

Czech University of Life Sciences Prague
Faculty of Economics and Management
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Diploma Thesis

Infrastructure development in Georgia

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CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

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DIPLOMA THESIS ASSIGNMENT

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Economics and Management

Thesis title

Infrastructure development in Georgia

Objectives of thesis

The main aim of this thesis is to analyze the influence of developing infrastructure on GDP growth and development in the country. The main aim will be fulfilled by partial aims:

1. Provide practical and theoretical knowledge for the people in developing countries about infrastructural development
2. Show examples of the sustainable development of infrastructure
3. Compare infrastructure of the different countries
4. Give recommendations to the governments of developing countries in specific regions – Caucasus

Methodology

This thesis will be divided into three parts.

The first part is a theoretical one and will be based on literature search. It will define the current state of knowledge in the field of infrastructure development with the overlap to its influence on economic growth and development.

The second part will rely on the theoretical part and it is the key component of the thesis. The author will use method of quantitative research such as statistical and mathematical methods. The research will use secondary sources of information. (UN, IMF, World Bank, national statistical office, etc.)

The final part will conclude the results of the previous parts and discuss it with another author. The most important part will consist of partial conclusions outcome and finding.

The proposed extent of the thesis

60 -80 pages

Keywords

Georgia, Infrastructure, Developing, Developed, GDP

Recommended information sources

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Declaration

I declare that I have worked on my diploma thesis titled "Infrastructure Development in Georgia" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the diploma thesis, I declare that the thesis does not break copyrights of any their person.

In Prague, on 29th March

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Infrastructure Development in Georgia

Abstract

After the Soviet Union fall, Georgian economy and infrastructure have been collapsed, in 14 years economic crisis. Collapsed infrastructure created enormous problems for people. Analyses of infrastructural development from 2004 in Georgia showed economic boom and an increase of country's ruling effectiveness by government, which was gained by infrastructural development speed and privatization of public sector. Privatization was used to force the private sector to develop the country together with governmental structures. Infrastructural development includes inside large scale of rebuilding and modernization process, starting from railway roads, and ending with airports and international highways and city infrastructure. In this thesis it is compared and showed secondary data, using the method of simple linear regression to show how will grow, in future, the coverage of Georgian territory by natural gas, water pipe lines etc. It is also made a correlation analysis to show how GDP is related to the investments in infrastructure, and how foreign direct investments are important for the people who live in the country.

Keywords: Georgia, Infrastructure, GDP, FDI, Batumi, Tbilisi, Developed, Developing, Soviet Union, Revolution, Government, Soft Infrastructure

Rozvoj infrastruktury v Gruzii

Abstrakt

Po pádu Sovětského svazu gruzínská ekonomika a infrastruktura se zhroutily, za 14 let hospodářská krize a zhroucená infrastruktura způsobily lidem obrovské problémy. Analýzy rozvoje infrastruktury od roku 2004 v Gruzii ukázaly hospodářský rozmach a zvýšení vládní efektivity ze strany vlády, které bylo dosaženo rychlostí rozvoje infrastruktury a privatizací veřejného sektoru. Privatizace byla použita k tomu, aby soukromý sektor donutil rozvoj země spolu s vládními strukturami. Rozvoj infrastruktury zahrnuje rozsáhlý proces přestavby a modernizace, počínaje železničními trasami končícími letišti a mezinárodními dálnicemi a městskou infrastrukturou. Ve své bakalářské práci jsem srovnávala a ukazovala sekundární data, použitou metodu jednoduché lineární regrese, abych ukázala, jak poroste v budoucím pokrytí území Gruzie zemním plynem, vodovodním potrubím a podobně a také provedu korelační analýzu, která ukáže, jak se HDP vztahuje k investice do infrastruktury a to, jak jsou přímé zahraniční investice důležité pro lidi žijící v zemi.

Klíčová slova: Gruzie, infrastruktura, HDP, přímé zahraniční investice, Batumi, Tbilisi, rozvinuté, rozvojové, Sovětský svaz, revoluce, vláda, měkká infrastruktura

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List of abbreviations

EU	European Union
GDP	Gross Domestic Product
GEL	Georgian Lari (currency)
PSH	Public Services Hall

1 Introduction

In Georgia, and in general in developing countries, from the analysis of the economics and situation in society, we can see a low-level of education in the economic field and poverty. Therefore, in those countries it is easy to manipulate by citizens who have low level of education and are suffering lack of finances, medicaments and first needs to be alive. People without proper knowledge, without minimal income are always a problem for infrastructural projects, what can directly affect future of population of a country, and the speed of developing of country at all. Considering this, we could say that the only weapon against this lack of education is education, and one of the reasons for doing this diploma thesis is this.

In recent years, the infrastructure deficit has become the most glaring deficit that governments around the world must deal with. The gap between infrastructure needs and the resources what governments should spend is growing. Many developing countries across the globe, especially in South Asia, have congested roads, bridges in need of repair, poorly maintained transit systems and recreational facilities, deteriorated hospitals and schools, and waste treatment facilities; all in urgent need of rehabilitation and repair. Governments promise many new projects to close these gaps, but they often do not -or cannot- find the funding to follow through on their promises. These problems, in turn, impose large costs on society, from lower productivity to reduced competitiveness, as well as an increased number of road and industrial accident (Geethanjali Nataraj, 2007). According Geethanjali, this problems are existing in Indian and developing Asia, but we can generalize his idea for every developing countries, so, of this thesis is to show developing countries society how important infrastructure is, and how can it help to develop a country, improve the economic situation, and make resident's life more comfortable and easier.

In some cases, when the government tries to make some important infrastructural projects, it is the population who refuse spending money on these projects. A (good example is modernization of railway roads, when people think that railway cannot change their future and it is a waste of money. On the contrary, they request financing social projects, like pension reform. It is generally the case of poor and illiterate people who prefer short term reforms which satisfy their first necessities.

2 Objectives and Methodology

2.1 Objectives

Main aim of this thesis is to analyse the importance of developing infrastructure to GDP growth in the country and to analyse the relations between GDP grow and developing of infrastructure.

The Main aim will be fulfilled by partial aims:

1. Provide practical and theoretical knowledge for the people in developing countries about infrastructural development and infrastructure
2. Provide examples of the sustainable development of infrastructure
3. Analyse the infrastructure of the different countries
4. Give recommendations to the governments of developing countries in specific regions, for example Caucasus

2.2 Methodology

This thesis is divided into three parts. The first part is a theoretical one and is based on literature search. It defines the current state of knowledge in the field of infrastructure development with the overlap to its influence on economic growth and development.

In this part I used articles, books, researches and different electronic resources to provide information about relations between infrastructures, economics of country and development process of country, to show examples, explain and prove importance of infrastructure in country and in process of globalization. Some part of literature is explaining differences between soft and hard infrastructure, in some part of review is showed importance of water supply system, electricity, roads and railway, benefits of the highways and airports. Methodologically this part of the thesis is analysis of documents.

The second part relies on the theoretical part and it is the key component of the thesis. The author uses method of quantitative research such as statistical and mathematical methods.

In practical part I analysed situation in Georgia according to secondary data what I received from Georgian Statistical Office, World Bank and some another resources. I also used my previous experience from this country. Analysis of the times series are one of the important parts of the thesis. I used simple linear regression to forecast future growth or decrease in the some parts of infrastructure, correlation coefficient to analyse positive or

negative relations between GDP growth and some part of the infrastructure of the country, for example roads, railway, airports and finally I used trend line and equation to forecast future trend in 2 years perspective.

The final part concludes the results of the previous parts and discuss it with another author. The most important part consists of conclusions outcome and finding.

3 Literature Review

3.1 Political Fear and Definition of Infrastructure

In developing country, the most common reason of delaying or not success of a project, can be political fear. Politicians always want to stay as long as possible in power and running their country. Because of this sometimes they make incorrect decisions, scared of losing votes in elections, or not being elected again. This leads to their attempt to gain popularity by spending money for social reforms, and by decreasing money for infrastructural projects). It, what means that good support from educated society can help the government to rule properly by the country.

Politicians make an effort in order to satisfy their nation, but sometimes there are different points of view between the society and leaders, what can drive them to take unpopular decisions. Politicians, which are responsible of their residents, need to be literate leaders, able to take examples of how to increase the speed of development. According to article about role of education, access to education can improve the economic outcomes of citizens, and determine the prospects of future generations, especially in developing countries. However how authors of this article think, claim achieving of these goals is complicated. Politicians have too implemented various measures to increase access to education, and they trying to make more free and accessible education. However, results are mixed because of long term effect of education, which effects are not visible until 5 years after or more, and there is an unstable situation in the developing countries (The role of education in developing countries, 2019). But according to the experience of developed countries, we can say that education is a key in development of the country at all, and developing countries need to follow this trend.

An example of how important Infrastructure is roads, railways, airports etc. are, could be compared with the circulatory system of human being, where this infrastructures act like the veins which connect population from different regions, allowing the economy to reach everywhere.

Another example of importance of infrastructure and diversification is the unofficial embargo of the Indian government and earthquake in Nepal, or embargo of Russian Federation to Georgia in 2006. This can how important is to have a good and diversified infrastructure in all regions of the country and it's highlighting another question about infrastructural diversification. In 2015, Nepal border with China was closed due of

earthquake, and the only possible way of supply this country was from India, but at the same time with closed border with China, Indian government decided to make unofficial embargo to Nepal (due some political disagreement between this countries). Because of these actions and earthquake, whole economic in Nepal was paralyzed, and embargo touched all elements of life, from food and medicaments and to fuel for transportation (ground and aerial). In consequence of the lack of petrol, people were forced to use bicycles for movement Every oil and gas importation was provided by India. Nepalis government, after this experience, started diversification of infrastructure and economical activities, such as the upgrade of roads and custom infrastructure with China, and planning for improvements in order to get goods from China, and not only from India, so they could be more independent and safer.

As it has been shown, infrastructure have direct and indirect effect on economics of the country, and it should be one of the first issues to have in mind about in developing countries governments, so it can be improved the supply of basic needs of the nation (water, electricity, sewage system), inherently increase developing level of infrastructure at all (highways, railway roads, advanced power stations, telecommunication and etc.). After reforms and modernizing of all infrastructure of the country, all regions can become autonomous and decentralized from the main government; giving them some independence in relation to goods- regions will have their income. It is important to remember that in at the beginning of developing process, all regions of the country need strong governmental support, as it will be shown in following examples.

Infrastructure in the country is a key part of the economy, without which a country cannot exist. Infrastructures are used in regular life and by businesses. In most cases, slow growth of advanced business in the country and slow increase of GDP is caused by an undeveloped system of Infrastructure. Economists around the world make observations of about how the increase of spending in infrastructure as was the answer on-going economic crisis from 2008, what means that crisis sometimes can be good driver for changes and moves in economics (Jimene, 2011). In this kind of situations, when there is bad infrastructure, problems are easy to solve by advanced infrastructure policy, but because of bad educated and poor population, prefer immediate results immediately , government doubt about starting the improvement of the infrastructural system, and usually it is decided to spend money on social programs that satisfy population in a short-term period more than in a long-term period.

Before going deep in the topic, it is empathised the different types of infrastructures. First of all, we need to understood infrastructure as the material public capital (roads,

railways, airports, pipelines etc.); and superstructure as immaterial public capital (knowledge networks, communication, education, culture etc.) (Buhr, 2003)

1. **Critical Infrastructure** is determined by the government of a country, and mostly includes strategic objects like shelters, food storage, health care, gas and oil storages, heating system. Critical infrastructure is important for the country in dangerous situations, as could be a natural disaster or some conflict or even war, and they are not used in normal life. Critical infrastructure is mainly present in developed countries, since it is costly and needs some stages of development before getting it. (Some countries, like former soviet members, can have this infrastructure because of another type development process, but they usually had conditions, with not enough care or knowledge)

2. **Hard Infrastructure** – It is the most important part of the infrastructure f-now that it helps modern society with development and growth, helping in globalization and modernization process, and making life more comfortable and easier. Without hard infrastructure modern country or city cannot exist at all. It includes inside tangible infrastructure, roads, airports, railway, highways, sewage system, bridges, tunnels (Buhr, 2003) etc. all this infrastructure is used in usually life, A. This part of infrastructure first one developing country should improve, or even develop from zero, development of hard infrastructure and it is an important indicator that country's economy is being transforming into a high stage of development and growth.

3. **Soft Infrastructure** - This type of infrastructure supports economics in the country, and they are, for examples, education system, law enforcement system, government system, institutions, etc. Soft infrastructure is institutions for support economics, individuals and population at all. Differently from hard infrastructure, they are not tangible, and include the mostly human capital. (What is Infrastructure, 2018)

In real life, every type of infrastructure is important for a country. Soft type of infrastructure was started developing thousand year ago, from little tribes and first kingdoms until our days, with country's government what's includes inside local government and city governor. Nowadays, Infrastructure in countries need more advanced way of developing, what should involve every regions and countries, and they should connect countries between together and make more global and open society (Dodson, 2017).

Slightly later, by the time cities develop and settlements needs of society increase population and urbanization need of people in road, garbage collecting, sewage system become obvious, cities start becoming more advanced, more developed with suburbs, city centre, central parks, etc. Finally, civilization went to the industrialization era, with new

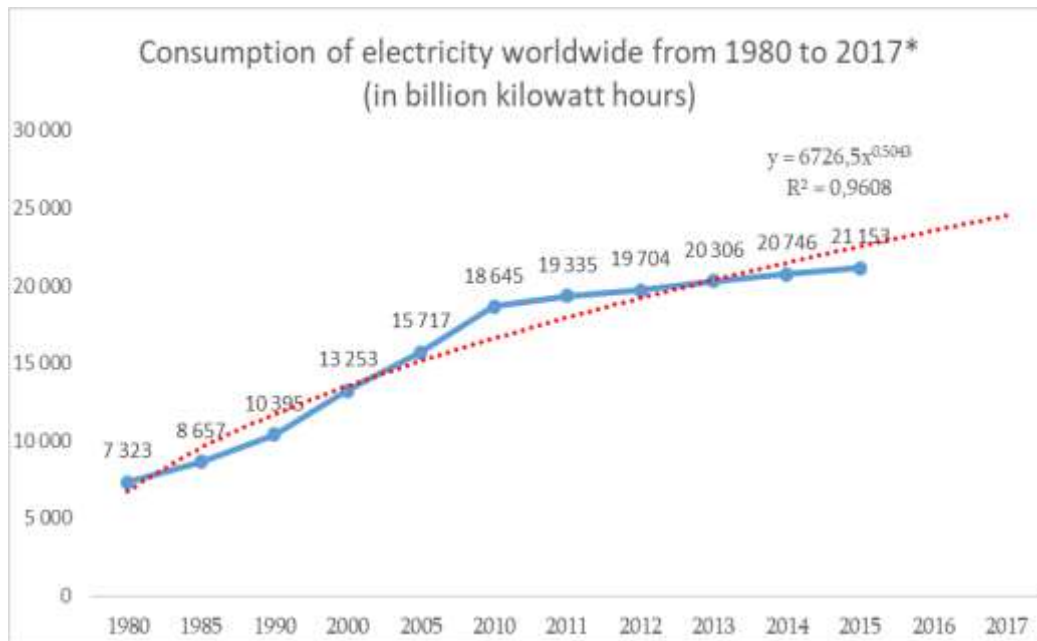
technologies, new needs and doubled speed of technological development. Cars, trains, subways, electricity, garbage collecting system, central heating and water system were invented, as like asphalt and railway roads as well as airplanes and airports for them (Spacey, 2017). Basically, all needs of human in the world, stuff, but not all cities and countries become developed as need to be.

3.1.1 Industrialization and New Era

After industrialization, from beginning of Twenty Century until nowadays, we went in to the globalization era with the internet, highways, low-coast airplane companies, high-speed trains and open borders; essentially everything what is helping to ~~use~~ be more global, more educated and more socialized than in the past. From this part we can understand how infrastructure become part of the usual life of humans. In 21st century, human became more advanced. Technological progress helped to archive environmental objectives, such as increased resource and energy-efficiency. Without technological development we wouldn't have industrialization, without industrialization we wouldn't have development (United Nations, 2019). However, in the world we still have undeveloped (because of no industrialization) countries and regions, where the transportation system and electricity ~~is~~ are luxury things, finding clear drinking water is hard there isn't garbage collecting system and where sewage is not collected or, in case it is, dirty water goes directly inside of rivers or sea without cleaning (How Sewage Pollution Ends Up in Rivers, 2018).

For better understanding subject matter and relate hard infrastructure to the increase demand from population there are shown show you some examples of that infrastructure, one of them is electricity and related system, with number of population and technological growth, quantity of kilowatt energy what we are using per hour is growing by the year, on a **Chart 1** statistical data from the World Bank can show to us how consumption of electricity and demand of this hard infrastructure was increased from 1970 to 2010.

Chart 1 Consumption of electricity in the World, Thousand Kilowatts (1980-2020*)

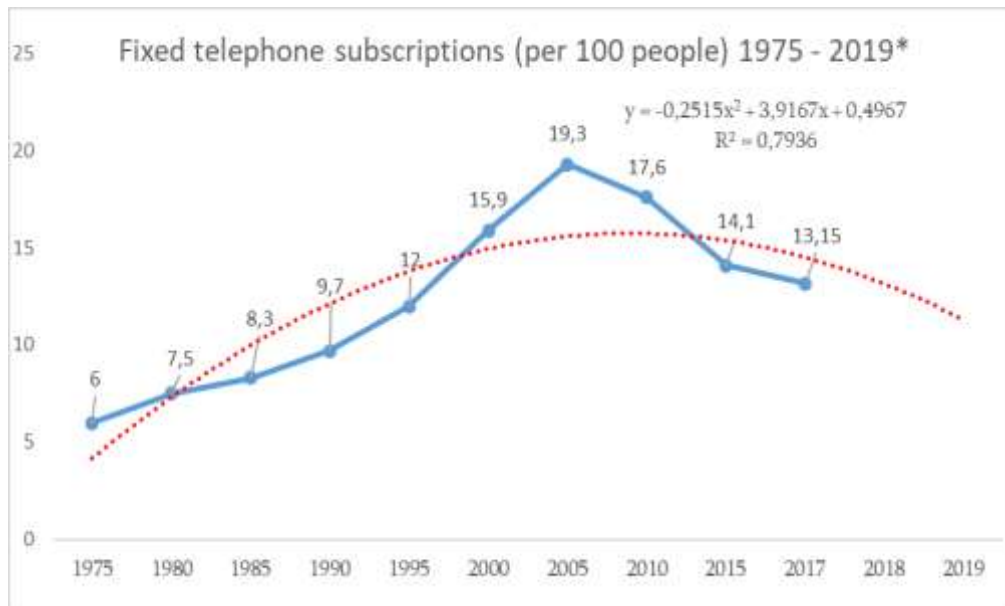


Note: data after 2015 is not available. Source: own work according data from statista.com

Although in this case demand on hard infrastructure is increasing by the year, the demand on fixed phone lines trend to decrease. The reason of this is the technological progress (mobile phones and the internet), but still 16% of the population of the world has no access to mobile networks (Sustainable development, 2019).

In case of fixed telephone lines there is different image. As we can see on **Chart 2**, from 2005 demand on this kind of telephone connection started decreasing (inventing smartphones). From this Charts we can see how they both are hard type of infrastructure, but one is increasing and other one is decreasing. By the time demand on electricity will increase and developing countries will need to follow this demand. From another point of view, if they don't follow this trend it will mean that they will stock in past, their GDP will not increase in future, and they will be under development. In addition, according **Chart 2**, little change in fixed telephone lines can show that development in some country doesn't go fast, and people are still using old technologies, etc., reason why this kind of charts are usefully.

Chart 2 Fixed telephone subscriptions per 100 people (1975-2020*)



Source: own calculation according data from World Bank

In 2018 there are still places where people don't understand that before building a country, and being rich and satisfied with life, before it is necessary to think about something big, it is needed to have basic resources, like water, electricity and roads. Society needs support or push government to develop faster; if country doesn't have fundamentals, it will never grow, and it will be always suburbs with poor people, without any possibility of growing. Country needs to go in industrialization and get development, for example industrialization have multiplier effect which have positive impact on society. Every manufacturing job creates 2.2 jobs in other sectors (9 Industries, Innovations and Infrastructure, 2019).

Georgia is a post-soviet country in Caucasus region (Europe), where 14 years ago the city of Batumi was one of the worst places in the region, but by correcting infrastructural policy of government, it started growing and finally it became the second largest and developed city in the country and in Caucasus region. It is now one of the most popular destination for summer holidays on local and regional level. In the process of developing (Georgia is still a developing country), society had problems with the government because of low-level of education and poverty. Residents usually were against big infrastructural projects, and the government needed to do some projects by force, but explanation didn't help in some cases. In this fast-developing period in Georgia poor people usually said, "so what? we will eat asphalt?" They were popular words as reply to "Asphaltization" of the country and developing transportation system in cities and rural places...

In real economics of developed countries, investment in infrastructure has a real impact on creating and sustaining jobs. Research made in USA showed that every US\$1 billion in Federal highway and transit investment funding supports 13,000 jobs for one year. Analysis of annual data from the U.S. Bureau of Economic Analysis (2012) , as well as from the U.S. Bureau of Labour Statistics (BLS), suggest that “68 percent of the jobs created by investing in infrastructure are in the construction sector, 10 percent in the manufacturing sector, and 6 percent in retail trade” (Role of Critical Infrastructure in National Prosperity, 2015). According this we can understand why infrastructure it’s needed for stable development and satisfaction of needs of population.

3.1.2 Short-Term and Long-Term Effect

Usually differences between short-term and long-term reforms are effect on economics of the country and the future of population and households. In short-term reform, effect can be seen directly, in less than one year, and in long-term reforms it is needed minimum 5 years to see result. The most popular short-term reforms are social reforms, like pension system and agricultural support of the farmers. Money spent in this kind of projects cannot increase GDP or wealth of people, and they are heavy burden for budget, what people usually cannot understand.

Some of the policies support long-term growth in ordinary life and in crisis period, for example introducing infrastructure projects that can be brought onstream quickly or improve the quality of existing facilities, particularly in education. Boosting spending on labour force training increasing strength of the market, cutting taxes for labour force will help boost consumption and improve long-term job prospects. Government should help to business with development by decreasing obstacles for new companies, supporting them to enter the market, so it’s will boost demand. The long-term strong competition will help raise productivity and living standards and it will help population to develop and increase of living standards. (Governments must maintain reforms for long-term growth during crisis, 2009).

Unlike short-term projects where government needs to spend money every year, for long-term infrastructural projects the government needs to spend money once, and after it can get the result for a long time in future and generate more income for another stage of development. This type of projects is effective for economic and for society, and reforms include inside some short-term effects on population and on economics, like employment, money movement, development of nearby areas and increase on demand of some type of products for local market and manufacture.

In the next chapters, we will go deeper inside of topic and we will understand more about role of infrastructure in the country's life. Long-term strategic planning is the solution for the future of the country, and one important part of strategic planning is an infrastructure what will support future growth of GDP etc.

3.2 Infrastructure in Developing Countries

The role of infrastructure in economics is huge, but not lower than the role that it has in the case of connection between countries, regions, and continents. For future development of global society, all countries need to be connected and linked together. For this reason, one of the most important part in infrastructure is highways and railways. Local roads and international highways help markets to be connected between together, making available communication between cities, regions and countries. In most cases, one of the best ways to increase income level in rural areas is to develop new roads and public transportation system between these areas and cities, what will naturally help population to move through those markets and make more income, easier life and more comfort for living, and the possibility to develop in future and being connected to the world.

From not far past, in Asia, correct policy of infrastructural development helped to decrease the poverty level and increase the income of households (Infrastructure for Supporting Inclusive Growth and Poverty Reduction in Asia, 2012). One of the most important parts of this developing process was transportation system development, to make more accessible markets though different regions. For example, in Asia, where at the beginning of 2 000-year GDP per capita was 2 490 dollars, after high-speed development of transportation system this number was increased two times and became 5 489 dollars. Also, from 2005 to 2008, the number of people how lived with income under 1.25 dollars per day decreased from 903.4 million to 754 million. The process of developing infrastructure provided additional job places and economic activities, reducing production cost, and providing a better connection between markets, etc. (Infrastructure for supporting inclusive growth and poverty reduction in Asia, 2012).

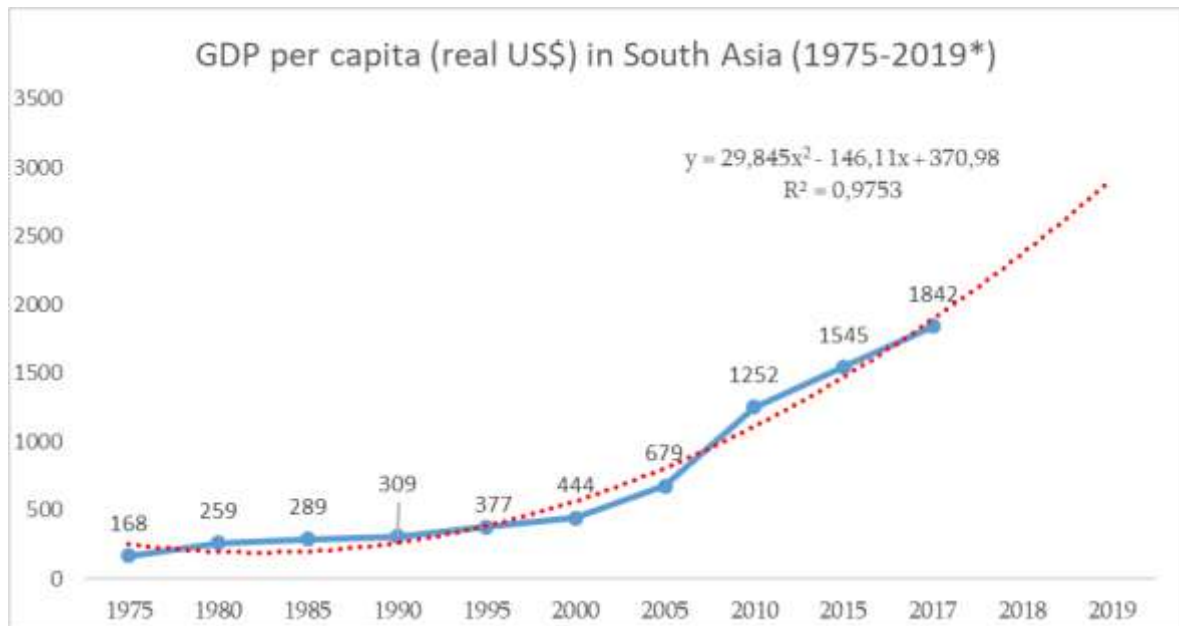
But situation in Asia is still terrible, a specially in South Asia (**Chart 3**), where there are some poorest countries of the world, as Afghanistan, India, Pakistan, Bangladesh, Sri Lanka, Nepal, Bhutan and Maldives. In these countries, as **Chart 3** shows, GDP per capita grows very slowly; analysis of situation in these countries explains the slow development speed of hard infrastructure and low level of development of soft infrastructure, as well as

high level of corruption, undeveloped institutions, etc. No fresh water, sewage system, public transportation and proper roads, support from government for people and no business, make these countries the poorest in the world.

The gap in South Asian infrastructure is very high, with differences between goals of development and real infrastructure. According to the report above mentioned, it will require investment of a \$2.5 trillion over the next ten years: one third to be spent on transport, one third on electricity, and the remainder on water supply and sanitation, solid waste management, telecommunications, and irrigation (Crouch, 2014). In 1960, GDP per capita in South Asia was 81 USD, and in 2017 it became 1840 USD, but for this growth it was necessary 57 years. Nowadays South Asia has become one of the fastest growing regions in the world, with growth rate of around 7% in last few years. The region, which accounts for around one quarter of the world's population and around 40% of world's poverty, needs to boost and develop infrastructure in stable way to archive suitable development goal and give better life to the people and population of Asian countries (Nataraj, 2007).

Deficit of infrastructure in Asia is enormous, but development of infrastructure and help from government to private companies will help to decrease gap in infrastructure of developing Asia, what will affect population in good way in future (Dappe, 2014).

Chart 3 GDP per capita (real US\$) in South Asia (1960-2019*)



Source: own calculation according data from World Bank

3.2.1 Situation in Land Locked Countries

If countries with sea have problems about infrastructure and economic growth, for landlocked countries problem are even bigger (case of South Asia). They are totally dependent on road and air communication to have connection to the global market and world, but problem in these developing countries is that they cannot develop roads and air communication fast enough. Nine of the twelve countries with the lowest Human Development Indices (HDI) are landlocked countries (Challenges Facing Landlocked Developing Countries, 2004); in simple words, landlocked countries do not have direct access to the sea, so the sea is only reachable via the territory of other states (Peter Warr, 2019).

Most of the landlocked countries are situated in Asia and Africa, and most of them are developing countries. Landlocked developing countries have higher transportation cargo costs compared to coastal developing countries, for example, in Asia the ratio is 3:1 (United Nations Conference on Trade and Development, 2010). To give understanding, landlocked countries in Asia and Africa are poorest countries in the world because of bad infrastructural development (both soft and hard infrastructures) and because of bad relationships with neighbours.

For landlocked countries, the best way to help nation to reduce poverty is developing advanced air transportation system, good road and railway connection between all neighbours. As it was mentioned before, after earthquake in landlocked Nepal, transportation system was

collapsed and the only way to get aid from another countries was air transportation. However, because of bad relationships with India, Indian government decided to make unofficial embargo for Nepal, and this country fell in critical situation since it didn't have fuel storage system and its infrastructure connecting to China was bad developed. After that, Nepal had critical situation with medicaments, food and another necessary resources to live; Nepalis airports were not able to receive help from abroad when necessary- reason why Nepal needed critical infrastructure improvement.

To be a landlocked country can mean that could have problems with trade policy; it is hard to be independent for these landlocked countries, especially if there is presence of big neighbour. Coming back to the example of Nepal, it shares a long land border with India, which is the way to contact to the sea, reason why it can be said that Nepal is 'India-locked'. Nepal's GDP is about 1% of India's. India has, until recently, pursued to Nepal a high restrictive trade policy with respect to the rest of the world. However, smuggling across the Nepal-India border is very easy, so if Nepal tries to set tariffs with respect to the rest of the world above India's, goods are simply smuggled in from India. If Nepal tries to set tariffs below India's, goods are simply smuggled from the rest of the world to India, using Nepal as a conduit (e.g. intermediate goods). Nepal has been compelled to adopt a similar trade policy to India's, but even though its comparative advantage is quite different (Trade Policy in Landlocked Countries, 2019).

Economist Paul Collier said once in his book "The Bottom Billion" that "If you are coastal, you serve the world; if you are landlocked, you serve your neighbours", this words simply describes situation of landlocked countries, and for example situation in Nepal, in some cases, when countries have good relationship, they can make some agreement about exchange of lands or they can get even for free some part of land to have port and access to the water. Another example is Ukraine and Moldova, which in 2005 did a territorial exchange. With this exchange Moldova received a 600 m-long bank of the Danube River, which is an international waterway, and subsequently it was built the Port of Giurgiulești there (International Waterway Governance, 2018). Nevertheless, this kind of exchanges happen rarely, countries usually have high competition and they block their neighbours from access to the sea or ocean to don't give advantage.

Critical infrastructure in landlocked country is very important due high tensions between neighbours. In developed country, government should use critical infrastructure to help economic and people to not drown and stay alive before international aid comes to help; before roads, communication with other countries should be restored. Part of this kind of

infrastructure are gas and oil reservoirs, provision storage and emergency shelters, what are not existing in Nepal and in most of the developing countries. Of course, this type infrastructure is costly and needs good management system and well educated people, and although it is not easy to build and maintain critical structure, it is better to spend money instead of being affected by some crisis in long-term period, and then be dependent on the neighbours, who sometimes are not much friendly because of competitiveness. This example shows the importance of having good air connection with another country, diversified connection to neighbours and critical infrastructure for landlocked countries and at all, for all countries, because of world around us can be sometimes instable and unfriendly.

3.2.2 Waste and Water Management and Quality of Life

According to another observations, big problem in developing countries is waste and water management system and sanitation, what have direct effect on health and happiness of people. Satisfied population is more productive, now that they are in direct connection with economics and vice versa, what generates an economic cycle. For example, water effluents are major contributors to a variety of water pollution problems.

Most cities of developing countries generate on the average 30–70 mm³ of wastewater per person per year. Wastewater goes directly to the land or to the rivers and sea without proper cleaning and treatment, polluting living area of humans and animals, affecting humans health because of the pollution, and in consequence, affecting economics in long-term period (Impact of Wastewater on Surface Water Quality in Developing Countries: A Case Study of South Africa, 2016) According to the World Bank, water pollution is a common problem in developing Asia and Africa, as happens in countries such as India, conferring to the World Health Organization research (Helmer, Hespanhol, 1997).

In 1992 year, out of India's 3,119 towns and cities, just 209 had partial sewage treatment facilities, and only 8 had full wastewater treatment facilities; in another words, dirty sewage water was going to rivers directly without cleaning, which was after used by households for usually life, what is disaster for health and big pressure on medical services because it increases costs.

Wastewater effluent should be treated efficiently to avert to the users of the aquatic systems about adverse health risk. The release of raw and improperly treated wastewater onto water courses has both short- and long-term effects on the environment and human health (Impact of Wastewater on Surface Water Quality in Developing Countries: A Case Study of South Africa, 2016)

By the time Indian government started fighting with this problem, but for huge countries like India it's costly and big deal to make for all country well working sewage system. However, as it was mentioned above, not only India have problem with water and waste management, but also Post-Soviet and small countries like Georgia, Azerbaijan, Armenia, etc. still have these problems, in addition to problems with roads, railway and air transportation. For example, around 900,000 tons of waste is generated annually in Georgia, and more than 75% of it is estimated to end up in landfill sites. Landfill disposal is the least desirable way of handling waste, and it is even less desirable if the landfill is poorly managed and maintained.

In the case of Georgia, it is a significant issue in contrast to European countries, such as Sweden, where only 1% of waste ends up in landfill (How Georgia is changing its approach to waste disposal with EU support, 2018). In Soviet Union only existed collection of sewage waters without cleaning (because of low standards), but after falling the Union, this system became destroyed, not functional or just old and with need of modernization. And it was the same with the waste management and roads, just open landfills without separating trash and without proper management, damaged roads without maintain, etc.

But comparing to the neighbours and another Post Soviet countries, Georgia's infrastructure development process is going well, better than in the other ones. By 2023, Georgian government plans to close all the existing dumpsites and create just 10 new sanitary landfills across the country. (How Georgia is changing its approach to waste disposal with EU support, 2018).

According to the Georgian Ministry of Infrastructure, in 2013 and 2014, for the construction of highways was spent 289,523 million USD; in 2015 was spent 165,476 million USD and process still going; until 2020 planned to open new sections of international highway, what allows connection between Asia and Europe. According to other statistics from Georgian Ministry of Infrastructure (GMI), up to 60% of cargo flow in Georgia is transit. Logistics accounted for around 9.5% of GDP in 2015 and about 3,3% of employment. Process of developing in Georgia includes inside modernization of sewage system, trash relying system developing, advanced infrastructural policies, strategic planning, etc. Some projects are in the process of developing till this moment, but realization of some of them will start soon in 2019.

In 2019, Georgia will start reclining trash, in 2018-2019 it will be prohibited selling not-degradable plastic bags. In some cities, by support from German Development Bank, was

totally changed water and sewage system, and in most regions was developed gas pipelines to all houses and commercial objects.

Before 2010 dirty unprocessed sewage water from city Batumi was pushed away in the Black Sea, but from 2010, sewage water is processed, cleaned and then lead to deep sea. Because of some reasons, the importance of this projects is hard to understand by some people, but experts in economics can recognize the process of advanced development, what means that if country starting cleaning water from sewage, this country is near to left low level of developing process and went to next higher stage of development. About Georgia we will have a lot of examples starting from developing cities, ending with rural areas and connection between world by airports, railway, and pipelines.

For a better understand, we will go deeper in economic effect of infrastructural development in Georgia,

3.3 Infrastructure - the Synonym of Development

Infrastructure is synonymous of economic development. Roads, railways, and utility system are needed in every economy, and the lack of infrastructure services is a big barrier to growth and forcing country to be undeveloped. (Jones, 2006). If in Georgia everything is going well, lack of infrastructural development became one of the hardest problems for Armenia in developing process after Soviet Union fall. Problems with infrastructure can sometimes be detected or not, depending on the type of infrastructure (soft or hard infrastructure). If in Georgia corruption is practically not existing anymore, and country institutions working well, in Armenia corruption is still harming process and still preventing future developing of country. Considering Armenia as a landlocked country, who has problems with 3 neighbours (Azerbaijan, Turkey, Iran), the situation is very hard. The only way of communication with the world this country is though Georgia and air transportation, but because of corruption in its government and destroyed infrastructure after Soviet Union, Armenia is stocked in 90's, and it still cannot left this circle; they still don't use potential of air, railway and road communication to be part of global society and get benefits from this. An infrastructure deficit doesn't allow economics grow and generates barriers for growth for many developing countries (ADB, 2008).

As it is described before, hard infrastructure it's important for a country, and it is very easy to identify from outside, but also soft infrastructure has an important role in economics. With proper hard and soft infrastructures. and proper policy with institutional support, it is

doubled the developing speed of the country. When government is not corrupt, with educated state workers, everything is going well without problems. For example, in process of developing hard infrastructure, government tries to develop some another, related services and infrastructure for the people, because it is the way how people live, with one process starting another, etc. Improvements in transportation and communication help markets with connection and money to be more liquid, what means more investment and growth of economics and telecommunication infrastructure, which also provide tools and information necessary for markets to work better (Jones, 2006).

Another example is how in the developing process of Georgia it was invented innovative Public Service Hall (PSH), what was one of the most important and top products from Georgia, not only at local level but also for global society. In 2011, The Ministry of Justice decided to create it in order to bring the various one-stop services from government together in a single location, making it easier for citizens to carry out their administrative tasks. The National Agency of Public Registry and the Civil Registry Agency served as models for the entire country. Other agencies joined them: The National Archives, the National Bureau of Enforcement and the Notary Chamber of Georgia. At Public Service Halls, up to 400 different administrative tasks can be carried out, including getting a driving license, obtaining civil status documents, signing powers of attorney, registering companies, managing alimony payments, etc. (Public Service Halls, placing innovation at the service of citizens, 2018). PSH in Georgia eliminated bureaucracy procedures, corruption and helped to business with development by attracting foreign investment and helping citizens with business procedures.

Nowadays (2018-2019), the PSHs (which numbered 19 as of January 2018) provide “front office” services, helping meet citizens' needs as closely as possible, while government agencies fulfil the “back office” tasks. Applying a “customer service” approach. They provide services in very modern, comfortable and welcoming buildings. In a single day, around 10,000 “transactions” are conducted for 23,000 users. The average waiting time is 3-4 minutes, and each “transaction” or service operation takes 7 minutes on average (Public Service Halls, placing innovation at the service of citizens, 2018). Thanks to the success of the PSHs, Georgia has become a benchmark for many countries: 21 since 2011, over 700 delegations from 50 countries have come to study the Georgian experience. India, in particular, has shown great interest in Georgia's PSH model (Why India should adopt a Georgia like Public Service Hall model to boost its smart city initiative, 2017).

According to international statements and researches in Georgia making business is very easy; and it's one of the reasons why in Georgia infrastructure is developing, because of growing business and strong private sector, private sector is good for hard infrastructure.

Private sector sometimes helps state government with developing roads, parks, stadiums, and another kind of infrastructures, attracting new investments. Talking about very infrastructure and economics, we will understand that infrastructure is related to economics and at the same time economics is related to the business, and those mix makes one big circle where all parts of economics are important, supporting each part of economics, so they automatically help to another part of economics with improvement, and it's no ending cycle of growing and developing process for the country and for the economics as well.

To understand the infrastructure in developed countries, we should go a little bit deeper in topic. For this, the term of developed countries is used to designate nations that enjoy high per capita income, high standards of living, long life expectancy, and other measurements relating to a high quality of life for the individual. They are also called "first world countries" or countries with advanced economics and high human development index (Gale, 2008).

Life standards and quality of life have a direct effect on the future development of life of thousands of people. Happy and satisfied people have a key role in economics- economics cannot grow without happiness, satisfaction and proper education. It is why developed countries are trying to make more open and more liberal society, and they try to support population with education, governmental services, policies, freedom and help them with comfortable life. But before they become developed countries, they were developing countries as well as nowadays countries from 3rd world. The history of those countries is useful and interesting to analyse- 1) what they did; 2) how people lived before and how they live now; 3) what they think about future; and 4) are they satisfied by life standards now? Fortunately for Europeans, most of the developed countries are in Europe, and the main indicators are their infrastructure in the cities and of rural area, city landscape planning, green areas and relying of the trash. The most tangible and visible indicator of development in a country or in cities is public transportation system, so it is one of the first in being analysed in the country, when boarder is crossed. Because of that, in European Union countries basic infrastructure is developed and there is no need any more in fast development of infrastructure.

In European Union, after a period of sustained growth and investment in infrastructure, the investments of money started to decline sharply from 2009 onwards. Most decrease was showed in public infrastructure spending. In period of high development of infrastructure, amount of spending was also dropped in case of private infrastructure

(Investment in infrastructure in the EU Gaps, challenges, and opportunities, 2016) reason why this was stratification of basic needs and increased need of advanced infrastructure, but development of advanced infrastructure its more slowly usually and takes longer time.

To make difference between developed and developing country we can use public transport system as example. This is the case how developed country always have well working public transport system oriented on green energy and on less emission of CO₂-environmental policies are indicator that country going well in development. One of the reasons why public transport is well developed in European countries (developed countries) is explained by EU transport policy. According to this policy, transport should make one single market inside and outside of country and should help people to make communication between together. Like this, transport is a key element for EU to make one family, promoting jobs and economic growth. Before EU was formed, most important agreement was signed in the Treaty of Rome in 1957, agreement included inside: “the free movement of individuals, services and goods” (Transport in the European Union, 2018).

But public transport, and transportation system is not just comfort or connection between people for the county’s economy, it is the main pillar of the economy of the country. According to a document published by EU, transport is a fundamental sector for and of the economy. It embraces a complex network of around 1.2 million private and public companies in the EU, employing around 10.5 million people and providing goods and services to citizens and businesses in the EU and its trading partners. Transport also provides connection between EU market and mobility of work force, goods, money and investments (Mobility and Transportation, 2018). Not just public transport but also traffic in those countries are nicely regulated and asphalt of the road are in good conditions, buildings are built without damaging nature (energy effective), with well-planned infrastructure (parking areas, green spaces, schools etc.).

By the time with development of the city, city face and priorities are changing. At the beginning, development new cities can be without any planification, but they usually change, becoming more planned and environment friendly. But another thing to think about is how those developed countries did their patch 40-50 years ago, when gap between developed and developing countries was, and still is, huge. However, countries that still are under developing process, they have great examples for development and way what they can follow easily without inventing new wheel; they have possibility to don’t do mistakes made by another countries before, such as destroying wild habituating area of animals, green spaces and water areas, taking space from nature and giving to the commercial activities.

Supposing that money is liquid and people moving without barriers, everybody is satisfied and the only thing that government needs to do is just maintain infrastructure and care about its population, so it is easier to make life better in countries with low level of development. However, as examples showing, developed countries after developing process try to help developing countries by advices and by grants; e.g. in developed countries it can be found organizations that provide grants for developing countries, organizations like USAID, Development Bank of Europe, Development Bank of Germany, Asia Development bank etc.

For example, in Case of Afghanistan, USAID helped them with newly commercialized national electric company in Kabul, what has reduced electricity loss, due to poor billing, illegal connections or inefficiencies; from 35-60% improvement in long-term sustainability and reliability of the system for its customers. Also, on the island of Mindanao, in the Philippines, a USAID-supported program has provided electricity to more than 13,000 households in 474 remote rural villages using solar photovoltaic cell and micro-hydropower systems (Improving infrastructure fosters stability and accelerates economic growth, 2017).

3.4 Example of the Czech economics transformation from planned to market driven economy

For better understanding, example of the developing process of the Czech Republic after Soviet Union fall can be a good illustration to show how country had developing process, and how he can transform from one economy system to another, how country can transform from developing to developed and have strong economy.

If at the beginning of 90's Czech Republic, GDP was 40 Billion; in 2017 Czech Republic GDP grew into 215 Billion; and to figure out, it is big growth and jumps from 40 Billion to 215 Billion- some countries cannot do even 1 Billion growths per year, when the Czech Republic did annual growth 20 Billion in 2016-017. In this successful story government had biggest role to compare another post-soviet countries. Government incentives dating back to the 1990s, which included tax reduction to boost investment in country and attracting investors, boosted twice more further after the country joined the EU in 2004 (Why does the Czech Republic have the lowest unemployment in the EU, 2017), but also one of the important thing in success of the Czech Republic to compare another European countries is factory jobs, no small feat these days. The central European country's manufacturing industry accounts the largest proportion of its economy compared with others in the EU and represents more than a third of all employment. Very important pillar for Czech economics nowadays

are car production- cars are produced by famous companies like Skoda, Toyota and so on. (Nelson, 2017). However, what was the key point to success for the Czech Republic? In reformation and transformation period first, what country did beside another Post-Soviet countries was privatization of all lands and state property, creation of free industrial zones and using former army air bases to create free industrial zones, making easy to do business, attract investors, etc. For example, company Skoda, after privatization from government, increased productivity from 200 000 cars per year until 2 million cars annually, according to David Marek, chief economist at Deloitte in Prague.

The nation's unemployment rate is low for two main reasons. First, in Czech Republic developing plants and factories was cheap and work force was qualified but comparing to other countries it was also cheap. Second, the Czech business cycle is closely connected to the economic health of the EU. When Europe is doing well, the Czech Republic does even better because of the reason what was mentioned before (Nelson, 2017). Privatization process importance was that government made free industrial areas at former army bases, airfields to attract high technology companies, in this case another post-soviet country did mistakes, low management and knowledge delayed development of this countries for 10 and more years.

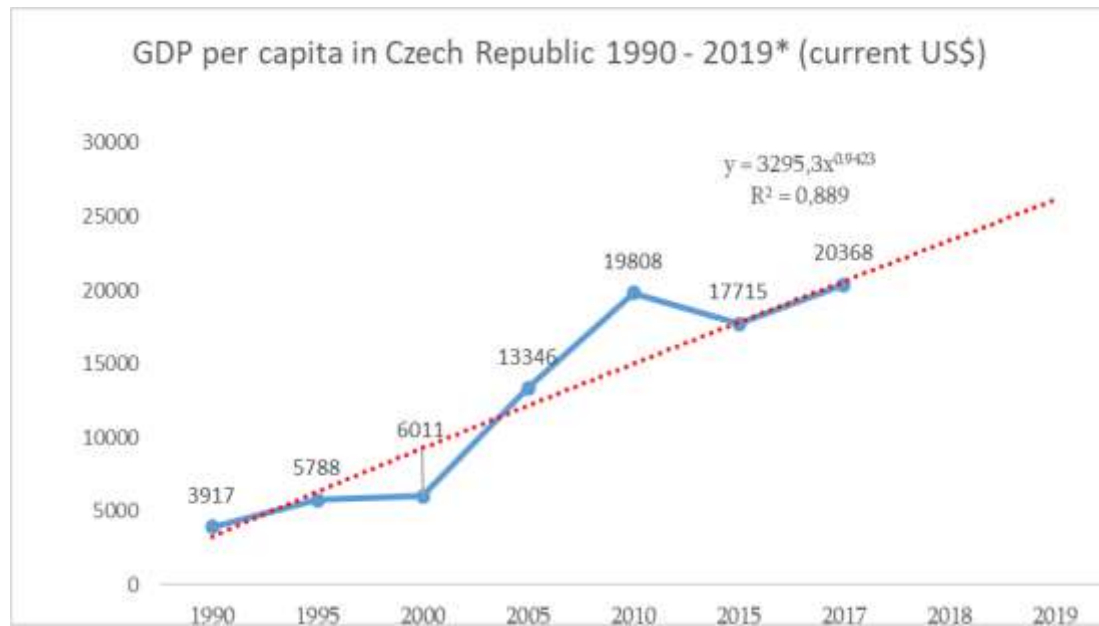
High technology companies can invest big amount of money in country and can help with developing high technologies that can generate more incomes, plus high technological field of business, that can help with education of society what have indirect effect on economics in long term perspective. In the beginning of 2000, in the Czech Republic another part of the reformation was liberalization of country and changing (not usefully) laws to new more friendly law for the business, to make life of people and as well business easier. An example is a part of the transformation plan that was development of state organization- CzechInvest. CzechInvest is a public agency that supervises a large part of the industrial policies in the Czech Republic. It is active in foreign direct investments (FDI) attraction and enterprise development, and provides the following services to investors:

1. Help with information on investment opportunities;
2. Investment incentives and subsidies;
3. Interface between investors and the Czech public administration;
4. Supply chain clustering, zone development and supplier development;
5. Small and medium enterprises (SME) development;
6. Access to European Union funds; (Benacek, 2010)

As researches shows, bureaucracy can decrease speed of development of the country two times and more, reason why people lose willingness to do business. Bureaucracy is like

the proverbial elephant in the living room, could not be positively acknowledged, nor could it be magically spirited away. Bureaucracy is a problem for economics, because makes barriers for business, and country with bureaucracy always seems like good place for corruption (Crouch, 2008). Usually in developed countries bureaucracy existing on minimum level and governmental services are on high level.

Chart 4 GDP of the Czech Republic (real Billion USD, 1990 – 2019*)



Source: own work according data from World Bank

Main driver and pillar of economics is a business so, economy needs business to be a developed, and business needs infrastructure. Because of that, developing countries should follow way of developed countries, with decreased bureaucracy and increased help from governmental agency. In the period 1998–2007, CzechInvest provided direct financial support to 776 projects, investing US\$ 20 billion (34 percent of all FDI to the Czech Republic in that period), which created 153,000 new jobs (10 percent of jobs in Czech manufacturing). The cost of the public finance channelled via CzechInvest was US\$ 5 billion (including pending tax breaks). Support provided by CzechInvest attracted 31% of investments in core are of economics, in projects what was smaller the contribution was usually 50 percent. Large projects could end up with an incentive of about 15 percent. All of these were subject to EU ceilings on public support (Benacek, 2010). To show tremendous growth of Czech economy, in **Chart 4** it can be observed GDP growth statistics form 1990 until 2017.

Czech Republic, when in process of development, unemployment level decreased from historical maximum 8.8 % in 2000 until historical minimum 2.9 % in 2017, in same period with growing GDP and decreasing of unemployment level.

Chart 5 shows how the average wage grows up from 3 286 CZK per month in 1990 till 26 467 CZK in 2015, wage is one of the important indicators of growing economies.

Chart 5 Average gross wage in the Czech Republic (1990–2020*) CZK per month



Source: own work according data from Czech Statistical Office

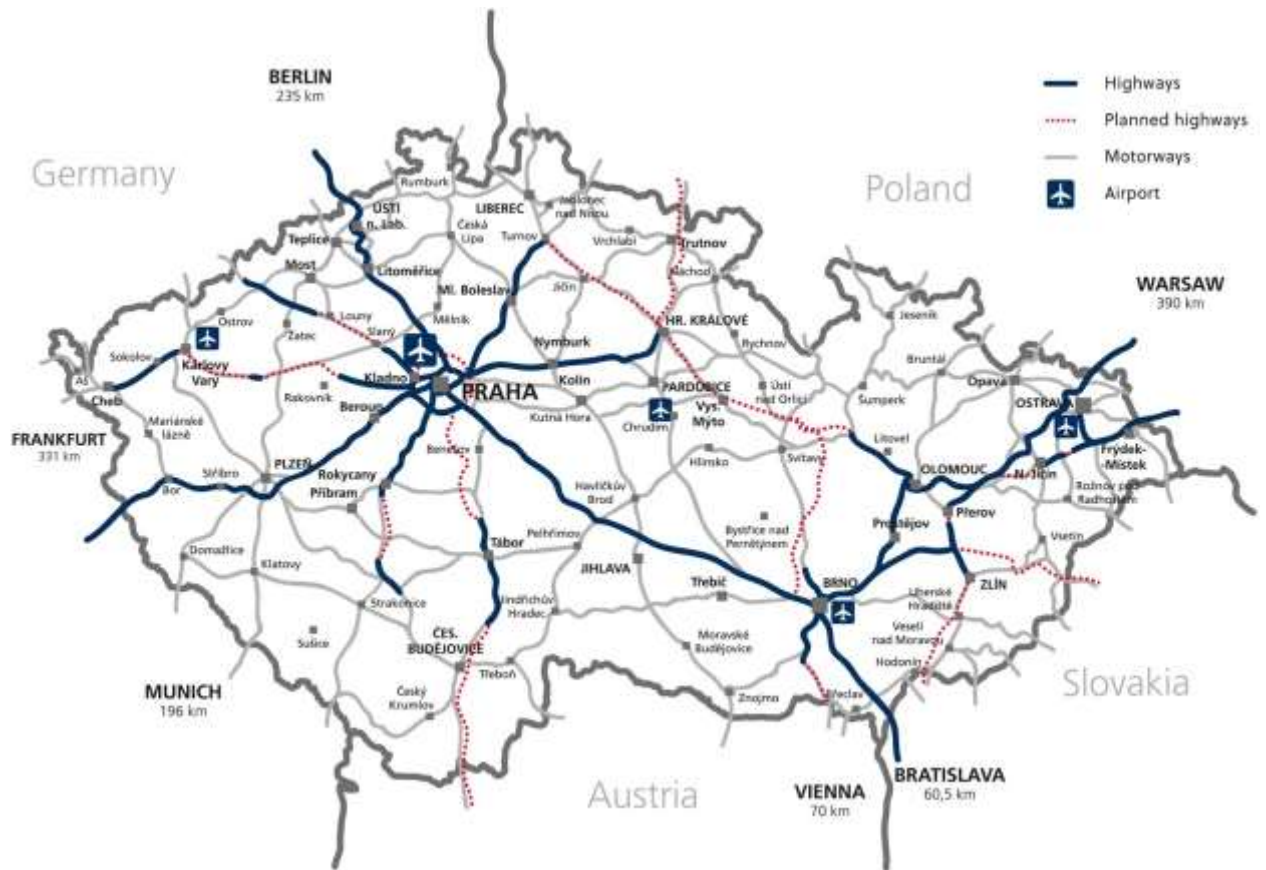
The main reason for the growth in the Czech Republic was soft infrastructural reforms, but also, we need to remember that there was one more reason of the success of Czech Republic, and this reason was hard infrastructure, alongside with location. The Czech Republic has one of the best-developed road, railway and airports infrastructure in Europe (Preysner, 2016). But why hard infrastructure became key for the Czech Republic? Answer is simple: high exports from the Czech Republic and touristic potential, the Czech Republic was ranked as the 30th largest exporter worldwide; its top exports include cars (10% of exports), vehicle parts (6.8%), computers (6.3%), rubber tires (1.6%), and telephones (1.6%), with the top export destinations Germany (30%), Slovakia (7.4%), Poland (5.3%), France (5.3%), and the United Kingdom (5.0%) (Observatory of Economic Complexity, 2017). High export in Germany means that Czech economy is closely related to the Germany economy, and Czech economy can be affected by process in Germany (Šlosarčík, 2011).

Totally 84% of Czech exports go to its neighbouring countries, because of landlocked position of Czech Republic (Preysner, 2016) as it can be seen in **Map 1**. Road and railway

infrastructure in the Czech Republic have high importance and it is very well developed; there is very big demand on railway and high ways because of high export and trading with neighbours. 84% export go to neighbour countries, developed infrastructure helping with this export, to decrease delay and increase speed of movement goods and people, increase liquidity of money.

Future leaders and leaders of the developing countries can take examples of many countries, they can take example of Czech Republic with free industrial zones, law reform alongside with changing function of army bases from military to more peacefully economical.

Map 1 Transport Infrastructure in the Czech Republic, 2016



Source: czechinvest.org

Map 1: shows infrastructure of the Czech Republic, what is still under planification and construction, because of infrastructure developing process that is continuously in process and cannot stop, cannot be a developed at all. It doesn't have maximum, government always can modernize, always can develop new infrastructure, because of new technologies. These technologies always go in front, and developing process is following technologies.

Practical Part

4 Infrastructure in Georgie

Country Georgia, **Map 2**, former part of the Soviet Union (independence gained in 1991 year after occupation of Democratic Republic of Georgia in 1921) is in Caucasus region of Europe, on the cost side of black sea. Georgia haves 4 neighbours, 3 former soviet union members, Russia, Armenia and Azerbaijan and one member of NATO, Turkey.

Map 2 Location of Georgia



Source: Worldatlas

All those countries more or less are in developing process, a special Armenia, Azerbaijan and Russia what haves affect also on developing process of Georgia. Beside of underdevelopment of the neighbour countries another problem in process of development of Georgia is presence of Russian forces on two occupied territories of Georgia (Abkhazeti and Tskhinvali region) and conflict between Azerbaijan and Armenia (Conflict in Karabakh).

population of Georgia at moment of last census (2016) is 3 787 000 million, land area 69, 700, type of government Semi Presidential Republic, GDP per capita of population is 10 100 US Dollars, GDP (PPP¹) 37.27 billion (World Atlas, 2019).

War in the beginning of 90 in two regions of Georgia against separatist forces supported by Russia, civil war and political crisis destroyed infrastructure in Georgia as well as economic crisis after falling of Soviet regime (transformation from planned to market economy). But by the time, after Rose Revolution in 2004 Georgian economics start growing with improvements in basic infrastructure, but after fast grow till 2007, in August of 2008 war with Russia again slowed down growth of economics, war plus global economic crisis decreased growth of GDP of Georgia from 7% till -10-12%.

In next chapter I will provide wider information about historical way of Georgia from fast economic growth till stable development and I will try to show transformation of Georgia from destroyed post-soviet country till now days fast developing country.

After Soviet Union fall Georgian infrastructure was collapsed, roads were destroyed, railway communication and airports were unfunctional and seaports were abandoned or even robbed, factories were destroyed, production was on minimum level, part of that infrastructure was sold in Turkey and Russian Federation. Infrastructural collapse by the time become biggest issue for the population of country. In beginning of the 90s, people faced problems with electricity, water, garbage and sewage collection. Most part of the Georgia was out of supply of water and electricity, even in capital it was impossible to have fresh water and electricity 24 hours (people were forced to make bonfire in the streets to be a warm at winter and make food). Sometimes water or electricity was provided in few cities, but it was provided only for 1-2 hours per day, in the morning and evening time. Day by day the situation was not promising changes. Problems become critical, it was not possible to get normal medical help, support from police, transportation, be warm in the winter, have sanitary and wash clothes, take bath etc. it was already twenty-one century. In period of Eduard Shevardnadze (second president of Georgia) government was totally corrupted from ordinary police man and doctor in the hospital till state officials.

With hard infrastructure in the country was destroyed also soft and critical infrastructure (no gas reserve, no food storages, no full functional hospitals, electricity, gas, water supply, roads, railway communication, no governmental structures, police, army,

¹ Purchasing Power Parity

emergency services etc.) Besides that, country's budget didn't get enough money, corruption was affecting budget. not functional ministries, police, in the army soldiers was hungry and without proper equipment, also plus problems what I said before, from 1991 till 1993 Georgia had 2 conflicts in regions and one civil war. Edward Shevardnadze, president of Georgia doesn't want to help people, use his power. Hopelessness, people without food, clothes, people without future, people who before had satisfied life in those days become poor and "homeless" because of don't having functional government. After 10 years of falling Soviet Union 1 million Georgians went in to migration, finally after 13 years, in 2004 people start protesting corruption, poverty, falsification of elections etc. This protest movement, where involved was practically all population of the country was called Rose Revolution.

Revolution with new leaders with European education and experience become successful for a country, this revolution was big impulse for developing process. Directly after elections of new president Mikhail Saakashvili, problems with supply of electricity and water were fixed, people after 14 years first time get proper water supply and electricity, at the same time the country's government start fixing roads and other basic infrastructure which was showed to Georgia by incredible GDP growth in the short time period. According to Asian Development Bank, in this period Georgia's economy expanded by 9.6% annually, on average during 2003–2007. Georgia's gross domestic product per capita rose from \$916 in 2003 to \$3597 in 2013, GDP growth averaged nearly 6%. Georgia was classified as a lower-middle-income economy.

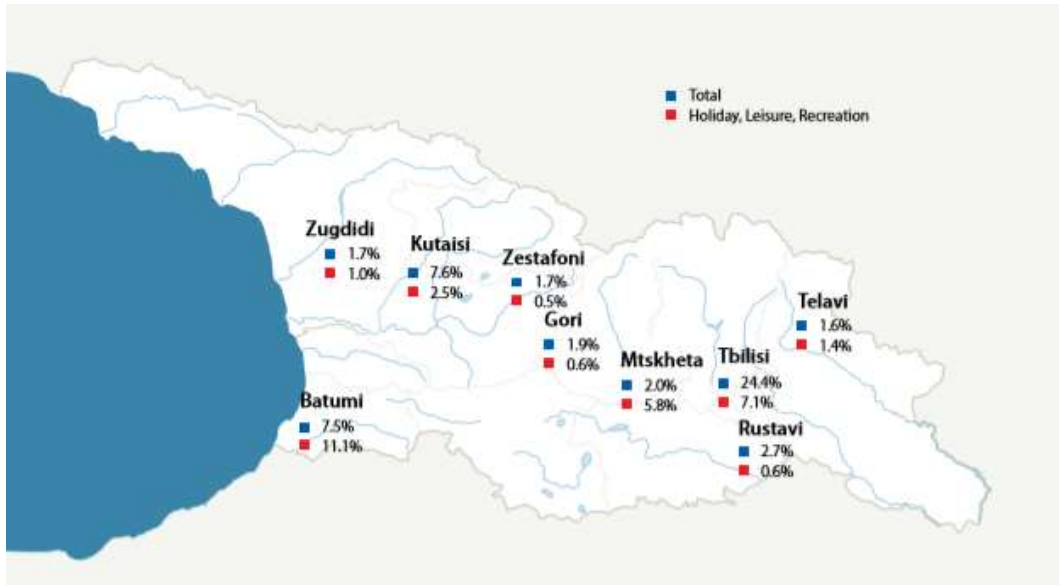
Besides hard infrastructural changes in Georgia, people faced soft infrastructural changes, the government has streamlined business regulations, liberalized trade policies, simplified the tax system, reduced the size of the civil service, and privatized government assets, make easy access to all governmental structures and developed E-Government system (online, electronic government), As a result of changes in soft and hard infrastructure, governance and the business environment have improved, Georgia's ranking in several international indexes has risen (Country Partnership Strategy, 2017).

4.1.1 City Batumi as an example of changes and growth

With decreasing of regulations and increasing of infrastructural development (roads, gas, electricity, sewage), people in city Batumi has seen high, before unseen economic growth, from little sea trading port, city Batumi become popular touristic destination, second popular place in Georgia after capital Tbilisi and second largest city by population. As you

can see from **Map 2**, most visited destinations in Georgia are capital Tbilisi with 24.4% visits totally and Batumi with 7.5% visits, but if by general visits Tbilisi is leading, by holiday and recreational reason travels Batumi is number one in Georgia.

Map 3 Most Visited Destinations in Georgia, 2016



Source: National Statistics Office of Georgia

Nowadays attractive for tourists and investors, one of the highly developed cities in the region, in the beginning of 2007 Batumi faced infrastructural boom and unplanned, chaotic development, if city centre and sea side area was fully developed, deep inside of city, infrastructure was still stocked in beginning of 90s (this area of city just had water, electricity, gas and old sewage system). But year by year of developing, development process finally went inside of city and government start changing water communications and network, start making roads and pedestrian walking areas, developing parking spaces, etc. for example Batumi was one of the first city in Georgia were was built sewage treatment system what can clean all sewage water from the city and nearby areas (before dirty water went directly inside of the sea without cleaning).

Increase in infrastructural sector increased turnover of construction sector, with developing of this important sector salaries also increased and become one of the highest in Georgia. Georgian Statistical Office provided very interesting statistic about turnover; from **Chart 6** you can see turnover in construction sector of Georgia from 2006 till 2017 and after prediction*

Chart 6 Turnover in Construction Sector of Georgia, 2006-2017 (billion GEL²)



Source: own calculation according data from National Statistic Office of Georgia

We can see that in 11-year turnover of the construction sector increased by 7 times. Construction sector besides of the apartments, hotels etc. Includes infrastructural development of nearby areas of constructing sites and increasing the liquidity of money, for example, the fast development of seaside area of city Batumi changed the economic and social structure of the city. If a seaside area of the city was most developed place in Georgia, as I mentioned before a back side of the city still was undeveloped and stocked in the 90s, reason for this was attractive position of the seaside are of the city and good development of infrastructure in this area.

On **Picture 1** you can see example of developing seaside street in city Batumi (before developing here was nothing as you can see on the picture, but after here is skyscrapers, casinos, and hotels and developing process is still going)

² Georgian Lari (state currency in Georgia)
1 GEL = 0.37 USD at the rate on 2019-03-11.

Picture 1 Changes in city Batumi



Source: Twitter, Paul Bakhmut

4.1.2 Construction Sector and Another Part of Georgia

By the time, developing process touched all areas of Georgia but some regions are still less developed than another, in some regions of Georgia is hard to attract investors and money, without investors developing process in those regions sims like planned economy, where government artificially trying to increase spending in economics of the region, but as we know from history, without natural demand and natural production it's not working well. For all regions of Georgia government did basic infrastructure, like roads, electricity, gas, etc. but still cannot attract investors to diversified development of economics, common part of investments still going in few regions of Georgia, including city Batumi, capital Tbilisi, and mountain winter resorts.

Statistics from **Chart 7** provided by Georgian Statistical Office showing to us increase in number of completed construction projects. In 2006 this number was 663 but after 11 years, in 2017 number of completed constructions become 2922, also on this table are showed increasing amount of spending in construction sector in same time period and prediction till 2019.

Chart 7 Spending's and Complited Constructions in 2006 – 2019* (Million GEL, Thousand)



Source: own work according data from National Statistics Office of Georgia

From **Chart 8** you can see that in period of 2006-2018 number of people who were employed directly by the construction sector was increased 2 times.

Chart 8 Number of persons employed in construction sector of Georgia (Thousand) 2006-2021*

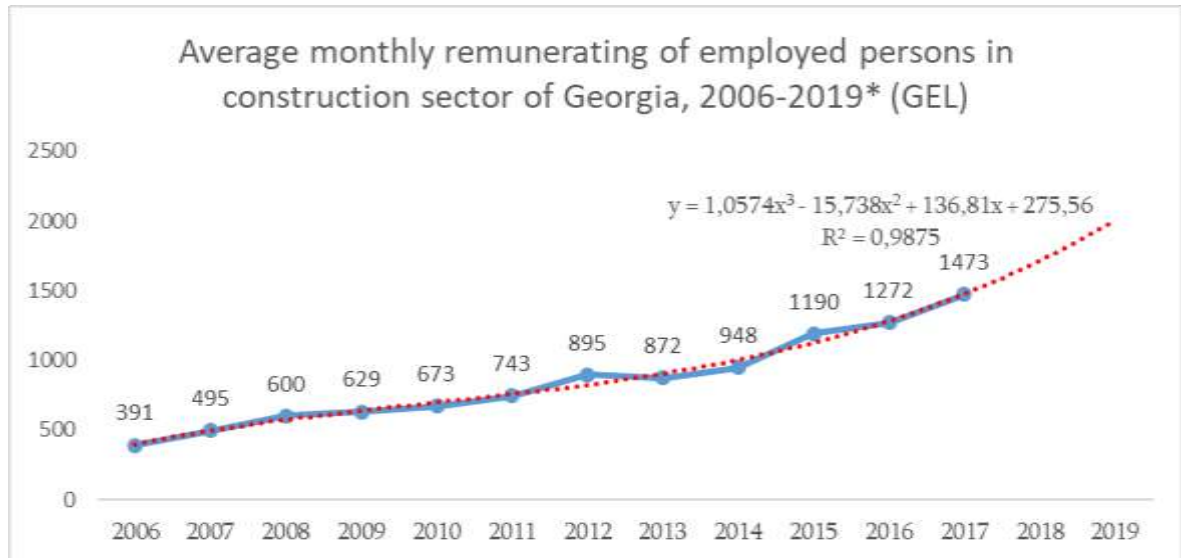


Source: own work according data from National Statistic Office of Georgia

Increase of productivity of this sector, positively touched salaries, for example in private sector one of the highest salaries you can see in construction sector. In city Batumi and Tbilisi developing process increased professionalism and quality of work of some companies

of mentioned sector, because of this process in this city were established some professional and good companies. As it was mentioned before, salaries in this sector increasing by the year what you can see from **Chart 9** provided by National Statistical Office of Georgia

Chart 9 Average monthly remunerating of employed persons in construction sector of Georgia, 2006-2019* (thousand GELs)



Source: own work according data from National Statistic Office of Georgia

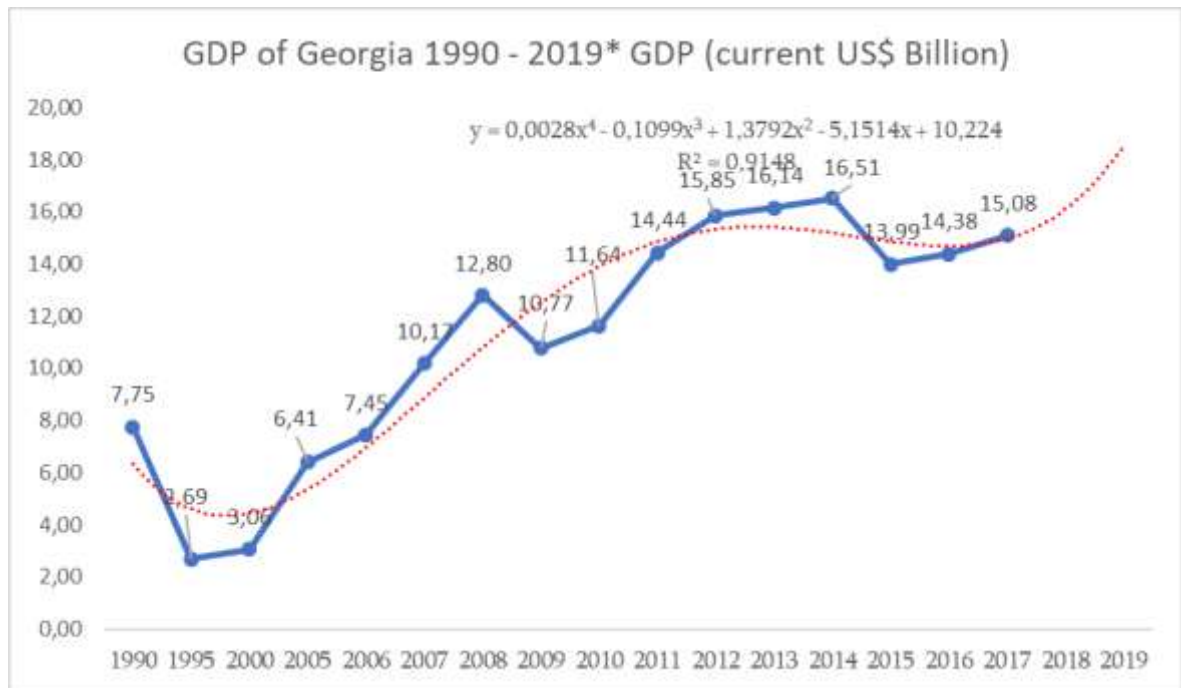
Average salary in the construction sector were increased 11 times from 391 GEL to 1400 GEL.

4.1.3 GDP growth in Georgia

Increase of the construction sector indicates that GDP in country is growing, developing process is going well (interest from investors, big movement of money inside of the country). If the GDP of Georgia in the 1990 after falling of soviet union was 7 553 billion USD, in 5 years he decreased until historical minimum 2 513 billion USD and from 1995 GDP just increased in 2003 up to the 3.911 billion USD, in 8 years country's GDP increased only by 900 million USD, when after Rose revolution only just in 1 year between 2003 and 2004 GDP growth was more than 1 billion, from 2004 GDP continued to grow and because of that in 2006 GDP of Georgia increased 3 times and become 7.745 billion USD.

As you can see from **Chart 10** changes in government (soft infrastructure) and changes in infrastructure (hard infrastructure) had positive response from business and investors, what affected positively GDP of country.

Chart 10 Growth of GDP in Georgia 1990-2019*

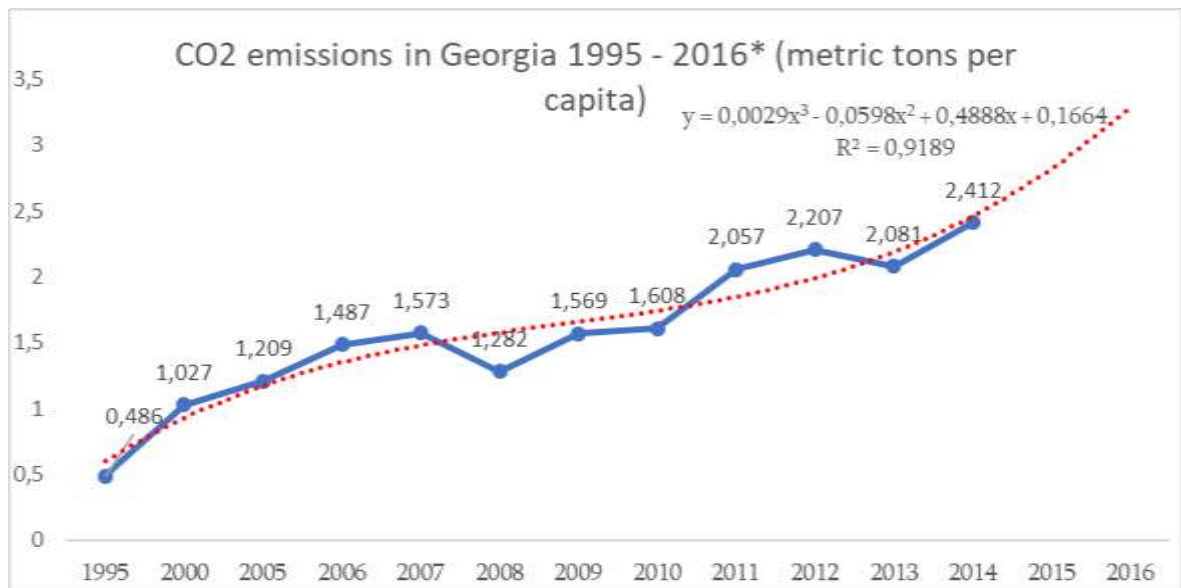


Source: Own calculation according data from World Bank

On this statistic you can see positive effect of infrastructural development on GDP of country from 1990 till 2017 and prediction till 2019*. From my point of view another statistic from the World Bank shows us economic growth according to CO² emission. In beginning of 90s CO² emission was 3.147 metric ton per capita (MTPC) in 1995 it's decreased to historical minimum 0.486 MTPC but after, start little growth to 0.877 MTP in 2003.

Chart 11 can show us that fast growth of CO² after 2003 what was forced by construction sector and beginning of the process of the industrialization. for example, in 2004 MTPC it's increased until 1.018 MTPC and start stabile increase until nowadays, in 2014 CO² emission level reached 2.412 MTPC, just in 10 years CO² emission level increased 2 times. Of course, CO² emission is bad for health and for nature as well, and government needs to fight with this but in the beginning of development its indicator for economic, it's shows that development is going and economic is increasing. Period without growth of CO² emission, was period of economic stagnation, when country don't have any economic activity and GDP growth. In future, when economy will become advanced, CO² emission will decrease, but its will be indicator of sustainable development of the, but before it is a signal of economic growth, in 90s low CO² emission was symbol of destroyed economics and increased poverty.

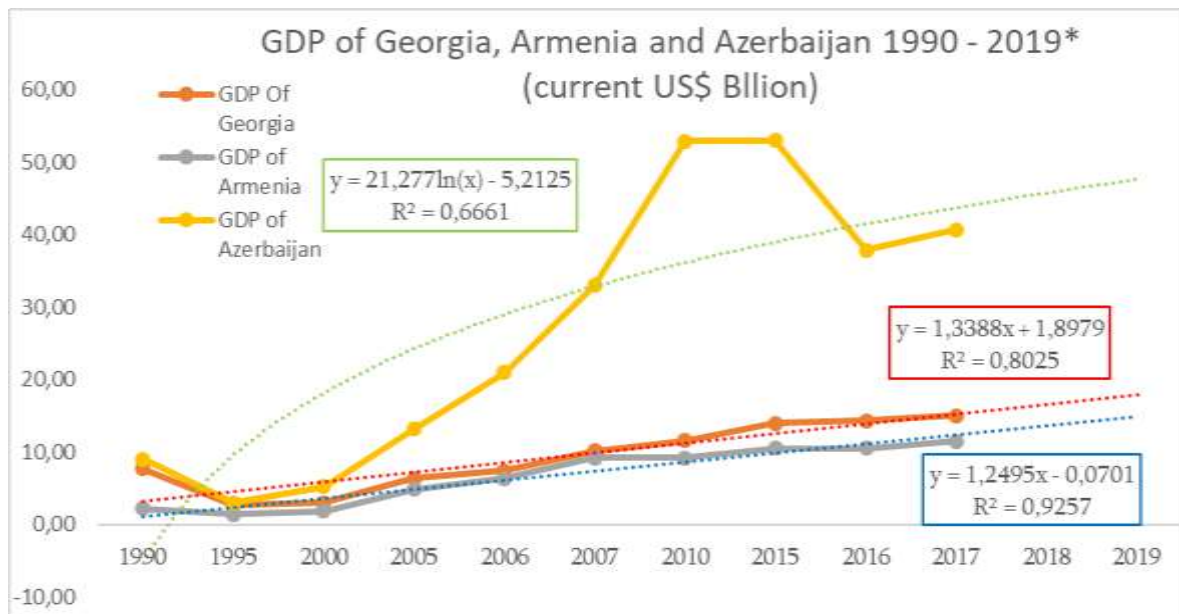
Chart 11 CO2 emission in Georgia metric ton per capita, 1992-2016*



Source: Own calculation according data from World Bank

After 2007, GDP of Georgia increased from 7 Billion till 15.16 Billion USD, to compare Armenia's GDP in 2017 what was only 11.54 Billion, from 3 post-soviet countries of Caucasus region, highest GDP have Azerbaijan but here is small difference between Georgia, Armenia and Azerbaijan, Azerbaijan have oil and gas what is increasing GDP of country but still besides of oil and gas, as usually is happening in those kind of countries, country is less developed than Georgia, for example in Azerbaijan still existing corruption and low level of services in the government. **Chart 12** giving to us good example of economic growth in these 3 countries.

Chart 12 GDP of Georgia, Armenia and Azerbaijan, 1990-2022*



Source: Own work according data from World Bank

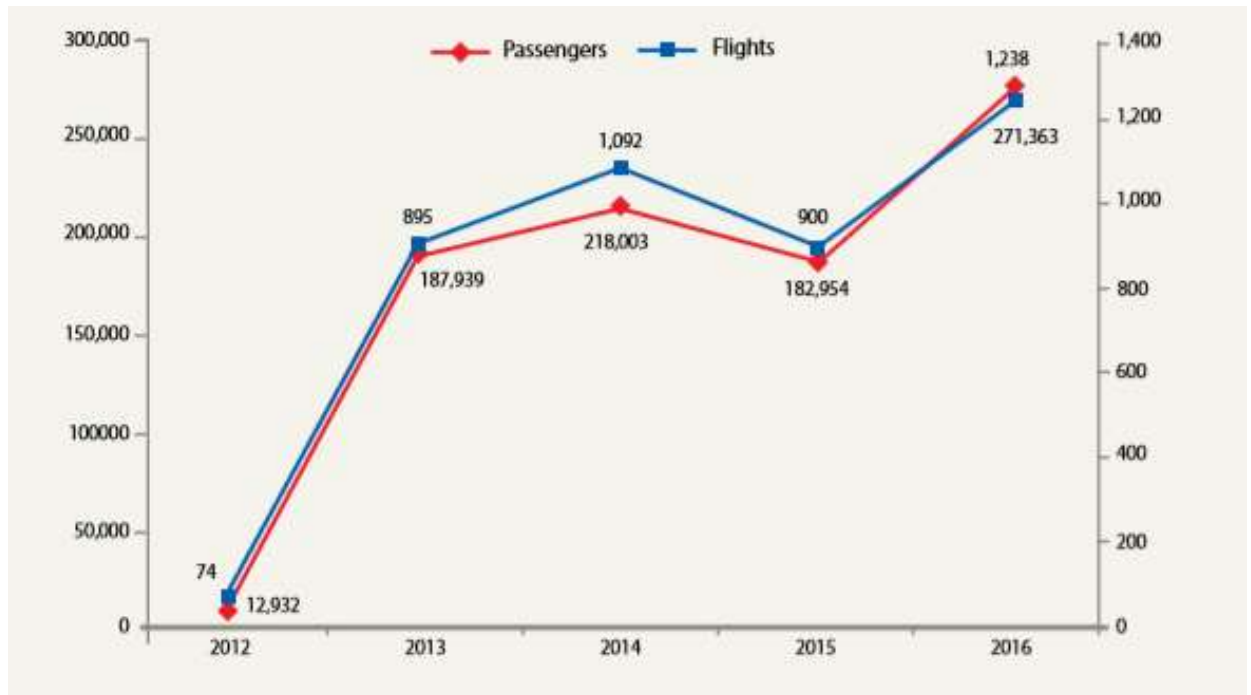
4.1.4 New Economic Policy in Georgie – Stable development

After chaotic and fast development of infrastructure in Georgia till 2008, Georgian government change policy to a more stable and wider development of infrastructure, but 2008 year was hard for country because of war with the Russian Federation and global economic crisis, war and global economic crisis decreased fast growing GDP of Georgia and slowed down economic growth.

In 2010 government start developing new projects like new international highway across all Georgia (East-West highway), railway connection to the Turkey from Azerbaijan what connected Asian region to the Europe, new airport in Kutaisi for cheap flights across Europe (**Chart 13**), new dams for producing electricity and stabilization of growing demand on electricity, gasification of rural areas, modernization of Batumi international airport and Tbilisi international airport, modernization of railway and railway stations, new European standards trains, modernization of Tbilisi metro and opening new metro station, planned connection of capital Tbilisi to the city Rustavi by metro line, in future this projects will have positive affect on economics, by opening new markets for the business and making easy movement of people.

For example, connection of two cities will make movement of people easier, connection of Georgian railway to Turkey railway will make movement of goods and passengers from Asia to Europe cheaper, faster and easier what will have good effect on economics in long-term period.

Chart 13 Kutaisi International airport thousand passengers and flights, 2012 (opening) till 2016 (nowadays quantity of passengers is up to 500 000)



Source: Georgian Civil Aviation Agency

Development of new international highway it's most important project for Georgia with new railway road to Turkey to relive old Silk Road from China to Europe. New railway communication with Turkey will decrease time for transporting goods from Asia to Europe from 30-60 days (by ship and Russian railway) till 15 days by railway transportation from Georgia to Europe, this project also will include developing seaport of Anaklia.

In sea side region of Samegrelo, near little city Anaklia it started to build a new deep-water port to decrease the quantity of time what is needed for good to travel from Asia to Europe and increase transit potential of Georgia. First phase and operation of port will start in 2020 and port will have possibility to get cargos from different regions of Asia and Caucasus as well as from Europe. at all port and new silk road can reach 147 million people around the region (Caucasus, Asia) for new port Georgian government will provide new railway and road communication.

This seaport is biggest project in Georgia, "This is where Europe meets Asia, and that is what matters most. It is here and now that a new Georgia is being born. This place today lays the foundation of a new Georgia," said Giorgi Kvirikashvili (former premier minister of Georgia) on December 24, 2017, launching construction work on Anaklia Deep-Sea Port (Shakhil Shah, 2018) cost of the project will be 2.5 billion USD.

Georgian government from 2013 year involved strategic plan “Georgia 2020” what includes inside 4-point plan about rapid development of country and regions, it’s includes inside Infrastructural Development, Improvement of Business Environment, Promoting of Open Governance, Education Reform (Axes of Georgia’s Long-Term Growth Strategy, 2018). Practical everything what is important for the development of the country and long-term growth of GDP and for attracting foreign investments.

The Infrastructural Development plan includes inside

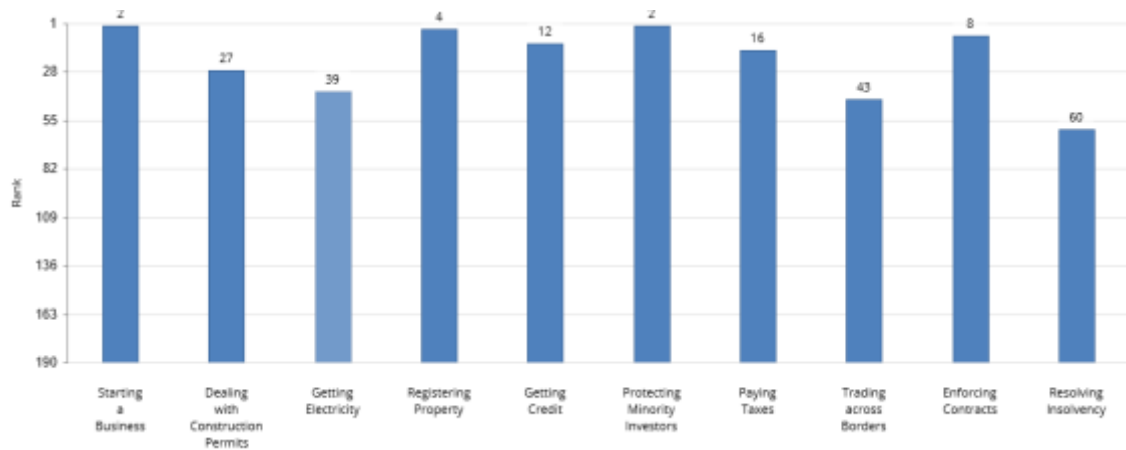
1. Road Infrastructure
2. Land Reform
3. Expansion of the South Caucasus Pipeline through Azerbaijan and Georgia
4. Spatial development

And the Improvement of the Business Environment including

1. Deposit Insurance
2. Pension Reform
3. PPP Framework
4. Capital Market Reforms
5. Insolvency Legislation
6. Public Investment Management Reform

By the time of development and introduction of innovations Georgia become a most economically-free country in emerging Europe (first place) and took 9 places in the world by doing of business freely, but according new statistics from World Bank, from **Chart 14** you can see that in 2018 Georgia improved position in doing of business freely from 9 to 6 by improving services from government and changing law of taxation (making new model where investor can don’t pay tax for income if they will return money in companies turnover for future investment), in Georgia it’s possible to register business with one window principle, it’s means that after little procedure in Public Services Hall you will have possibility to do your business in same day after registration (in World Bank statistics Georgia haves second place in starting of business)

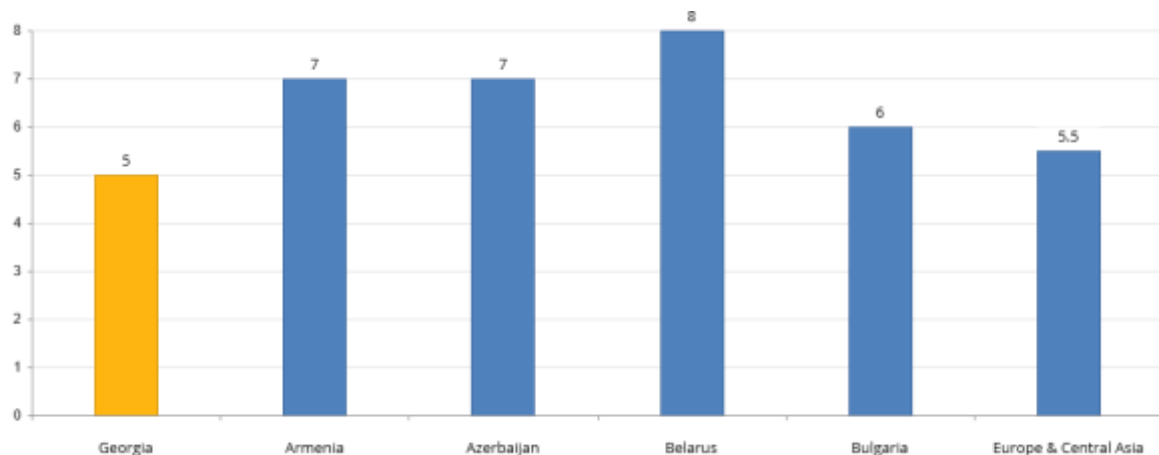
Chart 14 Rankings in on Doing Business topics – Georgia (2018, 190 countries)



Source: World Bank

One more improvement in Georgia, according to the World Bank improvement touched electricity infrastructure and possibility to get electricity easily, World Bank paying big attention to this component because of it's one of the most important part of the country's infrastructure and important also for doing business (development) (**Chart 15**).

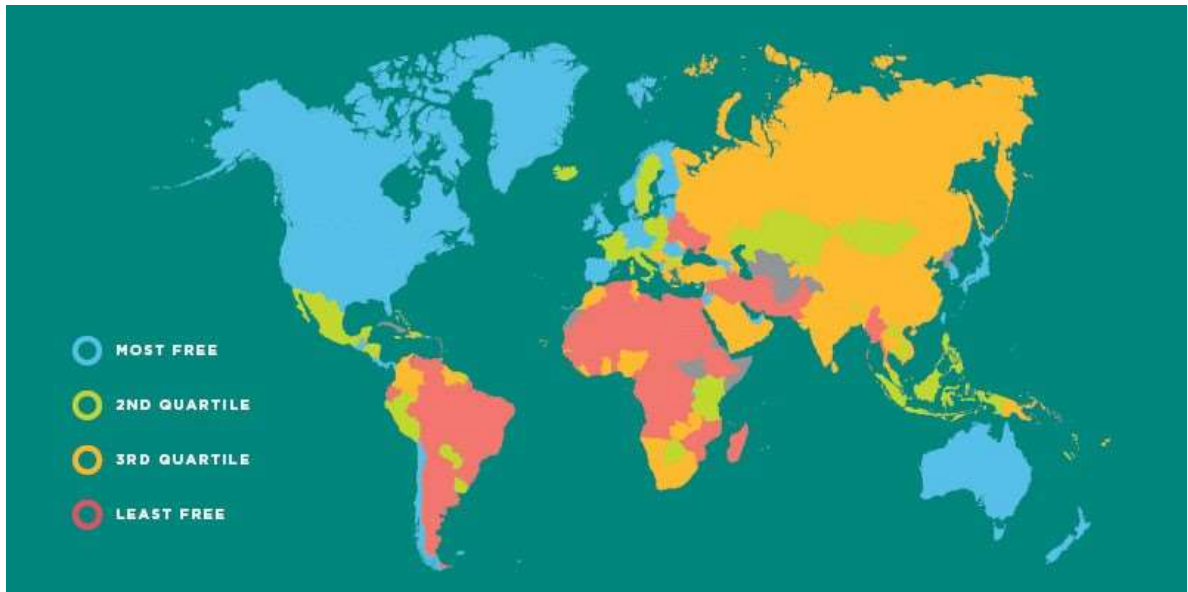
Chart 15 Getting Electricity in Georgia and comparator economies – Measure of Quality (2018)



Source: World Bank

And how you can see on **Map 4**, Georgia standing shoulder to shoulder with big countries like USA, Canada, Australia etc. with doing business easily, Georgia in doing business easily have passed countries like USA, Norway and Great Britain and take position 6 in the world competition.

Map 4 Economically free countries where doing business is easy and safe



Source: Fraser Institute

4.2 Analysis of existing infrastructure in Georgia

4.2.1 Natural gas

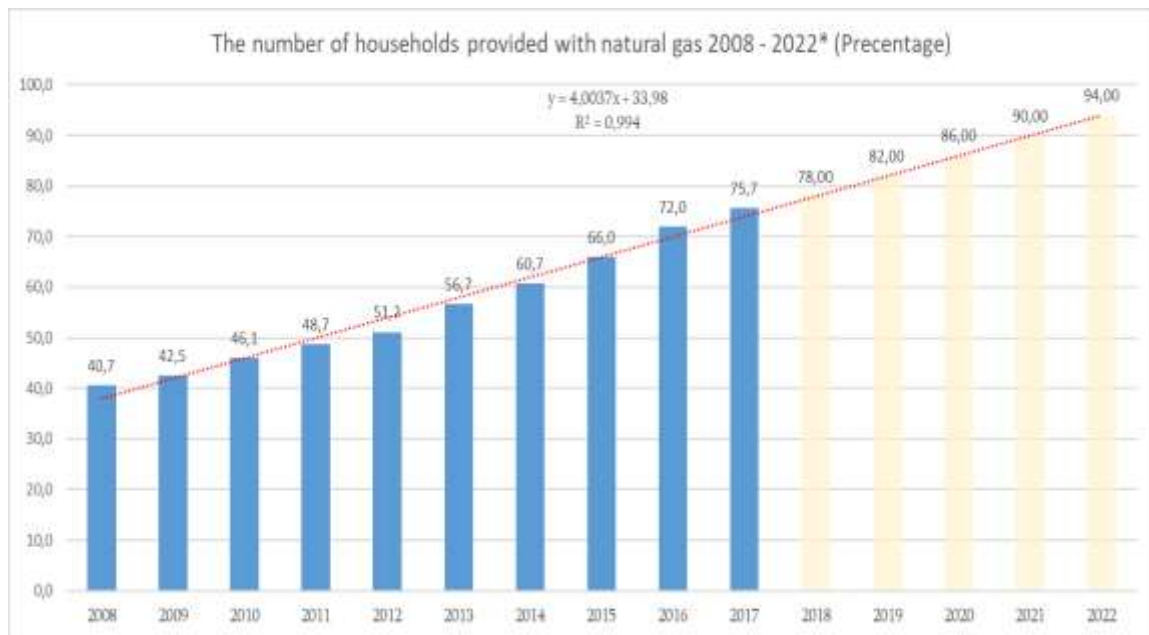
In 2004, after revolution and changes new government faced critical situation in infrastructure, most important part of infrastructure of country was destroyed, sanitation, water, gas, electricity, roads, buildings, services, railway, bus and railway stations, airports, sea ports, custom service and etc. with destroyed infrastructure country faced highest corruption level in Europe and all over the world, practically every structure of government was under corruption and budget of country was out of control.

First what new government of Georgia did, it was fight against corruption, restructuration of police, army, ministries and after fixing of soft infrastructural problems (of course in the beginning they fixed problem with electricity because without this it was not possible function of government and critical infrastructure, but real development start little bit later) they start improvement of the hard infrastructure, in this chapter I will make more concertation on hard infrastructure, I will show changes in hard infrastructure, how it was developed and how it's affected GDP, economic growth and life of people.

For example, in the **Chart 16** we can see growing percentage of covering Georgian territory by natural gas, natural gas it's important part of the county's infrastructure because of it's used in households for heating and for the cooking food.

before 2006 in Georgia natural gas was provided for households in very low amount, probably only in capital and some central places of cities but after 2006 gasification process cover all cities of Georgia, after covering all the cities gasification process went to the villages an rural areas and process of gasification is still going, My village Natanebi in region Guria was connected to the central natural gas system by pipeline in 2016, contractor company of the government bring gas pipeline directly to the every house for free, only payment what should be payed from household it's price of pipeline from central pipeline till kitchen (or another place).

Chart 16 The number of households provided with natural gas 2008-2022* 3(Percentage)



Source: Own calculation according data from National Statistics Office of Georgia

Benefits of natural gas are not limited only by households, natural gas is used in business (different kind of industries) for example, natural gas is cheaper then electricity what means that it's beneficial for restaurants, baking enterprises, hotels, manufacturing and heating of big office buildings as well as newly built living apartments and houses, natural gas also hases another positive effect, that effect is closely related to the nature, natural gas is

³ From 2018 forecast by simple linear regression mode

producing less CO² and residuals than coal or oil what means that situation in rural places or cities will change slightly.

Other example from my city is that before gasification in the winter time all city was embraced by smog from heater what used for heating wood, it was like fog, hard to see what is happening in front of you and quality of air was very low, later after 2006 people start feeling changes, in winter of 2007 by the developing natural gas network, in city was less smog and better quality of air, in 2008 it was very rare to see houses with old heating system and finally in 2009 old heating systems disappeared and nowadays only natural gas is used for heating

Another thing what Georgian government did in 2006 after crisis with Russia (Russian embargo to Georgia and explosion on Russia – Georgia natural gas pipeline) was diversification of natural gas import. In winter of 2006 (it was one of the coldest winter in Georgia, last 20 years) pipeline what supplied Georgia from Russia by natural gas was exploded (Georgian government classified this explosion as diversion from Russian Federation) because of that explosion capital Tbilisi and another part of Georgia was discarded from natural gas system, people was freezing, households don't had gas for cooking food etc.

In order of this situation Georgian government decided to change Russia to more stable and friendly partner Azerbaijan, who nowadays providing most of the natural gas to Georgia by safe and protected pipeline. But diversification of resources not means that country is safe fully, in 2018 Georgian government decided and start planning of building natural gas reservoir to have natural gas in crisis periods, natural gas reservoir it's part of critical infrastructure what is characteristics more for developed countries than developing and building of this kind of infrastructure means that country is moving in correct direction.

4.2.2 Water supply network

Another important, vital part of the country's infrastructure is water supply network, fresh and clean water is vital for the population living in the cities where natural sources of water are not available. If in rural areas people can find natural sources of water in cities population is fully depended on central water system, situation with water system before revolution was little bit better than with natural gas, but not exactly good, before revolution in 2004, water for households was provided with schedules, for example in the morning time 6 o'clock for 1 hour and after in night time again for 1 hour or if you been lucky maybe for 2

hours, and usually water don't had enough pressure to go up in high buildings like 5 floor building, people was forced to go down to use tap for cleaning clothes, fulfilling reservoirs of drinking water and water for bath. I still remember how my mother was going down to clean our cloth for school, or how I was drinking water from special jaw for water in the kitchen, in my mind, when I was children it was normal think and I never thought that water can be provided 24 hours or to have electricity it's normal thing, I was used to live without stable supply of electricity and water.

After revolution, with development of natural gas system, government start fixing problems with water, problem with water was more easy to fix because pipelines, old, in bad conditions but still working were existing from soviet union and in cities it was possible to get fresh water without big changes, more problematic were rural areas and it's still problematic, after falling of Soviet union, existing system of pipelines in rural areas were sold buy corrupted officials in junk, it was easy to stole, take and sell this pipelines because they were not buried under ground, they were upper to the ground to compare cities where they are underground and it's hard to stole for selling.

Before 2004, 50% of Georgia had connection to the fresh water system, but problem was bad service of water stations and bad management (if management existed at all) schedules, quality of water, no pressure in pipelines etc. was biggest problem of 50% of population, first what government did it was increase of budget for state companies how provided water, to fix problems in pumping stations, increase salaries, increase quantity of workers on stations, to improve quality of water and etc. practically after change of government all the cities get access to fresh water without schedule, people get possibility to wash clothes, make food, take bath at home, without going out, 24 hours 7 days per week, happiness of people was very high.

President of Georgia in this moment, Mikhail Saakashvili get very big popularity, he was very popular before elections but after elections his popularity went higher, people was meeting him as national hero, saviour, and it's possible to understand those people, people had hope that everything will be fine after dark and poor period, period of chaos.

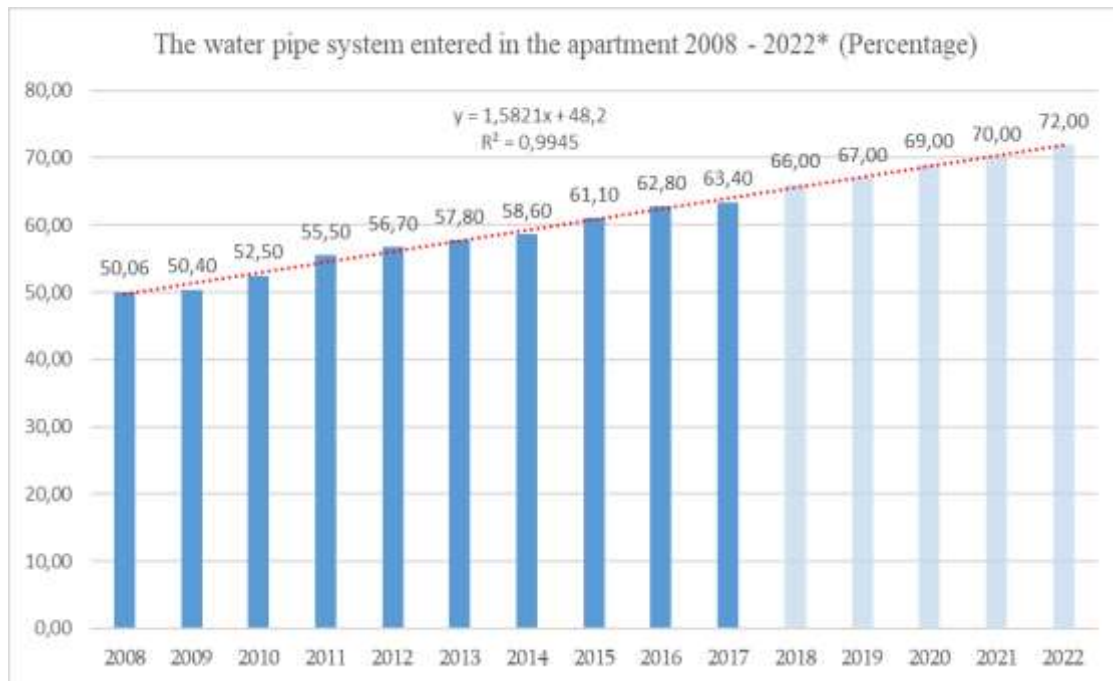
Slightly later, when budget of water providers was increased government start planning modernization of infrastructure in cities with help of development bank of Germany (KfW) who provided cheap loan for modernization of existing infrastructure and developing new. Process of modernization touched all cities in Georgia. In my city Batumi, process was divided on 4 parts, all this parts was divided in years and by districts, for example first part was modernization of existing infrastructure in old town of city Batumi, old town was chosen

because of very old water infrastructure in this district, sometimes age of pipelines was near to 200 years, but average 100, after changing infrastructure in old town, old town start transformation, becoming more beautiful and popular, and now this district of Batumi is one of the most popular place in the city.

Actually modernization process touched not only fresh water but also sanitation system, all water system was under modernization, when phase 1 was end, phase 2 was started, phase 2 included inside central districts of the city, after finishing modernization of central districts in 2016 phase 3 was launched, this part of the modernization touched suburbs (Batumi it's little city and suburbs it's very confusing but we can say that phase 3 was touching area what is not included in city centre) phase 3 was important because suburbs of city were still undeveloped, without asphalt and pedestrian walking areas, business don't had possibility to develop because of no enough infrastructure, finally when phase 3 was done, phase 4 started, this phase includes inside rural areas of city, some villages and etc.

I want to mention that interesting moment of this modernization project was after process of modernization, after process touched also my district where I live, after ending up with underground infrastructure 6 month later usually government announced tender for road works, road works included inside, tie up of asphalt and pedestrian area, modernization of electricity infrastructure (putting underground) and fixing minor infrastructural problems, in **Chart 17** you can see how percentage of connected households to the central water system is increasing, data was available from 2008 till 2017, after 2017 it's a forecast if government will follow same trend of developing pipelines, if same trend will remain in the end of the 2022 year, 72% of Georgian territory will be connected to the central fresh water system, what will be very nice benefit for the business as well as for population, manufacturing industry will have opportunity to be a developed in rural places where price of the land and work force is cheap to compare cities and suburbs, it will make more attractive rural areas and will make diversification of country's economy, it is way combination of water and natural gas pipelines, asphalt and electricity is important for a country, it's making good opportunity for business and increasing benefits for the people.

Chart 17 The water pipe system entered in the apartment 2008 - 2022⁴* (Percentage)



Source: own calculations according data from National Statistics Office of Georgia

In addition to the water supply network modernization, Georgian government start developing in every city sewage water treatment system, also in rural areas country will develop centralized sewage water treatment system (because of size of villages and little towns water will be collected together and cleaned in one centre in each region, for example in 2010 in city Batumi was developed one big facility for sewage water treatment, water after cleaning going deep in the sea (deep in 5 km), in future there is idea to use this water for irrigation, also after process of cleaning is selling and used in some industries, this treatment system also serves nearby villages because of amount what it can clean.

⁴ From 2018 forecast by simple linear regression mode

Picture 2 Rehabilitation process of one of the streets



Source: bats.ge

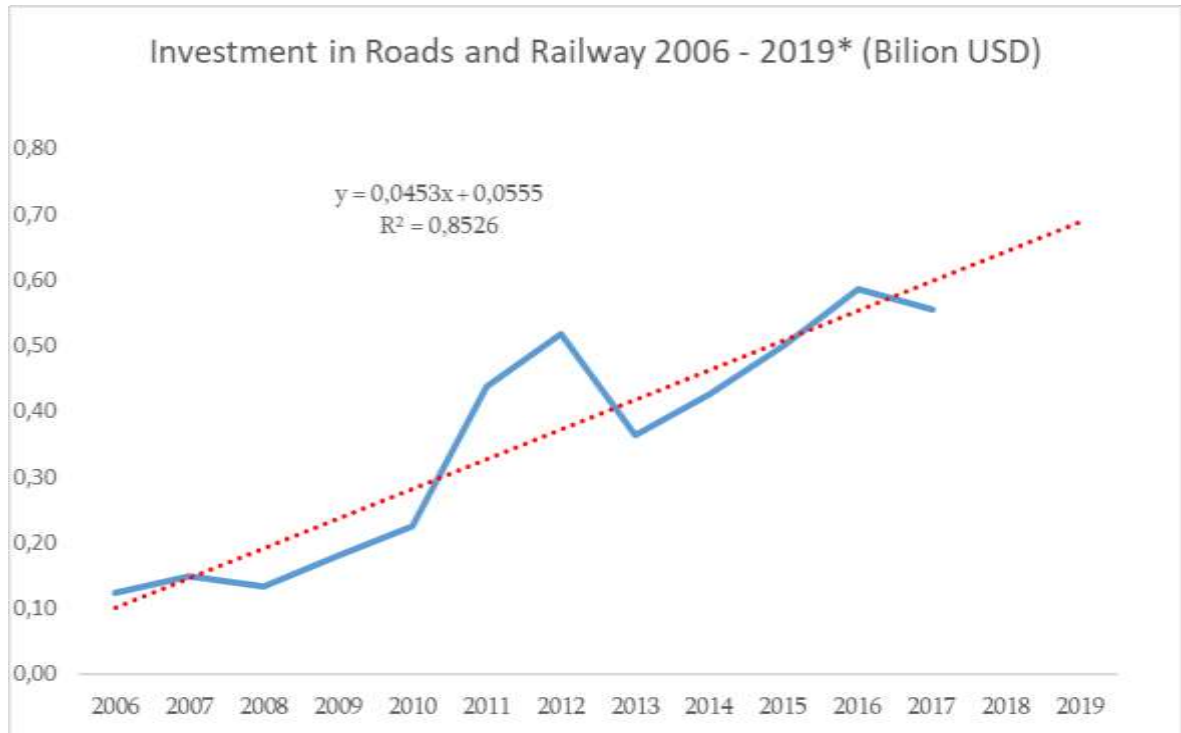
4.2.3 Road and Railway Communication

Proper management and support from government, correct infrastructural development plan can change economic situation in developing country in short and middle term, if developing country with bad government can spend 20 years for developing, from example of Georgia you can see that for this reason (to improve basic infrastructure and start development of advanced) government just spend 10 years (from 2004 till 2014, from beginning of revolution till new government and new policies).

Most important and visible part of changes in Georgian infrastructure it's a roads and railway communication, motorways, highways, railway, airports and sea trading ports, as I mentioned this everything was destroyed in 90s, but by the time process of rebuilding, modernization and development of new roads was launched. Huge project what's idea is to give new life to the old silk road, accelerated developing process of transport infrastructure in Georgia, for better understanding, you can see **Chart 18** where is showed number of money

spend per year for developing roads and railway infrastructure from 2006 till 2017 and after prediction till 2019.

Chart 18 Construction of motorways and railways 2006 – 2019* (Million GEL)



Source: own calculations according data from National Statistics Office of Georgia

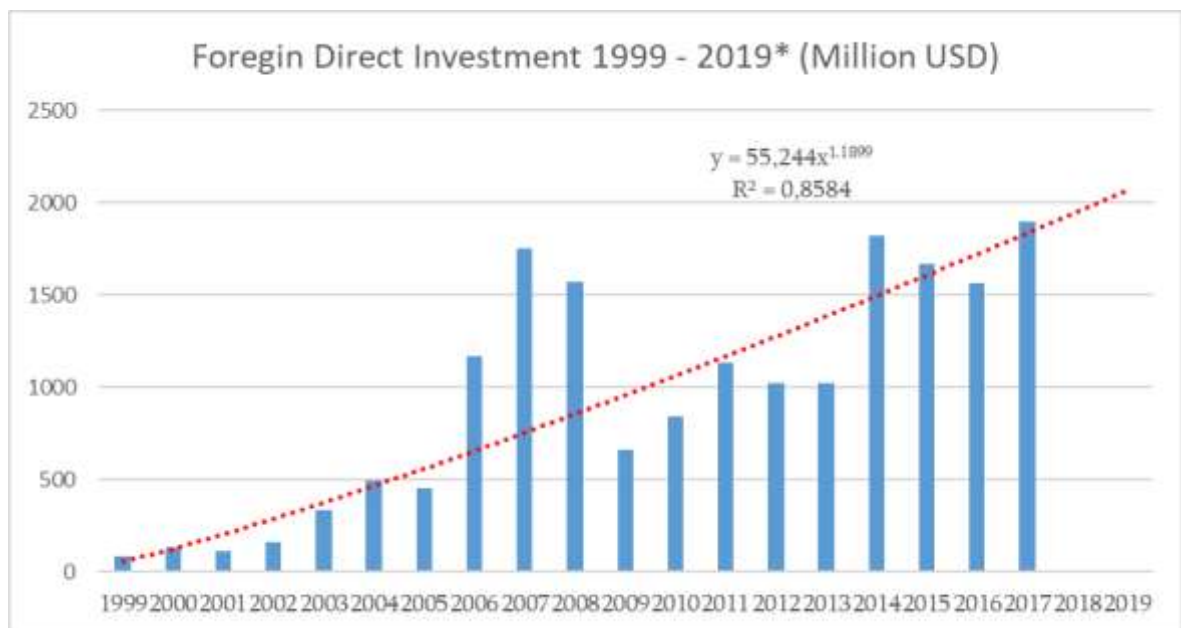
As you can see in **Chart 17**, from 2006 till 2009 there was low spending for this kind of infrastructure but from 2010 spending for motorways and railway was increased and get historical maximum in 2016 when government spend 500 Million USD for modernization and development of new transport infrastructure.

In the beginning of development of roads, government start fixing old roads in the cities by renewing surface of old roads by new asphalt coverage, from cities by the time roads coverage was changed in main internal roads, for example asphalt coverage was paved on roads what's connecting cities and regions between, Tbilisi – Rustavi, Batumi – Kobuleti road etc. after this process government increased spending of money for more far roads, connecting mountains and rural areas and after cities, and finally when all communication between cities and rural areas were fixed government start making new projects like highway between capital Tbilisi and city Batumi, this highway when it will be developed fully will decrease traveling time by 2 hours and traveling time will decrease from 5 to 3 hours, it's will help to

diversify capital city and will increase investments in city Batumi and nearby areas. New highway will cross all Georgia and finally will went to the Turkey what will increase transit form Georgia to Azerbaijan and Caspian Sea, for Georgia it's very important to be in position of leader in region because of location in middle of Caucasus between 4 countries.

Asphaltization and increased amount of money in motorways changed picture of the country, in the past, before 2004, time for traveling was two times more than after modernization between cities, villages etc. even small trip inside of city was very hard and not comfortable, in cities where paved road not existed it was impossible to attract investments to the city, basic idea of infrastructure it's a to support private sector to make investment to improve economics and improve quality of life of citizens, this idea includes inside paved roads, electricity, tele-communication and water supply system. So Georgian government fixed electricity supply, water supply system, tele-communication and finally population get access to the paved road, what was very beneficial for the business (of course in same period there was soft infrastructure changes, simplification of law) but infrastructure had huge role in this period to attract investors, after fixing basic infrastructure investment from abroad start increasing by the year as you can see from **Chart 19**, where is shown amount of Foreign Direct Investments (FDI) from 1999 till 2017, in 2009 you can see that there is big drop in investments, it's because of war with Russian Federation and global economic crisis, but still amount of investment was more than before revolution

Chart 19 Foreign Direct Investments 1999 – 2019* (Million USD)



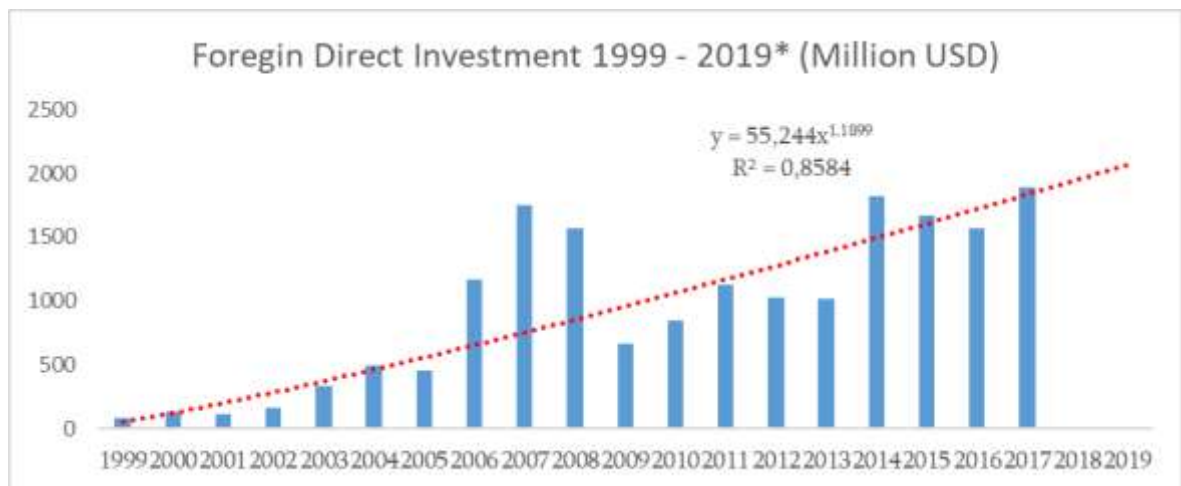
Source: own calculations according data from National Statistics Office of Georgia

From 2007 till nowadays, most of the investment is going in to the transportation, electricity system and construction sector, it's can be explained by big amount of money what is coming in country for developing of highways, railway, for improvement of airports and building new sea trading port in Anaklia.

For better understanding, it's very important to know benefits of paved road, first of all paved road reducing traveling time, reduced traveling time means more activities and more diversification of economics, it's increasing social activity of the people, paved roads helping to students to get to the school faster and safer, helping to workers to get to the job easier, helping sick people to get medical help, giving benefits to the business by increasing supply speed and decreasing costs etc. Paved roads giving to people more inclusive opportunities by increasing access to the market and equality level, also it's can increase quality of life, increase productivity and safety of the people, so every government in developing country should take care about roads, but of course in developing country you need to have good government for this, usually government and related structures in this kind of countries are corrupted and it's big problem for development.

In **Chart 20** you can see length of the roads in Georgia from 2008 till 2016, I took data from 2008 because before 2008 in length to the roads was included occupied territories of Georgia but from 2008 it was excluded to make more real data.

Chart 20 Length of the roads totally (KM)



Source: own calculation according data from National Statistics Office of Georgia

Length of the international roads increasing by the time of building new highway, for example before 2016 length of the international roads was 1603 KM but in 2016 it's become 1666 by launching new part of the international highway, there is no more updated data for

year 2019 but probably after launching new highway to bypass small town Kobuleti to Batumi it's increased till 1700 km or more, on the **Map 5** you can see national roads of Georgia.

Map 5 National and international roads of Georgia



Source: work of user Kotola001

Besides roads and highways country has also one more opportunity to support economics by railway communication, railway communication it's very important and useful for a country and country's economics, because railway allows to transport heavy, high amount of goods in short time period safely inside of country and outside of country as well.

In economics of Georgia need in the railway communication is increasing by the year, with developing of new silk road importance of railway is increased much more than before, with development plan of silk road in 2005 government of Georgia, Azerbaijan and Turkey start planning new railway connection between those 3 countries to connect Asia to Europe by short railway communication, for example to transport goods from South Korea to the Turkey and from Turkey to the Europe it's took only 15 days, decreased time of transportation of goods and passengers are very big benefit for developing countries as well as for developed countries, in both cases countries will have opportunity to went in to new market more easier, also this railway connection is opportunity for Georgia and Azerbaijan to went to the European market by railway.

Another big project where railway will be used as main part of the infrastructure will be Anaklia seaport, what will start operating in 2020 year and will biggest port in Georgia and in the region, idea of this port is to transport goods from Asia to this port by train and after from Anaklia transport goods to the Europe by Black Sea, this port and railway communication as well as connection with turkey will be part of the silk road project, transportation of goods will bring more income to the Georgian budget, increase of GDP, new job opportunities etc. positive affect of railway and road communication I will observe more deeper in next chapter by using correlation analysis. On the **Map 6**, you can see map of Georgian Railway Network.

Map 6 Georgian Railway Network



Source: Wikipedia

4.2.4 Airports and Sea Ports

For country like Georgia, where tourism has an important role, Airport is vital, importance of airports and quantity of passengers that was served by airports increasing by the year and even monthly, 2018 in this case was a record year because all 3 international airports had from 40% to 50% increase of passenger flow. In Georgia at this moment functioning 3 international airports:

1. Aleksander Kartveli Batumi International Airport, this airport is in popular touristic city Batumi, near Black Sea side

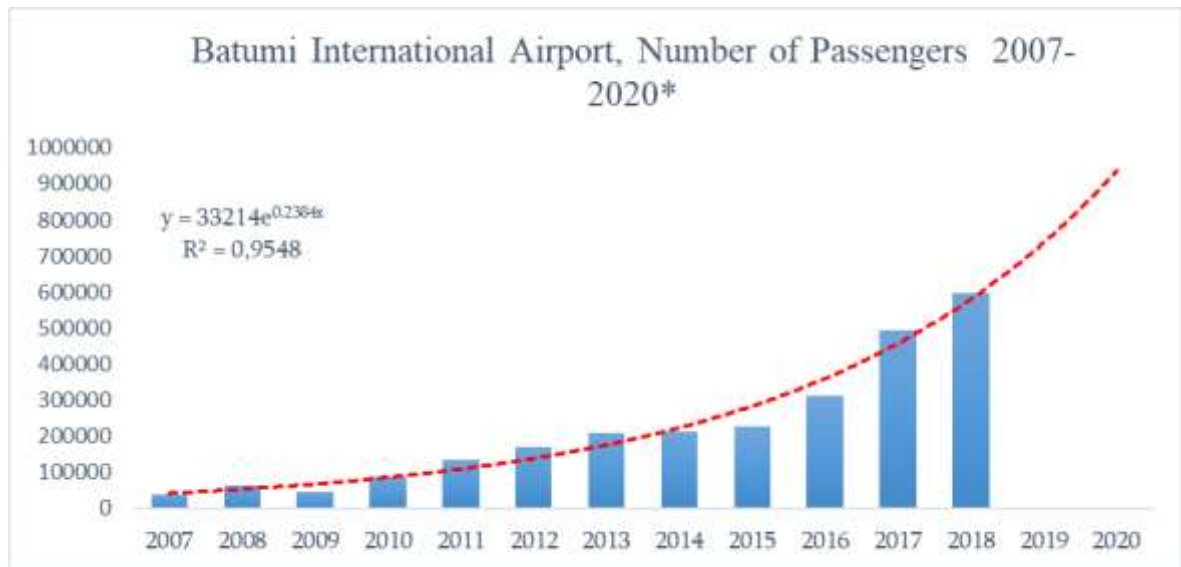
2. David the Builder Kutaisi International Airport – this airport is located near 3rd biggest city of Georgia, Kutaisi, in middle of Georgia, get popularity because of cheap flights

3. Shota Rustaveli Tbilisi International Airport – located near capital Tbilisi, biggest airport in Georgia with highest passenger flow, most important flight destinations are served from here.

Airports are very interesting indicator of developing of country, if country has international airports with good connection to the world and high passenger flow, it means that country is safe, attractive for tourists and or in process of high development or already developed, so because of this it's very interesting to analyse passenger flow in those 3 airports. After falling of Soviet regime and getting independence, Georgian airports were in bad conditions and by the time situation become worst without signs that it's will become better but, slightly after revolution in 2004, airports get new life, new hope with process of modernization, in the beginning of 2007 Tbilisi international airport was modernized to advanced standards, after this modernization went to the Batumi International Airport and finally, 2011 was started modernization of Kutaisi International airport what was done in 2012. Importance of Kutaisi International Airport is conditioned because of cheap flights to the Europe, from where European tourists can easily come to Georgia and Georgians can go to the Europe without problems, it's like getaway to Europe,

Airports helping to the countries economics by attracting tourists and by simplifying relations between countries (people) on **Chart 21** you will see how passenger flow increased in those 3 airports by the time of modernization and reopening and it will give you understanding why airport and passenger flow is important and good indicator of country's development.

Chart 21 Batumi International Airport, Number of Passengers 2007-2020*



Source: own calculation according data from Civil Aviation Agency of Georgia

As you can see, after modernization in 2007 passengers flow increased rapidly (50% after first year of modernization) in you can see decrease of flow, it's because of war with Russia but after 1 year stable growth continued till 2018 record year for Batumi International Airport, next **Chart 22** will show number of passengers in Kutaisi International Airport

Chart 22 Kutaisi International Airport, Number of Passengers 2007 – 2020*

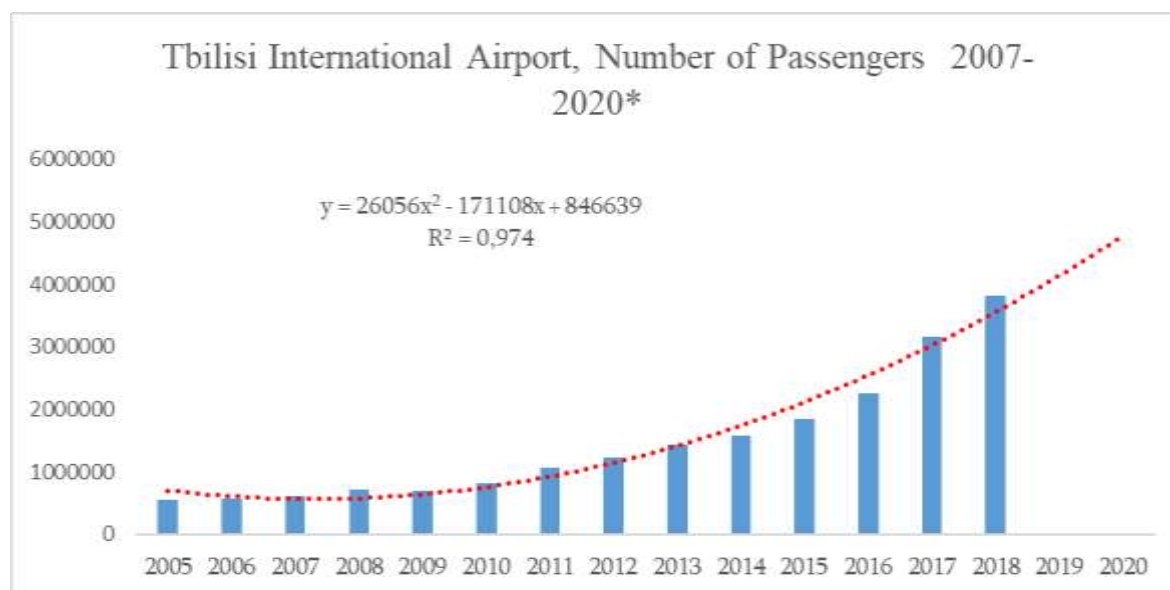


Source: own calculation according data from Civil Aviation Agency of Georgia

After 2012, when airport was reopened you can see yearly increase of passengers but big push for passenger flow was visa liberalization with European Union (EU), what give

possibility to citizens of 28 EU countries travel without visa in Georgia and same for Georgian to direction of EU.

Chart 23 Tbilisi International Airport, Number of Passengers 2007 – 2020*



Source: own calculation according data from Civil Aviation Agency of Georgia

Situation in Tbilisi International Airport was same as Batumi, in 2007 after modernization of airport and changing management, airport faced increased amount of passenger flow, in 2005 till 2006 increase was very little but after 2006 increase of passenger flow gained speed, here was little decrease after war with Russia but still, increase remained and finally after 2010 it's gained high speed and in 2018 Tbilisi International Airport served to 3.808.619 million passengers what is highest number to compare previous years and a specially 2005 or 2006, this 3 airports helping country to be diversified and give equal possibility to regions develop more autonomously.

4.3 Correlation Analysis

In this chapter I will use correlation analysis to find out relations between GDP, investment in roads and railway communication, foreign direct investment, electricity etc.

It's interesting to understand if there is some positive trend or negative between investment in the road infrastructure and GDP, for example in **Table 1** you can see correlation of GDP and Investments in the road and railway infrastructure, how you can see amount of investments in this sector is increasing by the year and probably till 2020 it's will go up to the 1 billiard and more because of the planned infrastructural projects and financial help from EU.

On **Table 1** you can see data from 2006 till 2017 for GDP of Georgia in USD and also investments in roads and railway in USD (changing of currency from GEL to USD according exchange rate on 24.03.2019) calculation of correlation between GDP of Georgia and Investments showed result 0.783 what in percentage will be 78.40% what means that growth of amount of investments in roads and railway and growth of GDP are positively related to together, so if trend will be same we will see more increased investments in transport infrastructure and more growth of GDP.

Why GDP is growing with increasing amount of investments in the road and railway infrastructure? One of the reasons of growing GDP in period when investments are increasing in this kind of infrastructure are first of all high amount of money what is needed for road or railway infrastructure, usually building of highways and railway roads are related to the high expenses, it's happening because of complexity of projects, a specially in Georgia where most of the territory are covered by mountains and rivers, in another hands road and railway infrastructure projects involving inside of project different sectors of economics, when infrastructural project is starting region or country facing increased demand on certain things, starting from accommodation of workforce in project area and ending with buying some expensive materials for construction of road in local market.

Table 1 Correlation between GDP and investment in road and railway infrastructure

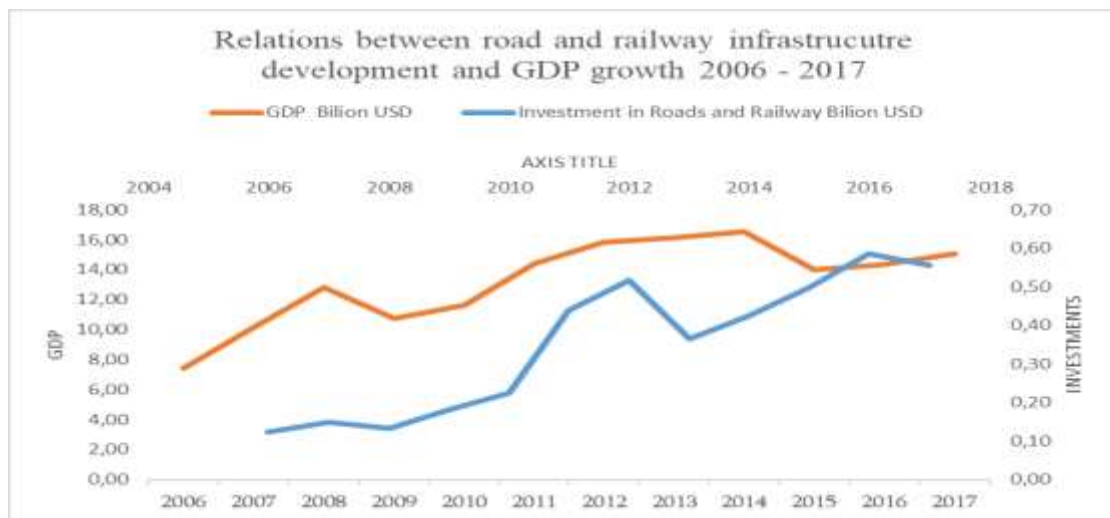
	Currency 2,68		Corellation Analysis		
	Year	GEL Million	Billion GEL	Investment in Roads and Railway Billion USD	GDP Billion USD
	2006	332,4	0,332	0,12	7,45
	2007	400,4	0,400	0,15	10,17
	2008	358,3	0,358	0,13	12,80
	2009	484,5	0,485	0,18	10,77
	2010	604,2	0,604	0,23	11,64
	2011	1172,5	1,173	0,44	14,44
	2012	1385,7	1,386	0,52	15,85
	2013	975,2	0,975	0,36	16,14
	2014	1139	1,139	0,43	16,51
	2015	1337,6	1,338	0,50	13,99
	2016	1571,3	1,571	0,59	14,38
	2017	1487,5	1,488	0,56	15,08
Correlation		USD Billion	GDP USD Billion		
		USD Billion	1		
		GDP USD Billion	0,78395998	1	
	Percentage	78%			

Source: own calculation according data from National Statistics Office of Georgia

In generally this type of projects activating economics of whole country and specially regions where project is going, it's haves positive effect in short term period by creating jobs, increasing demand on local regional products and after stable long term effect for whole country by increasing traffic on the highways (transit true country) helping to tourists to reach country, helping to local people with movement in to the regions, connecting markets, creating diversified demand and etc. due strategic location of Georgia on global map, place where Asia and Europe is connecting, Georgia needs good quality, long and safe highways from Azerbaijan till Turkey, name of one of the major highway in Georgia what haves global importance is "East-West Highway" what In the 2020-2021 will connect Azerbaijan, Georgia and Turkey by high speed international highway and from Turkey Georgia, Azerbaijan and Asian countries (landlocked) will get full connection to the Europe, it's will be bridge for Asia and Europe and Georgia will have important role to manage this bridge, approximately cost of the project is 600 million euros and length of the highway will be 185 KM, it's will involve not only Georgia but also neighbours in the region and countries more far from Caucasus.

Besides of this project there is some major projects in the cities, for example in the capital Tbilisi, project of prolongation of metro, in Batumi development of internal roads, internal roads in the city will support diversification of local market and economy, it's will help to the city grow inside not just on the coast side, benefits from this project will get local residents as well as investors who's planning to invest money in city Batumi.

Chart 24 Relations between road and railway infrastrucutre development and GDP growth 2006 – 2017



Source: own calculation according data from Civil Aviation Agency of Georgia

Roads and railway is important for infrastructure but there is one more very important part of infrastructure, electricity network, in **Tab 2** you can see correlation of GDP and electricity consumption per capita, I make observation that GDP growth and growth of electricity consumption has similar trend (movement), and by this example of correlation I wanted to make sure that they both, consumption and GDP growth they are moving in same direction, what was proved by correlation made by me in **Tab 2**, correlation showed 81% of similar direction of trend movement (positive, increasing trend)

Table 2 Relation between GDP growth and electricity consumption 1993 – 2014

	GDP of Georgia	Electricity consumption per capita	Correlation		
				GDP of Georgia	Electricity consumption
1993	2.633	1.936			
1994	2.461	1.978	GDP of Georgia	1	
1995	2.661	1.468	Electricity	0,818943778	1
1996	3.005	1.119	Percentage	82%	
1997	3.002	1.278			
1998	3.440	1.435			
1999	2.638	1.460			
2000	2.871	1.452			
2001	3.009	1.449			
2002	3.171	1.509			
2003	3.747	1.607			
2004	4.689	1.678			
2005	5.673	1.784			
2006	6.766	1.659			
2007	8.746	1.730			
2008	11.082	1.796			
2009	9.306	1.757			
2010	10.107	1.976			
2011	12.437	2.219			
2012	13.628	2.271			
2013	14.028	2.459			
2014	14.219	2.688			

Note: Data after 2014 not available Source: own calculations according data from World Bank

In reality consumption of electricity and GDP they are not directly related but, in specific situations like in Georgia it's possible to reveal relation, situation in Georgia is specific due some reasons, one of the reason is post-soviet period (stagnation and decrease of all features of economics) second reason is process of developing after revolution in 2004, after revolution increase of electricity consumption was stable to compare post-soviet period when it was unstable (sometimes increase, sometimes decrease), after war in 2008 country

went to the period, electricity consumption start increasing two times, sometimes 3 times more then before by 8 or 12% as you can see from **Table 3**.

Table 3 Electricity consumption and percentage change 1993 – 2014 (kWh per capita)

Year	Electricity consumption per capita	Percentage Change
1993	1.936	-
1994	1.978	2%
1995	1.468	-26%
1996	1.119	-24%
1997	1.278	14%
1998	1.435	12%
1999	1.460	2%
2000	1.452	-1%
2001	1.449	0%
2002	1.509	4%
2003	1.607	6%
2004	1.678	4%
2005	1.784	6%
2006	1.659	-7%
2007	1.730	4%
2008	1.796	4%
2009	1.757	-2%
2010	1.976	12%
2011	2.219	12%
2012	2.271	2%
2013	2.459	8%
2014	2.688	9%

Note: Data after 2014 not available Source: own calculations according data from World Bank

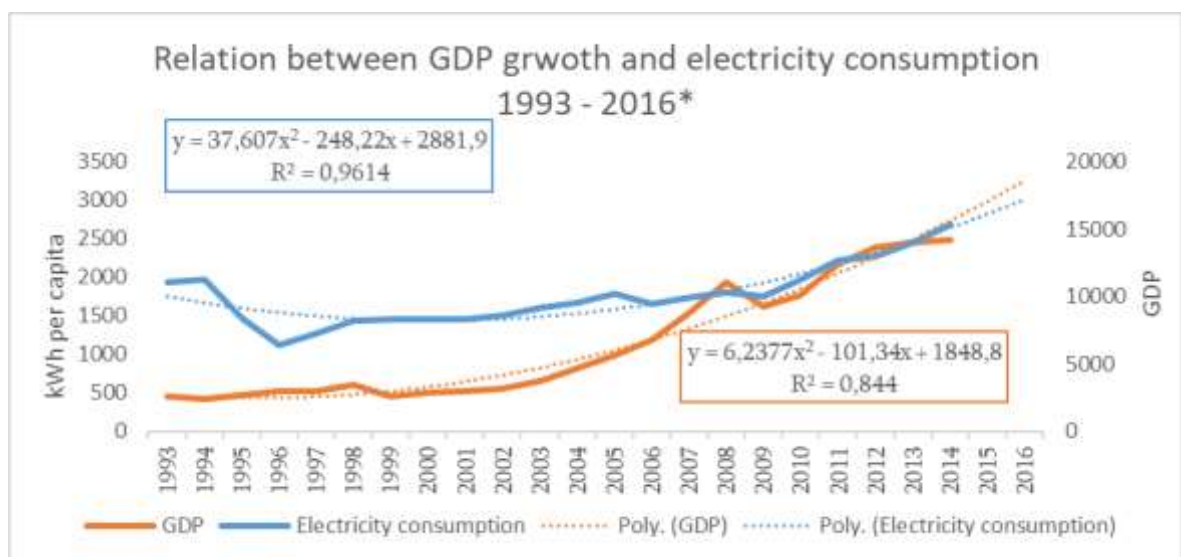
Electricity consumption is important indicator of growing economics, in developing countries where electricity consumption is not growing you can observe stagnation of economics, no improvement in electricity system, no increase in construction sector, no active movements what is notable for growing economics, increased consumption of electricity per capita means that households have more money to spend for electronic devices or to use more electricity, it's means that coverage of country by electricity is increasing and more regions, more settlements are connected to the network, business has more easy access to the electricity, actually Georgia in region and in the world according World Bank research has nice

position, it's takes from 1 to 2 days to get access to the network of electricity for household or business entity.

Increased amount of consumption of electricity shows that country becoming ready for industrialization or already went to the industrialization process what is very important moment and indicator for country's development, after sometimes when country will become developed or when country will be near to be developed, consumption electricity can decrease, probably it's will happen in near future in Georgia, it's happening because of improvisation of the electricity network by modernizing old lines, changes in way of production of electricity and changes in behavior of the population, process of decrease of electricity consumption in the developed country can be good process but for developing country it's bad signal, it's means that population becoming poorer, industries are not growing and etc.

In **Chart 24** you can see relation between GDP growth and electricity consumption, also on the chart you can see predicted consumption of electricity per capita and GDP growth, as you can see, they have similar way and growing tendency.

Chart 25 Relations between GDP growth and electricity consumption 1993 – 2020



Note: Data after 2014 not available Source: own calculations according data from World Bank

Next observation is very interesting, according my analysis CO2 emission and GDP growth are related to together, they have same trend of the movement what you can see on the Tab 4, there is positive correlation 91% that trends are going in same direction what can mean that if in Georgia CO2 emission will growth it's will means that GDP also will grow till country will not become full industrialized and development, after development process

ideally CO2 emission growth should stop and needs to start decrease due improving policy, law and environmental care.

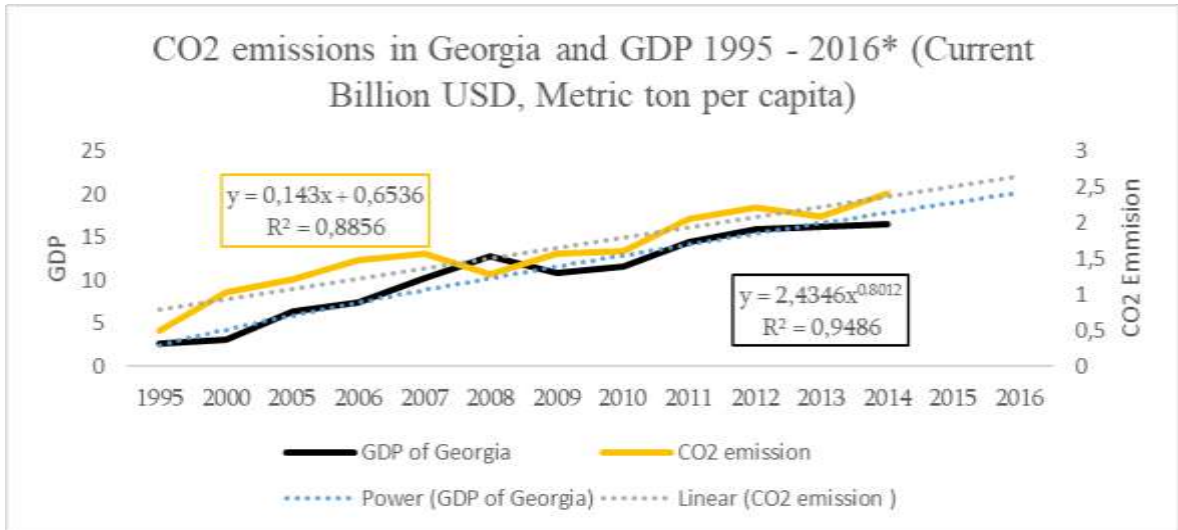
Table 4 CO2 emissions in Georgia and GDP 1995 – 2014 (Current Billion USD, Metric ton per capita)

Year	GDP of Georgia	CO2	Correlation	
			GDP	CO2
1995	2,69	0,49		
2000	3,06	1,03	GDP	1
2005	6,41	1,21	CO2	0,9149614
2006	7,45	1,49		91%
2007	10,17	1,57		
2008	12,80	1,28		
2009	10,77	1,57		
2010	11,64	1,61		
2011	14,44	2,06		
2012	15,85	2,21		
2013	16,14	2,08		
2014	16,51	2,41		

Note: Data after 2014 not available Source: own calculations according data from World Bank

In developing process due intensive construction projects, industrialization and income increase (income increase in developing countries usually means that household or person has possibility to buy new car) CO2 emission is growing, it is why it's important to make observation of CO2 growth, the beginning of 90s in Georgia CO2 emission was 6,39 metric ton per capita but in the 1995 it's become 0,49, one reason why in the beginning of the independence CO2 emissions was very high it's that Georgia in Soviet era was high industrialized country with well-developed manufacture but after soviet union fall there was no possibility any more to sell product because there was no more market, because of that reason factories were closed and sold in different countries, actually nowadays it is one of the reasons why Georgia is undeveloped, so after decreasing of industrialization level CO2 emissions went down naturally till historical minimum 0,49 metric ton per capita but after Rose Revolution he start growing again, annually 4% per year what means that industrialization process restarted in the country and stagnation period was left back to the past. **Chart 26** shows growth of GDP and CO2 and how they are related to together.

Chart 26 CO2 emission in Georgia and GDP 1995 – 2016* (Current Billion USD, metric ton per capita)



Note: Data after 2014 not available

Source: own calculations according data from World Bank

5 Results and Discussion

5.1 Results

In this presented study, the importance of infrastructure was explained, showing results and ideas of how it is possible to develop country, and how to change situation from stagnation and stocked economy to active and developing one. In doing analysis time series have an important role. Most of the part of time series were taken from Georgian Statistical Office and World Bank, and according to the it was possible to add on graphs a trend line. Trend line is very useful to understand future development of infrastructure, GDP growth, etc. According this it is shown how economic of Georgia will develop in future, and what to wait 5 years on if there will be not to critical changes (war or crisis).

In data analysing process it was found out that CO₂ emissions growth and GDP growth have similar trend- they are growing by 91% in similar direction. In most cases people would say that it is very bad that CO₂ emission is growing, but in this case, it is interesting to observe and to understand the process of industrialization. Developed countries did this way 2-3 centuries ago, when industrialization era started, with inventing engine and electricity, but for countries like Georgia, which was occupied and was member of Soviet Union by force, industrialization process went in bad direction, not incompatible for global economy. It is essential to mention that soviet economy was different from global economy; instead of being oriented to competition and foreign trade as the other country's economy, Soviet countries economy was oriented on quantity and not quality. And of course, after Soviet Union fall, the existing manufacturing industries did not success, since they were not ready for competition on global market, and local demand was not enough to survive.

CO₂ emission in Georgia, in the beginning of 90's, decreased 5 and more times. In normal case people needs to be happy about decreasing amount of CO₂ emission, but in this case, this decrease was not because of improvement in environmental policy or technological progress, but because of stagnation of the county's economics, when it began a crisis period, when half of the population was hungry and suffering from lake of finances, there was no job opportunities and salary was miserable.

With decrease of CO₂ emission, GDP also was decreased, but by the time till 2004 GDP and CO₂ emissions changed in positive direction little bit, although these changes were not sufficient. There were very little movements without real effect. In fact, real effects were seen after revolution, when in 2004 GDP started growing 2 and 3 times faster, as well as CO₂.

With CO₂ increase, people could react in negative way, but in this case we can say that the environment and people can endure for few years this increasing amount of CO₂, before country will become developed. Afterwards it would proceed to decrease CO₂ emission and take care more about nature and the environment. It is very important to realize that developing countries without industrialization (what means increase of CO₂), development process will not happen, so main idea of this observation is to show how one bad trend for some country can be good trend for another ones in process of developing, and how we can recognize stagnation or dynamic movements in economics.

Another important observation made is that growing consumption of electricity is related to the GDP growth. In Georgia, in the beginning of 90's, there was a slightly decrease in consumption of electricity. After few years, consumption started to increase, but it was very unstable, with increasing and decreasing trends, what means that in this period growth of consumption of electricity was chaotic and not normal. After 2004, where it can be seen little chaos in consumption of electricity, can be explained because of modernization period of electricity lines, infrastructure and so on. Electricity system was out of date and needed to be modernized, and after modernization, Georgia faced another problem, the war with Russia, but after war it got little stabilization.

From 2009 electricity consumption started growing by 8 and 12% yearly, what is very positive trend. It means that households and enterprises started consuming electricity, and electricity network had enough power to endure demand. Increase of electricity consumption, as well as emission of CO₂, means that industrialization process is started, people are consuming more, income is increasing, and in future it is expected more increase and more development of business.

From correlation done in this research, it can be observed that GDP and electricity consumption trend movements are related to together by 81%, but in case of another countries it can be even higher, so we can conclude that network of electricity is developed and ready to support process of development. Development of country is not possible without properly working electricity network- before revolution, development of country was not possible due reason of undeveloped network of electricity and instability of the country.

On the other hand, correlation between GDP and investments in road and railway infrastructure showed positive trend. GDP and transport infrastructure are positive related by 78%, what is good number, but in future it can be even better due to increase the spending in transport infrastructure and acceleration of GDP growth. In this case, we have direct and indirect effect on economics (GDP); from direct effects we can say that infrastructural

projects are attracting high amount of money, what goes directly to the economics. It is like injection of adrenalin for human, positive acceleration noticed immediately but after, if infrastructural project is successful, it will have long-term direct effect in the transport infrastructure. About this it can be said that transport infrastructure supports the idea of inclusive economics, what means that all regions of country are equally involved in economic activity. To get this equality, there is big need of good transportation, access to the roads and railway, and traveling time needs to be minim to make money more liquid and markets more accessible. So increased traffic and connection between markets help to the region with developing process, getting benefits and involving it in the global processes.

About indirect effect, it means an increase of demand on the local goods, products, accommodation, increase of employment level, development of the business and development of the better services for the people. But in case of correlation, it was more important to understand direct effect of the investment of the money in economics, now that they can accelerate economics and support GDP with growing, as it could be seen in Chart 23. When money is injected in economics it needs time to have effect- it can be from 6 months to one year, or even more. In this case, effect of investment has a positive correlation, and observing the growth, it shows how is important can be the road infrastructure and railway communication. In cases of well working, the first thing it will be developed in the country is roads, as Georgian government did in 2004 after changes of old government.

Finally, time series analyse about passenger flow in airports in Georgia provides additional information about this country's developing process. Increased passenger flow means that country is safe for traveling, people have interests, developing level is higher than before, and quality of services is increasing. On another hand, increased amount of tourists and transit visits means increased amount of money in economics of country, more development, and increase of popularity, what will involve more people in tourism, diversification of economics, more jobs and benefits from globalisation. So in Chart 21, 22, 23 it can be seen how, year by year, it is increasing the passenger flow in the 3 main airports of Georgia. Considering GDP growth, GDP growth and passenger flow are related together, and GDP and passenger flow will increase in future, one of the components or both. This means stability, that means growth, and at the same time more development and satisfied population, so passenger flow in airports are important indicator of development of country

5.1.1 Discussion

There are many indicators and possibilities to compare or illustrate economics. Different authors use different methods and strategies, but finally, the main idea and questions are kind of same. It can be said that every author is trying to get an answer on most important question: how we can increase speed of development of country and decrease poverty to give better life to the people. In the article “Assessing The Impact of Infrastructure on Economic Growth and Global Competitiveness” (2005), author Tatyana Palei says: “the low level of institutional development makes investment highly risky and, therefore, ineffective”. This argument was proved in this thesis by analysing the Georgian soft infrastructure, hard infrastructure and processes after revolution. For example, part of the reform after revolution was “war against corruption”; corruption existed in Georgia in every governmental structure, reason why government announced restructuration of all ministries, police, army and vital structures of the government. In the beginning of 2005, all employees of policy departments were fired, and it was opened a new police academy in order to increase professionalism of policemen. Another strategy of government in fighting against corruption included increase of salaries and giving additional benefits to employees, like insurance, growing opportunity, modern offices, accessories and car parks, to serve people in any place, in any weather conditions. The same way of reformation touched army, state security service, health care and all ministries. As a result of this, it was increased the trust of people in government, the quality of services, foreign direct investments in the country, record growth 12% of GDP, etc.

In the book “Impact of Wastewater on Surface Water Quality in Developing Countries: A Case Study of South Africa” (2016), author Edokpayi, Odiyola et. al. argue that in many rural areas worldwide, water from freshwater sources is used for irrigation purposes by farmers, for fishing by fishermen, as well as for swimming and serves as centres for tourist attraction. Surface water, therefore, should be protected from pollution to protect human life and increase benefits from water. In case of Georgian government, after revolution, it started, step by step, to change infrastructure of water supply network, from old pipelines to modernization or implementation of water treatment system. In thesis it is used case of Batumi as example, but same approach is still working in all territory of Georgia. Process of modernization is going in companion of development of new green policy of country, in order to protect the environment. In case of Batumi, treatment of water was very important because of the location near Black Sea and its touristic potential. But as Edokpayi and Odiyola (2016) say, rural areas are still out of water treatment system (in Georgia and also in developing

countries) and it needs to be improved. With this improvement, touristic potential will increase, quality of products and life will be better, and economics will work better; so it can be said that Georgian government chose the correct way of development in the beginning of 2007, when they started modernization of outdated water supply system.

In article “Trade Policy in Landlocked Countries” (2019), Peter Warr argues that landlocked country has little choice about the transit of goods, and land transport charges are sometimes subject to monopoly pricing within the adjacent countries. In the process of analysing the economy of Georgia and the strategy of the country, it is shown that Georgian government chose strategy of leadership in region, meaning with region not only Caucasus area, what includes inside 2 landlocked countries (Armenia, Azerbaijan), but also further countries, like landlocked Kazakhstan, Turkmenistan, etc. The aim of Georgian government transport policy is to connect those countries to the European market and global world by using transport corridor in Georgia. In this corridor it will be involved new international highway, international railway communication from Georgia to Turkey, Black Sea ports and airports, so Georgia will get leadership in region and will support landlocked countries with transportation. In many cases, countries with access to the sea use to take advantage manipulating their neighbours, but in case of Georgia, it tries to involve this big region in economic activities, so both sides get benefits, and the countries around will be protected from manipulation of another countries like Russia, Iran or others, who usually use monopoly in region as trigger to manipulate decisions of neighbour countries. So, it can be said that Georgian transportation policy is a very important policy for this century to change picture in Asia and Europe as well.

6 Conclusion

Infrastructure in developing countries can be changed, and it will change, but the question is- when? The most important matter in developing process is time; developing process affects people, and if this positive effect acquires fast, society would be happier, as well as the next generations in future. The final idea of economic development is to support happiness of people, to give them life. Besides of numbers, there are a lot of human lives that deserve to be remembered. If time of development decreases, and happiness increases, it will mean that something big and good has happened in the world.

Some examples are the transformation process happened in Georgia, which reached significant development; the process of developing in the Czech Republic; and transformation of another developing countries. Ecological policies, infrastructural policies, etc. can support this process of development- proper transportation policy can increase quantity of visitors and communication between regions in the country or increase level of industrialization.

Industrialization and development of tourism means more jobs for citizens, more jobs mean more income, etc. Developing countries should take recommendations from developed countries, specially taking into account the importance of development of the infrastructure.

According the analysis showed on this thesis, every project that causes changes in the nature of infrastructure can affect GDP, like highways, railway, airport modernization, water and gas supply network, electricity network. All this have direct or indirect effect on GDP of a country, as it is shown in the analysis of the relationship between roads and railways, where CO₂ increases because of the industrialization or the increase in construction sector; the same happens with electricity consumption and GDP, where there is a positive trend between growth of GDP and this 3 elements. A comparison between growth passenger flow in airports and GDP also showed positive trend and increase of GDP. These provided examples give a very nice understanding of how economics is working in real life, as is the case of development in city Batumi. Changes in underground infrastructure and, after modernization of roads, electricity and water treatment system, shows that if country or city develops basic infrastructure, then there will be possibility to develop more advanced infrastructure. So it can be said that basic infrastructure will support life of people and their basic needs, but advanced infrastructure will help country to become developed and economically strong.

Rose revolution showed to post-soviet countries, not only that development in the short-term period it's possible, but also that it is possible to archive positive goals, defeat corruption, increase quality of services, increase quality of the infrastructure and develop new,

connect little country to the global society, become number 2 in doing business, and even increase freedom of economy.

In example of Georgia it is easily visible the sustainable development and goals. New policy of Georgian government, the “Green Economy”, is one of the examples of how this country is transforming from basic needs to the advanced needs and economy, with development and modernization of sewage system, and control of consumption of the plastic bags. This policy of recycling trash, which will be implemented in 2019, is an experimental policy of green, renewable energy (wind, water, solar), but it is, at the same time, an example for another developing countries. If 7-8 years ago people in Georgia never had thought about this, today more and more people are involved in process of sustainable development- people are making protests movements, asking government to be more carefully with nature, and as last step in this process, asking the implementation of the urban development plan in every city or region on this country, now that it is known how it will help to the city to be more sustainable and eco-friendly, and developed according needs of population, and not only investors.

In another example of development of Czech economy, it is interesting the approach and the way how they did process of development. It is a significant example and lesson for the government of developing countries because of speed how it became a developed country. Support of the investments, industrialization, high tech production, privatization of the state property, intensive trading with neighbour countries and development of the good transport connection with them, and changes in economy after Soviet era, caused a fast growing of GDP and the lowest unemployment in Europe. All this needs to be inspiration for another population and society, supporting the government to change their policies for the improvement of their people, and for global society. If landlocked Czech Republic can have strong economy, why other countries cannot? Why not try to be leader, best, why not help to the people?

Protest movement in Armenia and changes in government give hope to the Caucasus region, what in future will become stronger and development process will be equal.

According to the research, those countries should be, in the beginning, more concentrated in corruption and soft infrastructure, like governmental services and ministries, and after start with the development of hard infrastructure. Without this, it won't be possible to develop proper infrastructure with high quality. After that, it is also remarkable the improvement of communication with neighbours, what will support economics of whole region. Development of the new railway to the Turkey from Georgia, and development of

East–West Highway are key projects, and in future, and they will be key element for the development of those countries in the Caucasian region. Better cooperation will support development of infrastructure, and this improvement in region will help to everybody be happy, be advanced, with modern infrastructure that allows the enjoyment of high life standards, and long life in peace.

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