

Industrialization or knowledge economy strategy of the sustainable development in Ukraine

Sergii Voitko¹, Mariia Kokoruz²

Abstract. The study focuses upon industrialization processes, as exemplified with the help of newly industrialized countries, and its influence over the environment. It investigates into the necessity of knowledge economics, the principles of which may be used in the economy structuring process, meeting the requirements of the sustainable development pillars.

Index Terms: newly industrialized countries, sustainable development, Kyoto protocol, knowledge economics, information technologies.

JEL: L16, D83, Q01

I. INTRODUCTION

Imbalances in the world economy under the conditions of a lingering global economic crisis cause a need in developing and realization of innovative approaches to reforms and structural transformations, which would provide a solid base for the long-term economic growth of a country.

To establish an innovative base plays an important role at the moment in Ukraine, when the country's own strategy for development is under consideration. Hence, the research work, investigating into the possible ways of restructuring of the national economy in the crisis situation is relevant. We aim at investigating into the possible ways of economy transformation from the raw-processing type (coal, metals) to the economy, bases on the principles of knowledge. International economics is filled with examples of economic growth.

Currently, newly industrialized countries serve as an outstanding phenomenon: they have reached high rates of growth in less than half of a century. Results of their performance stimulate the exchange of their experience in those countries, the economies of which require changes and restructuring, in order to provide a sustainable economic growth and create decent conditions for the society.

Object of a research is the realization of achievements of the effective development in the newly industrialized countries, aimed at implementation of these achievements in the national economy. Quantitative analysis of data, systemic and complex approaches have been employed in the study. Sources of information include the official data from the World Bank, United Nations Framework Convention on Climate Change and World Economic Forum, the works of (Dominique Foray, 2004), (Leonardo Masai, 2011) and (Pavel Bozhyk, 2006).

II. PECULIARITIES OF THE PRESENT STATE DEVELOPMENT OF THE “NEWLY INDUSTRIALIZED COUNTRIES”

Experience of foreign countries is one of the factors playing a leading role in developing a strategy of a country's economic growth. In the current context, when crisis has become an inherent part of the everyday life, Ukraine is situated on the crossroads of radical changes: implementation of reforms and structural transformation may lead to forming of a relatively new base for the economic growth.

International arena has witnessed a lot of cases of economic upturns and downturns, which have been characteristic for countries at some stages of their development. One of the bright examples of such a growth is the group of newly industrialized countries (NIC). Due to their rapid economic growth, they have been attracting attention of the scientists since the second half of the XX century. Transition to a new level, with which the NIC countries can be characterized, is a necessity for Ukraine. Hence, experience of their development can serve as fundamental when forming Ukraine's own strategy.

Foreign scientists, such as P. Bozhyk (Bozhyk P., 2006) define a range of countries, which belong to the group of NIC. The list comprises China, India, Thailand, Malaysia, Philippines, Indonesia, South Africa, Turkey, Brazil and Mexico. Each of the countries is illustrates economic upturn, which is mainly projected through the positive dynamics of their GDPs.

As it can be seen from the figure 1, during 1992-2014 the ratio of GDP per capita grew significantly, regardless the slump in 2009 as a response to the world financial crisis in 2008. With the help of a trend-line, we can observe, how since 2002 an upward trend in the GDP per capita in these countries has developed. Comparatively, rates of change in the GDP per capita in Ukraine (which, according to the

¹ Sergii Voitko is a Professor at the International Economics Department, National Technical University of Ukraine “Kyiv Polytechnic Institute”, Kyiv 03056, Peremohy Ave 37, Ukraine.

² Mariia Kokoruz is a Master Student at the International Economics Department, National Technical University of Ukraine “Kyiv Polytechnic Institute”, Kyiv 03056, Peremohy Ave 37, Ukraine.

official World Bank data, has been bigger than the amount of the GDP per capita in Philippines for the last two decades) is heterogeneous.

At the time, when NIC are facing a substantial upward trend in their growth, Ukraine is experiencing a period of decline, which is demonstrated with the help of fluctuations in the GDP per capita.

Amid the countries in question, Ukraine has faced the sharpest decline in the GDP per capita – 23.5% in 2015 comparing to the previous year. In the meanwhile, change in the GDP per capita in the newly industrialized countries, is fluctuating from a slight drop of 4.1% in Turkey to a substantial rise of 17.2% in Brazil. However, such kind of improvement is not completely poses advantage.

Repercussions of the economic growth in the newly industrialized countries are negatively projected onto the environment. Forced industrialization, dramatic boom in manufacturing of goods leads to the increase in the emission of industrial waste into the atmosphere. Carbon dioxide emissions are the most frequent, they cause the greenhouse effect to appear, which in its turn, leads to the increase in the air temperature in general.

III. EFFECTS OF INDUSTRIALIZATION AND THEIR IMPLICATIONS IN THE ENVIRONMENT.

Atmosphere is a good of mankind as of right. To prevent the negative impact on the atmosphere is the most important task of every country, which since the 1990s has become one of the most relevant tasks in the agenda of international cooperation. World society pays more attention to the current state of the environment and possible ecological implications, the performance of industrial countries may lead to. One of the cruellest enemies of the environment is the greenhouse gases, which are brought about by the anthropogenic activities. These gases are adding up to the creation of the global warming on the planet. Preventing the development of the global warming and eradicating its repercussions is of a high importance, especially within the framework of the sustainable development, a concept which is currently the leading objective of the modern society.

The UNFCCC (United Nations Framework Convention on Climate Change) – international treaty which was negotiated in 1992, aims at stabilizing the concentration of greenhouse gases at a level, that does not cause a harmful anthropogenic influence over the climate system. In 1997, the Kyoto Protocol was adopted, and it entered into force in 2005. The protocol binds developed countries and those with transition economy to cut down on and to stabilize the emissions of greenhouse gases during 2008-2012 at the level of 1990. The treaty was signed by 187 countries in the world, and the newly industrialized countries also participated (UNFCCC, 2015).

By employing the official statistic data, published by World Bank (World Bank, 2015), it is possible to analyze the dynamics of change in the amount of greenhouse gases

emissions during the scope of 20 years: from 1992 (when the UNFCCC was signed) till 2012 (the expiration of the first commitment period of the Kyoto protocol). By the end of 2011, the group of newly industrialized countries was among the largest producers of carbon dioxide in the world, as the percentage of emissions amounted up to 40% of the total emissions recorded. Remarkably, China alone produced more that 26% of carbon dioxide emissions. In the meanwhile, besides the newly industrialized countries, percentages of the emissions in the US, EU-27, Japan and Russian Federation were also significant. Hence, a rapid socioeconomic development, by which the newly industrialized countries are classified into a specific group of countries in the international arena, is directly causing a negative impact over the environment.

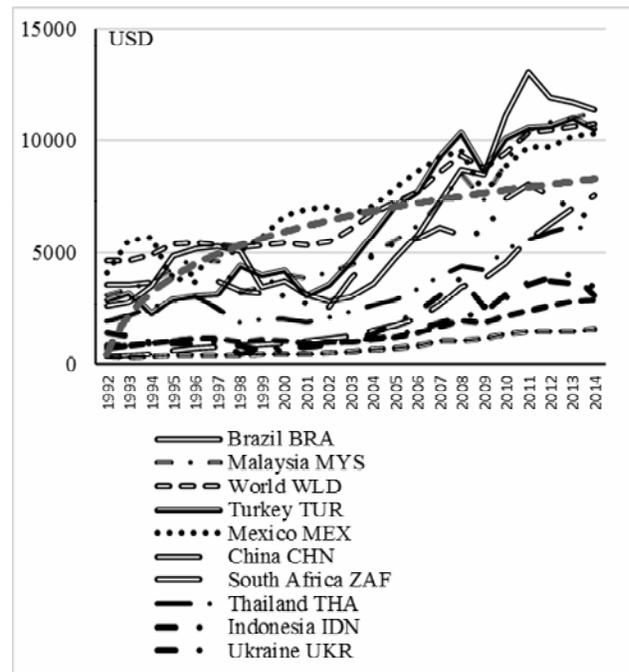


Fig. 1. Dynamics of the GDP in the group of newly industrialized countries and Ukraine, 1992-2012*

Source: own representation

Within the period of 20 years, from 1992 till 2002, the amount of carbon dioxide emissions tripled in Malaysia, Indonesia, India and Thailand, whereas in Brazil and Turkey the percentage doubled. Mexico, South Africa and Philippines faced the negative for the environment positive growth of approximately 1.5 times. Industry in China, where the economy represents a high speed of growth during last decades, can be characterized with a dramatic increase of carbon dioxide emissions, which was equal to 3.5 times. By large, total amount of the emission in the world increased gradually by 1.5 times by the end of 2011, as comparing to 1992. The calculation proves the negative impact of the environment the industrial countries are causing.

Objectives of the Kyoto protocol, ratified in all of the newly industrialized countries, were not meet: in every

country in the group, the amount of the carbon dioxide emissions (which is the most frequently produced one among all the greenhouse gases) into the atmosphere exceeded the level of 1990, which was contrary to the conditions set by the agreement (Massai, 2011).

Such an increase in the carbon dioxide emissions into the environment has been accompanied with the alongside increase in the fuel fossils energy consumption: in every newly industrialized country, the percentage of it has grown during the two decades. According to the data, officially provided by the World Bank (World Bank, 2015) one can observe the linear interdependence: the increase in the fossil fuel consumption leads to the increase in the carbon dioxide emissions into the atmosphere.

At the time, when the world is desperately searching for the alternative ways of energy production – “a philosopher’s stone”, that will not only extend the duration of planet’s resources usage, but also will not lead to the pollution of the environment, the situation in newly industrialized countries might be alarming.

Accordingly, for the country, which policies’ meet the requirements of the Kyoto protocol, development strategy based on the intensive industrialization contradicts the high standards of a healthy society with a quality life - the core of sustainable development paradigm.

IV. IMPLEMENTATION OF THE KNOWLEDGE ECONOMICS INTO THE COUNTRY’S DEVELOPMENT STRATEGY

Having adopted the Kyoto protocol in 2004, Ukraine belongs to the countries, which have reduced the carbon dioxide emissions by 2012. According to the results on the emissions estimated, in 2009 the amount of carbon dioxide emissions in Ukraine dropped by 62.7 % comparing to 1990 (Massai, 2015).

November 2015 is officially a beginning of a new stage of reducing the greenhouse effect. Summit in Paris in November 2015 – conference of the member-countries of the UN regarding the climate change – was about reduction of the carbon dioxide emissions into the atmosphere as a result of less fuel fossil energy combustion (UNFCC, 2015). Currently, the agreement implementation is at its preliminary stage, signing of the agreement is scheduled to April 2016, and it is bound to come into force only if 55 countries, producing no less than 55% of the greenhouse gases in the world sign it.

Ukrainian government’s determination to carry out the economic activity meeting the requirements of the sustainable development implies little harm to the environment. This is diametrically opposite condition, which harness the realization of forced industrialization according to the newly industrialized countries’ scenario. Hence, the need for alternative ways of crisis recovery, different from those ones, implemented in the newly industrialized countries, and a shift-over to a new quality level of societal development, is very topical.

At the time, when innovation and technology are an integral part of any sphere of social life, focus on implementation and usage of technologies is reasonably justified, when the long-term growth is considered.

One of the mechanisms to implement in the development strategy is the knowledge economics, a relatively new concept, which aims at creating a highly-technological information society. Such a model of economic growth, comparing to the model of industrial development, is characterized with a less impact over the environment and meets the requirements of regulation of the greenhouse effect creation, as it does not imply the fossil fuel energy usage in an environment-harmful amount.

Nowadays, knowledge economics is a key paradigm of the progress in the societal development. Employment of knowledge as a factor for economic growth and increase in production volumes, intellectualization of structural processes, usage of high-tech software (for instance, information communication technologies), innovations etc. are necessary elements, characterizing the essence of knowledge economics as realized into practice. Application of its principles in management systems of micro-, mezz-, and macro-levels is a first priority task (Foray, 2000).

Market of information-communication services may serve as a bright example for that: analysis of the data, published by the World Economic Forum proves that the newly industrialized countries do not possess the reputation of those taking up leading positions in innovation and technology ratings in the world. Situation in Ukraine is similar.

Overview of the information-communication technology market in 2015, performed by the World Economic Forum, provides detailed information on the information-communication technologies in the majority countries in the world. According to the Global Information Technology report (World Economic Forum, 2015) the level of education in Ukraine is one of the highest in the world, as the country holds the 8th position in the ranking list. The quality of educational training of ICT specialists ranks at the 30th position. It is worth paying attention, that the Ukrainian government does not stimulate the usage of ICT in the working process: by estimation, with the usage of ICT in the working process Ukraine holds the 136th position in the rating, and by the level of successful promotion of ICT in the society – place 115th. The radar diagram provides detailed information on the specific indicators, which were investigated into in the report. Indicators are heterogeneous: on the contrary to the newly industrialized countries, Ukraine has high level of education, literacy of the population, which might serve as a basis for further development. Yet, neither the indicators characterizing political environment, nor the indicators on the usage of ICT in businesses or the economic impact of ICT, are not one of the highest.

Malaysia has the best system of ICT among the newly industrialized countries, whereas the ICT sphere in India is at a far lower level. Chart 1 represents the change in the integral rating on the ICT network readiness in a country.

Ukraine, as compared to the NIC, is situated in the middle Ppines and South Africa in terms of innovation and technology in the ICT.

Source: own representation

Such attention to the information-communication technologies is caused mainly by the expansion of the ICT dimension, which includes not only the Internet and communication services, but also provides characteristics for the unified technologies, e.g. information technology (IT).

Unlike other components of the ICT sphere, informational technologies in Ukraine, is a significant achievement that proves to have a considerable influence over the development of the country over the last 10 years. Ukraine is among the Top-5 countries in the world, which are providing high quality freelance IT-services. In terms of the number of certified IT-specialists, Ukraine belongs to the top 10 countries in the world. Speaking about outsourcing IT services, Ukraine is amid top-30. Remarkably, in the list of Top-100 highly technological countries to outsource the IT services, Ukraine has been awarded the 11th place.

Analytic investigation into the official data, published by the National Bank of Ukraine, illustrates that the export of IT services had grown from 2005 till 2014 by 35.37 times (according to the balance of payments), from 42 million USD in 2004 up to 1.5 billion USD in 2015.

The IT market in Ukraine can be characterized with a rapid growth and upturn: by calculation, gross share of IT services in the GDP of Ukraine in 2015 amounted up to 2%. Currently, there are 73517 IT projects taking place in the country. Overview of the market states that such cities as Kyiv, Kharkiv and Lviv are those with the highest concentration of IT companies, the total number of which amounts to 384 (Antonyuk, 2015). Taking all the above into consideration, we can conclude that the high quality preparation of IT specialists is necessary, as it can form a base for the successful realization of principles of the knowledge economics in future.

Therefore, directing special attention towards the IT sphere can play a crucial role in further development of the country. Highly intellectual work in the IT field is a realization of the knowledge economics in practice. With the increase in the percentage of IT services, market expansion and multi-dimensional support of the favorable climate for the IT-market functioning, the investment, technological and innovative platform for the potential long-term growth can be formed.

CONCLUSIONS

On the basis of the research conducted, it has been concluded that the experience of foreign countries plays an important role, when the problem of recovery from a lingering crisis appears. As exemplified with the newly

of the list, outstripping India, Brazil, Mexico, Philo industrialized countries, have been illustrating a rapid increase in their socioeconomic development, we have justified that the development strategy based on the industrialization of country's economy is contradictory to the principles of sustainable development, as it can lead to the environment-harmful activities. Taking into account the worldwide concern about negative implication of anthropogenic activities over the environment, further orientation towards industrialization as a priority in the development strategy is ambiguous, for it may lead to the considerable increase in the amount of greenhouse gas emissions, especially of the carbon dioxide emissions, harness reaching the objectives to reduce the greenhouse effects – the main task in the agenda of the world society.

By large, the modernity is rightfully featured with the integration of technology and innovation into every sphere of everyday life. A deep investigation of the highly intellectual development on the basis of knowledge economics can serve as a key to solving the problem in question. Ukraine is amid the leaders in the market of IT services. Therefore, to provide a favorable environment for the market development, aiming at its prioritizing, can serve as a positive scenario, the crisis recovery strategy may be directed to.

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