes all employees with ICT related activities across all labour market, but still it is an important benchmark when analyzing the ICT sector development. It is notable that this indicator has the highest levels in Estonia and Moldova and lowest, in Russia and it is also low in Ukraine and Azerbaijan, confirming the correlation noticed also in the analysis of the previous indicators. The countries rich in natural resources have a less developed ICT sector, also from the ICT employment point of view.

ICT employment indicator is important to be analyzed not only from the perspective of the added value to the economy, there is another significant aspect related to ICT jobs. First of all we should outline the quality of these jobs. As per Chris Vein, World Bank Chief Innovation Officer for Global ICT Development these are "good jobs, which have positive economic and social implications for workers and society". Hence, the ICT sector has also a very positive social impact, reducing the gap between the poor and rich, and contributing to the creation or consolidation of the middle class. On the contrary, in the resource driven economies, exploitation of natural resources had, in the majority of cases, a negative social impact, by allowing a small group of persons to benefit from them, see the cases of oligarchs in Russia and Ukraine.

4. Discussions and conclusions

Having in mind the Millennium Development Goals which have demonstrated that the ICT sector had an important impact on combating the poverty, but also the Europe 2020 targets, especially when referring to R&D and innovation, the Baltic states, but also Moldova, Ukraine and Armenia have developed strategies to boost the ICT sector development. The analysis of indicators has proven that the progress has already shown up in the Baltic States and Moldova and good results are starting to appear in Ukraine, Belarus and Armenia. Russian Federation has also adopted a strong strategy for developing the ICT sector and even Azerbaijan, the most dependent on natural resources country from the analyzed pool is working on strategies for boosting the ICT sector. But, the evidence is that countries rich in natural resources have registered a much lower progress if comparing with the others from the analyzed pool.

As stated also in McKinsey Global Institute Report (2013): "Bluntly, too often an abundance of resources has not enhanced economic development, but impeded it". Resource rich countries haven't managed to ensure that their resource wealth is used for productive long-term investment that creates clear benefits for a large share of the population. These countries have often failed in spending wisely the benefits coming from abundance in natural resources for many reasons, including because of corruption and macroeconomic instability.

Another discussion that can emerge from this study is what should be the role of the state in developing the ICT sector in analyzed countries, in converting their resource endowments into long-term prosperity. It is clear that the ultraliberal approach "that any measure taken by the state for resolving a economic or a social problem has more negative than positive effects"¹⁷ is not to be followed in this situation as relying on the "spontaneous harmony" in countries rich in natural resources is not an option. It has been already proven that the capitals and human resources will tend to go to the oil and gas and mining sectors, where they can get easier and quicker material advantages. People, will always try to get maximum advantages with minimum effort. That is why it is important for the governments of these countries to play a role in redirecting the main

¹⁷ Francisco Vergara "Temeiurile filozofice ale liberalismului", Ed. Nemira, 1998.

business forces and capitals into the ICT sector, determining them to invest more time and resources in innovation activities.

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